



# Hydropower Sustainability Assessment Protocol

Official Assessment

Keeyask Hydropower Limited Partnership

Keeyask

Canada

Lead Assessor: Dr Bernt Rydgren

Final



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**Assessment Date:** 10/12/2012

**Project stage:** Preparation

**Project size:** 695 MW

**Project type:** Storage

**Cover page photo:** Gull Rapids during winter, looking east towards Stephens Lake.

# Acronyms

<b>Acronym</b>	<b>Full Text</b>
AANDC	Aboriginal Affairs and Northern Development Canada
AEA	Adverse Effects Agreement
AIP	Agreement-in-Principle
AHC	Allied Hydro Council (a council of unions)
AMHSSE	Association of Manitoba Hydro Staff and Supervisory Employees
ATK	Aboriginal Traditional Knowledge
BNA	Burntwood Nelson Agreement
CAD	Canadian Dollar
CDA	Canadian Dam Association
CEAA	Canadian Environmental Assessment Agency
CEC	Clean Environment Commission
CNP	Cree Nations Partners (a joint business co-operation entity made up of TCN and WLFN)
CRD	Churchill River Diversion
CUPE	Canadian Union of Public Employees
DFO	Fisheries and Oceans Canada
DNC	Directly-Negotiated Contract
DO	Dissolved Oxygen
DSM	Demand-Side Management
DSR	Dam Safety Review
EAR	Environmental Assessment Report
ECT	EIS Coordination Team
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMPP	Environmental Monitoring and Protection Plan
EmePP	Emergency Preparedness Plans
EPP	Environmental Protection Plan
ENGO	Environmental Non-Governmental Organisation
FLCN	Fox Lake Cree Nation
FSL	Full Supply Level
GHG	Green-House Gasses
GS	Generating Station
HGD	Harmonized Gillam Development
HHRA	Human Health Risk Assessment
HNTEI	Hydro Northern Training and Employment Initiative

HRB	Manitoba Historic Resources Branch
HRPP	Heritage Resources Protection Plan
H&S	Health and Safety
HSEH	Health, Safety and Environment Handbook
HVDC	High-Voltage Direct-Current
IBEW	International Brotherhood of Electrical Workers
ILO	International Labour Organisation
ISO	International Organization for Standardization
IPCC	Inter-governmental Panel on Climate Change
IWRM	Integrated Water Resources Management
JKDA	Joint Keeyask Development Agreement
JSP	Joint Studies Program
KCN	Keeyask Cree Nations
KGP	Keeyask Generation Project (includes the KGS and other infrastructure at the power-plant site)
KGS	Keeyask Generating Station
KHLP	Keeyask Hydropower Limited Partnership
KIP	Keeyask Infrastructure Project
KPIP	Keeyask Project Implementation Plan
KTP	Keeyask Transmission Project
LGD	Local Government District
LWR	Lake Winnipeg Regulation
MAC	Monitoring Advisory Committee
MACBA	Multiple-Account Cost-Benefit Analysis
MANAACU	Manitoba Aboriginal and Northern Affairs Aboriginal Consultation Unit
m.a.s.l.	metres above sea level
MCHT	Manitoba Culture, Heritage and Tourism
MCWS	Manitoba Conservation and Water Stewardship Department
MH	Manitoba Hydro
MKO	Manitoba Keewatinowi Okimakanak (a regional chiefs' organization, covering most First Nations communities in Northern Manitoba)
mm	Millimetre
MMF	Manitoba Métis Federation
MPMO	Major Projects Management Office
MOL	Minimum Operating Level
NCN	Nisichawayasihk Cree Nation
NFA	Northern Flood Agreement
NFAT	Need For and Alternatives To
NGC	New Generation Construction Division

NHR	Northern Health Region (formerly the Burntwood Regional Health Authority)
NLHS	Northern Lights Heritage Services
OH&S	Occupational Health and Safety
OHSAS	Occupational Health and Safety Assessment Series
OMS	Operations, Maintenance and Surveillance Manuals
PD	Purchasing Department
PIP	Public Involvement Program
PMF	Probable Maximum Flood
PRLC	Partners' Regulatory and Licensing Committee
PUB	Public Utilities Board
TAC	Technical Advisory Committee
TCN	Tataskweyak Cree Nation
TSS	Total Suspended Solids
TPD	Transmission Planning and Design Division
VEC	Valued Environmental Component
WLFN	War Lake First Nation
YFFN	York Factory First Nation

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# Executive Summary

This report presents an Official Assessment conducted in accordance with the Preparation Tool of the Hydropower Sustainability Assessment Protocol. The assessment is conducted for the planned 695 MW Keeyask hydropower project, which will be located near the town of Gillam in northern Manitoba, Canada, on the Nelson River. The assessment does not focus on wider sustainability performance of Manitoba Hydro (MH) or the Keeyask Cree Nations (KCN). This said, under several Protocol topics, the corporate-level performance of MH as the operator (on behalf of the KHLP) is relevant.

The project developer is the Keeyask Hydropower Limited Partnership (KHLP), consisting of MH and the four KCN: Fox Lake Cree Nation (FLCN); Tataskweyak Cree Nation (TCN); War Lake First Nation (WLFN); and York Factory First Nation (YFFN). MH will build and operate the Keeyask project on behalf of the KHLP. MH is an energy business entirely owned by the Province of Manitoba. It owns and operates several hydropower plants, including five on the Nelson River: Jenpeg; Kelsey; Kettle; Long Spruce; and Limestone as well as the recently constructed Wuskwatim (which is owned in partnership with the Nisichawayasihk Cree Nation) on the Burntwood river, a tributary of the Nelson.

The assessment was undertaken in the context of a strong regulatory environment in which both the federal and provincial authorities have requirements for multiple aspects of socio-environmental assessment and investigations; power-plant operations, performance, accident preparedness, governance and community relations, to mention but a few.

Keeyask meets or exceeds basic good practice (a score of 3) for all of the 22 topics assessed.

Keeyask performs at the level of basic good practice (a score of 3, with two significant gaps at the level of proven best practice), for one topic: P-18 Public Health.

The project performs with one significant gap at the level of proven best practice (a score of 4) on a further five topics: P-7 Hydrological Resource; P-8 Infrastructure Safety; P-11 Economic Viability; P-12 Procurement; P-16 Labour & Working Conditions.

Keeyask meets proven best practice (a score of 5) on the remaining sixteen topics: P-1 Communications & Consultations; P-2 Governance; P-3 Demonstrated Need & Strategic Fit; P-4 Siting & Design; P-5 Environmental & Social Impact Assessment & Management; P-6 Integrated Project Management; P-9 Financial Viability; P-10 Project Benefits; P-13 Project-Affected Communities & Livelihoods; P-15 Indigenous Peoples; P-17 Cultural Heritage; P-19 Biodiversity and Invasive Species; P-20 Erosion & Sedimentation; P-21 Water Quality; P-22 Reservoir Planning; and P-23 Downstream Flow Regimes.

The significant gaps that were identified by the assessment are:

One gap against the Assessment criteria, level 5, proven best practice (topic P-7).

Three gaps against the Management criteria, level 5, proven best practice (topics P-8, P-12 and P-18).

No gaps against the Stakeholder Engagement criteria.

No gaps against the Stakeholder Support criteria.

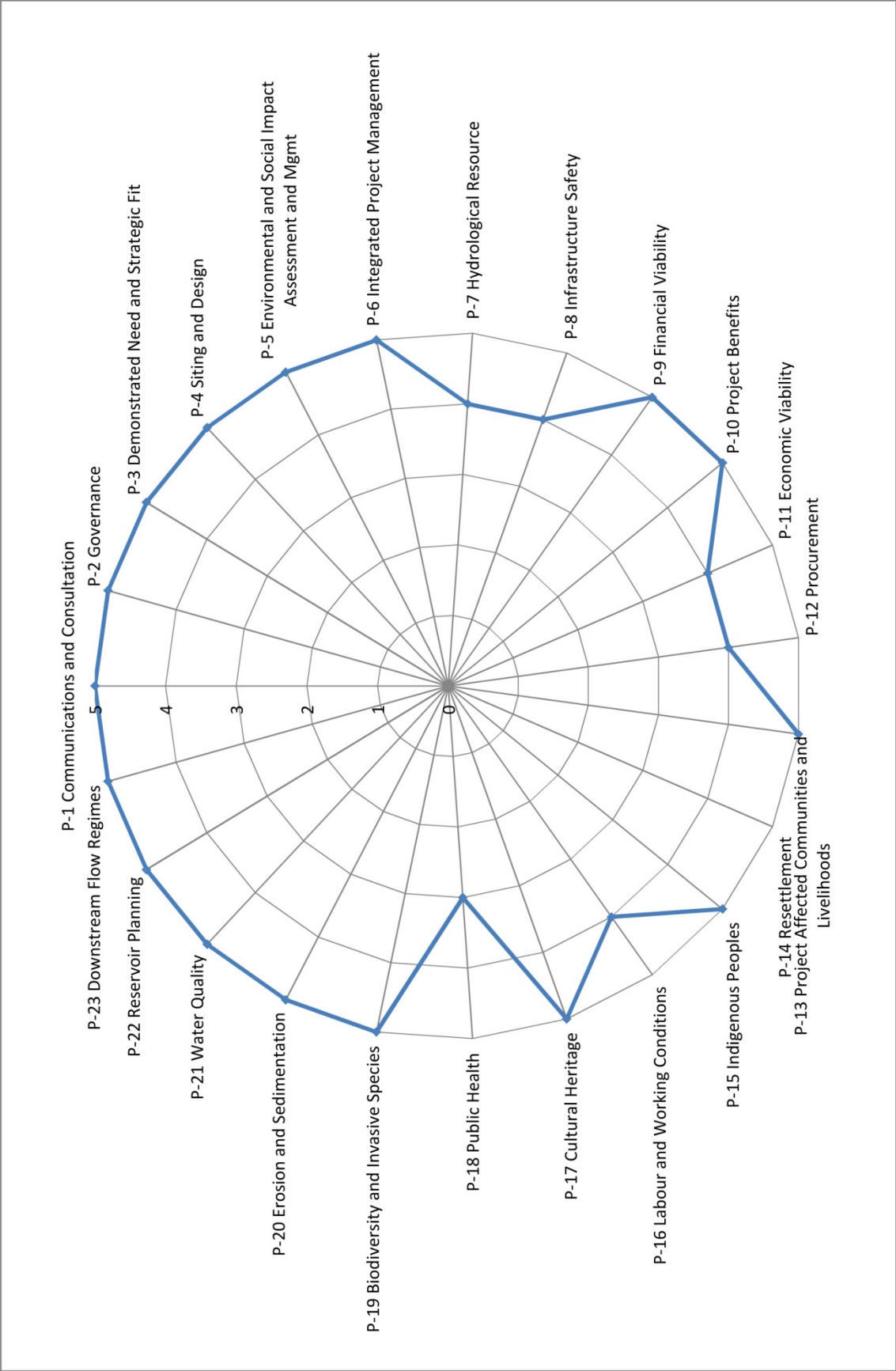
No gaps against the Conformance/Compliance criteria.

Three gaps against the Outcomes criteria, level 5, proven best practice (topics P-11, P-16 and P-18).

Topic P-14 Resettlement was not assessed as it is considered Not Relevant for this project, as there will be no physical displacement resulting from the Keeyask development.

The spider diagram on the following page summarises the Keeyask assessment in numbers. Detailed comments for each assessed Topic follows in sections 1-13 and 15-23.

# Sustainability Profile





## Table of Significant Gaps

	Level 3: Significant Gaps against Basic Good Practice	Level 5: Significant Gaps against Proven Best Practice
Assessment	No significant gaps	<b>P-7:</b> Assessment of the impact of climate change on the Nelson River flow will not be complete before the Keeyask design is finalised.
Management	No significant gaps	<p><b>P-8:</b> There is no process for the independent review of emergency-response plans.</p> <p><b>P-12:</b> Anti-corruption criteria are not explicitly addressed in contract documents nor emphasised in procurement-planning processes.</p> <p><b>P-18:</b> The absence of processes to respond to an increased incidence and severity of non-communicable diseases resulting from Keeyask's development.</p>
Stakeholder Engagement	No significant gaps	No significant gaps
Stakeholder Support	No significant gaps	No significant gaps
Conformance/ Compliance	No significant gaps	No significant gaps
Outcomes	No significant gaps	<p><b>P-11:</b> There is not enough evidence to argue that benefits of the project outweigh costs under a wide range of circumstances.</p> <p><b>P-16:</b> Labour management policies, plans and practices are not demonstrated to be consistent with internationally recognised labour rights.</p> <p><b>P-18:</b> The absence of plans to support and enhance the capacity of health services in KCN communities and the town of Gillam to address significant pre-project public health conditions, particularly those of non-communicable diseases.</p>

# Introduction

This report presents the findings of an assessment of the Keeyask project, which is under preparation, using the Hydropower Sustainability Assessment Protocol. Keeyask is planned as a 695 MW facility, fully owned by the Keeyask Hydropower Limited Partnership, and located in northern Manitoba, Canada.

## The Hydropower Sustainability Assessment Protocol

The Hydropower Sustainability Assessment Protocol ('the Protocol') is a framework to assess the performance of hydropower projects according to a defined set of sustainability topics, encompassing environmental, social, technical, and financial issues.

Developed by the International Hydropower Association (IHA) in partnership with a range of government, civil society and private sector stakeholders, the Protocol is a product of intensive and transparent dialogue concerning the selection of sustainability topics and the definition of good and best practice in each of these topics. Important reference documents that informed the development of the Protocol include the World Bank safeguards policies, the Performance Standards of the International Finance Corporation, and the report of the World Commission on Dams. To reflect the different stages of hydropower development, the Protocol includes four assessment tools that are designed to be used separately, corresponding to the Early Stage, and Preparation, Implementation and Operation stages of a project.

Applying the Protocol delivers an evidence-based assessment of performance in each topic, with a set of scores providing an indication of performance in relation to basic good practice and proven best practice. The scoring system is as follows:

- 5 Meets basic good practice and proven best practice;
- 4 Meets basic good practice with one significant gap against proven best practice;
- 3 Meets basic good practice with more than one significant gap against proven best practice;
- 2 One significant gap against basic good practice;
- 1 More than one significant gap against basic good practice.

This means that if there is one or more gap(s) at the level of basic good practice, the topic cannot score higher than a 2 or a 1, respectively. Only if all criteria at the level of basic good practice are satisfied will the assessor move on to the criteria for the level of proven best practice.

Assessments rely on objective evidence to support a score for each topic that is factual, reproducible, objective and verifiable. Key attributes of the Protocol are: (i) global applicability, i.e. it can be used on all types and sizes of hydropower projects, anywhere in the world; and (ii) consistency, i.e. the consistency of its application is carefully governed by a system of quality control encompassing accredited assessors, terms and conditions for use, and the Protocol Council.<sup>1</sup>

Scoring is an essential feature of the Protocol, providing an easily communicated and replicable assessment of the project's strengths, weaknesses and opportunities. The scoring system has been devised to ensure that a Protocol Assessment cannot provide an overall 'pass' or 'fail' mark for a project, nor can it be used to 'certify' a project as sustainable. The Protocol provides an effective mechanism to continuously improve sustainability performance because results identify gaps that can be addressed, and the findings provide a consistent basis for dialogue with stakeholders.

## Assessment Objectives

KHLP identified the following objectives for the assessment:

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<sup>1</sup> Full details of the Protocol and its governance, are available on [www.hydrosustainability.org](http://www.hydrosustainability.org).

- To understand overall sustainability of the Generating Station in the Preparation phase as assessed with the protocol.
- Further, to indicate where the Project performs well and where the Project presents opportunities for improvement.
- The information obtained through the assessment will be used under advisement.

## Project Description

The Project will be a 695 MW hydropower plant located at Gull Rapids on the lower Nelson River immediately upstream of Stephens Lake in northern Manitoba, see Figure 1. The renewable hydroelectric energy produced by the Project will be sold to Manitoba Hydro and integrated into its electric system for use in Manitoba and for export. It is anticipated that the average annual production of electricity will be approximately 4 400 GWh.

The Project will be located in the boreal forest of the Canadian Shield on provincial Crown land approximately 180 km northeast of Thompson, 60 km northeast of Split Lake, and 30 km west of Gillam. Gull Rapids has three large channels with a total length of approximately 3.7 km and a drop in elevation of approximately 12 m. The river is approximately 2.5 km wide at the widest part of Gull Rapids.

The power-house and service-bay complex will contain seven fixed-blade vertical-shaft turbines and generators, and will be located on the north side of the Nelson River. The spillway will be located 1.6 km south-west of power house and will consist of a seven-bay concrete-overflow structure with each bay having a vertical-lift gate. Three dams (the north dam, central dam, and south dam) will be constructed across Gull Rapids, creating a 93 km<sup>2</sup> reservoir upstream of the powerhouse. The Project will flood 45 km<sup>2</sup> of land and the reservoir is predicted to expand by 7-8 km<sup>2</sup> during the first 30 years of operation, due to erosion of mineral-soil shorelines and peat-land disintegration. The Project will operate with a reservoir level full supply level (FSL) of 159 metres above mean sea level (m.a.s.l.) and a minimum operating level (MOL) of 158 m, yielding  $81 \times 10^6$  m<sup>3</sup> of active storage. The project will operate using either a base-load mode of operation (no draw-down of the reservoir level) or a peaking mode of operation where the reservoir would be drawn down to utilise the 1 m of regulation available.

The 1.6 km long central dam will be located between the power house and spillway. The north dam will be 100 m long and the south dam will be 565 m long. A series of discontinuous earth-fill dykes will be located along both sides of the river to contain a 93 km<sup>2</sup> reservoir. To facilitate inspection and maintenance, a roadway will be constructed on top of the dykes and on high ground between the sections of dykes. Including the roadway sections, these earth dykes will extend 11.6 km on the north and 11.2 km on the south sides of the river.

The Project will also include several measures to mitigate and compensate for effects of the Project on the physical, aquatic, terrestrial and socio-economic environments. A few of these measures include:

- Waterways Management Program
- Reservoir Clearing Plan
- Lake Sturgeon, Lake Whitefish and Walleye spawning shoals
- Lake Sturgeon stocking
- Development of new wetlands
- Constructed nesting islands for gulls and terns
- Constructed channels to mitigate fish stranding and oxygen depletion
- Constructed habitat for young sturgeon
- Offsetting Programs
- Comprehensive Mercury, Fish & Human Health Communication Program
- Access Management Plan
- Trappers' Compensation Program
- Carefully chosen sitings of workers' camps to limit social impacts.

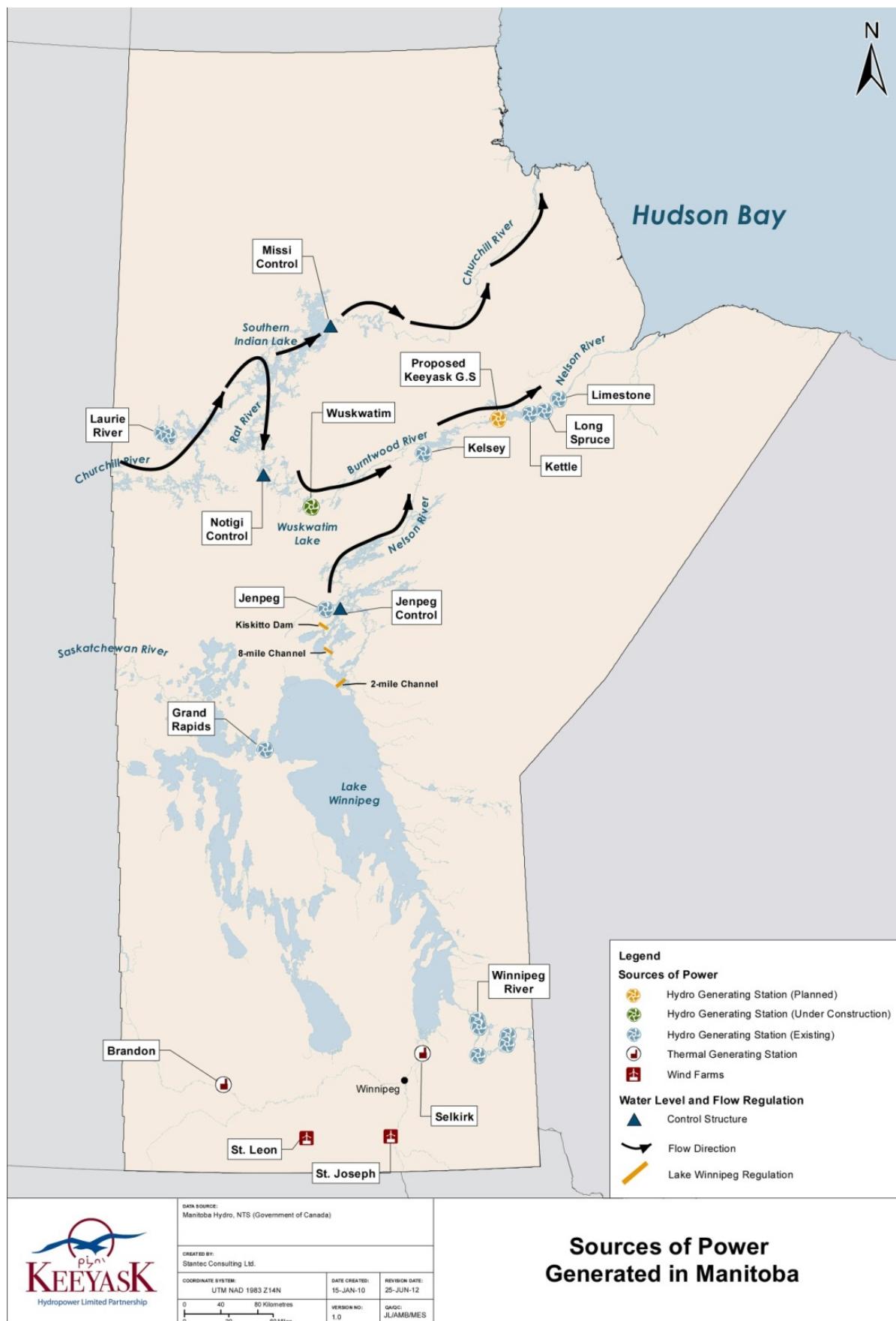


Figure 1. Sources of Power generated in Manitoba

Temporary infrastructure will consist of roads, borrow pits, causeways, camp and work areas, concrete batch plant, water and waste-water treatment plants, safety and security facilities, a communications tower, explosives magazine, cofferdams, rock groins, boat launch, an ice boom and safety booms. Permanent infrastructure consists of a 25 km north access road, 35 km south access road, borrow sources, placement areas for excavated material, a communications tower, portions of some cofferdams and groins, a transmission tower spur, barge landings, boat launches, a portage, and safety and security facilities.

Some of the supporting infrastructure is being constructed as part of the Keeyask Infrastructure Project (KIP) which started construction in 2012 and is planned for completion in 2014. The KIP consists of construction and operation of a start-up camp capable of accommodating approximately 125 people with an engineered wastewater treatment plant, construction of the 25 km two-lane, all-weather gravel north access road and construction of a 500-person main camp on the north side of Gull Rapids in northern Manitoba.

Manitoba Hydro will construct and own the Keeyask Transmission Project (KTP). This project includes a construction-power substation located immediately north of the generating station and a 22 km long construction-power transmission line that will cross the river to the south. This transmission line will provide power to construct the generating station. During the operation phase this line will provide a backup source of offsite power to the generating station. Transmission lines will connect the generating station to a switching station located south of the generating station. Generation outlet transmission lines, 35 km in length, will connect the switching station to the Radisson Converter Station located near Gillam. One of these transmission lines will be built earlier than the other two to serve as a back-up source of power for the construction of the power plant.

Power will be transmitted to the main markets through the existing Manitoba high-voltage transmission grid owned and operated by Manitoba Hydro. There is an ongoing licencing process for an additional line which is needed to guarantee the stability and security of the grid. This project is called Bipole III and consists of a 500 kV HVDC (high-voltage, direct-current) line which a suggested routing from the hydropower cascade development on the lower Nelson river in the north-east of Manitoba, west of Cedar Lake and Lake Winnipegosis to the city of Winnipeg. The Keeyask project cannot go ahead without Bipole III, but the line is considered a necessary development with or without the Keeyask project and is, therefore, excluded from our assessment.

The Project will take approximately eight and a half years to construct (the expected construction period runs from June 2014 to November 2022). The last three years will involve commissioning of the seven power-house units, decommissioning of temporary infrastructure, site clean-up and rehabilitation. The operation phase will begin with the initial generation of power from the first unit in approximately November 2019. The remaining six units will be brought into operation progressively over the following year (i.e., November 2019 to December 2020). The first three years of the operation phase of the Project will overlap with the last three years of the construction phase. Once operation is initiated, the Project will be operated as part of the overall Manitoba Hydro integrated system.

Development of the Keeyask Generation Project is a collaborative effort between Manitoba Hydro, Tataskweyak Cree Nation and War Lake First Nation (acting as the Cree Nation Partners), York Factory First Nation, and Fox Lake Cree Nation. These four limited partners comprise the Keeyask Hydropower Limited Partnership (KHLP).

The parties have negotiated the Joint Keeyask Development Agreement (JKDA), an agreement that governs how the project will be developed, as well as setting out understandings related to potential income opportunities, training, employment, business opportunities and other related matters.

Manitoba Hydro will provide administrative and management services for the KHLP and will own at least 75% of the equity of the partnership. The four Manitoba First Nations, known collectively as the Keeyask Cree Nations (KCN), through each of their respective investment entities, together have the right to own up to 25% of the partnership.

The following table summarises the main design parameters for the Keeyask Project.

Table 1. Keeyask Hydropower Plant Design Parameters

Parameter	Value
Full Supply Level (FSL)	159 m
Minimum Operating Level (MOL)	158 m
Average Head	18.3 m
Turbine Type	Fixed Blade Vertical Shaft Propeller
Number of Turbines	7
Initial Reservoir Area	93 km <sup>2</sup>
Flooded Area	45 km <sup>2</sup>
Live Reservoir Storage (storage between MOL and FSL)	81.4 million m <sup>3</sup>
Full Gate Discharge with Stephens Lake at 141.12 m.a.s.l. (FSL)	4 000 m <sup>3</sup> /s
Full Gate Discharge with Stephens Lake at 139.6 m.a.s.l. (Low Level)	4 100 m <sup>3</sup> /s
Best Gate Discharge with Stephens Lake at 141.12 m.a.s.l. (FSL)	3 850 m <sup>3</sup> /s
Best Gate Discharge with Stephens Lake at 139.6 m (Low Level)	3 900 m <sup>3</sup> /s
Rated Total Output Power at Stephens Lake at 141.12 m (FSL)	630 MW
Rated Total Output Power at Stephens Lake at 139.6 m (Low Level)	695 MW
Generator Rated Output	99.3 MW/117 MVA
Average Annual Energy	4 400 GWh
Annual Dependable Energy	2 900 GWh

Notes:

1. Plant discharge is influenced by the level of Stephens Lake, which controls the water level at the downstream end of the Keeyask power plant. The FSL for Stephens Lake is 141.12 m.a.s.l. Historically, Stephens Lake levels have been at or below 139.6 m.a.s.l. 10% of the time and this condition is used here to represent Keeyask plant conditions at low Stephens Lake levels.
2. Full-gate discharge refers to the discharge through all 7 units occurring when the wicket gates are set to allow the maximum flow through the turbines at a given head. The efficiency at this gate setting is typically less than the best-gate setting. Best-gate discharge refers to the discharge through all 7 units occurring when the wicket gates are set to achieve the maximum efficiency for the turbine at a given head. Generally, the preferred setting is best-gate discharge to generate the most energy from a given volume of water. If the river flow exceeds the plant discharge capacity excess water will be discharged over the spillway and full gate settings will generally be used for the water passing through the turbines to generate electricity.
3. The full-gate discharge, best-gate discharge and rated total output power are current estimates that may change slightly during the final design of the turbines and water passage.



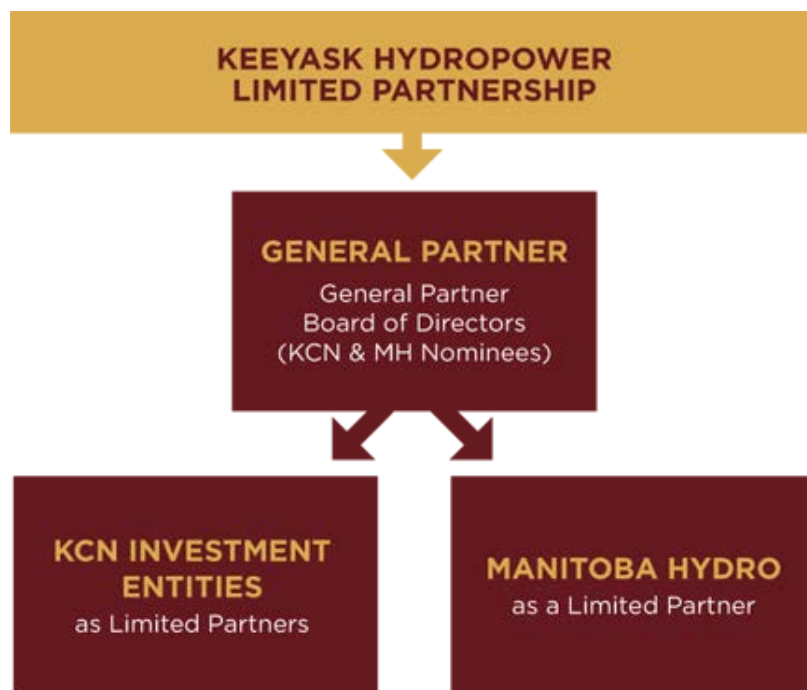


Figure 2. Structure of Keeyask Hydropower Limited Partnership

The Keeyask Hydropower Limited Partnership, illustrated in Figure 2, will own the Keeyask Generating Station. The partnership consists of the General Partner (5900345 Manitoba Ltd.), Manitoba Hydro and KCN investment entities. The General Partner is a wholly owned subsidiary of Manitoba Hydro and is responsible for managing the business of the partnership.



Figure 3. The same area as in the cover-page picture, but in an artist's rendering of the project layout, seen from the south. (from Keeyask EIS).

## Brief History of the Keeyask Project Development

For a detailed description of the project and its context in northern Manitoba in the ancestral homeland of the Cree nations, please see the Environmental Impact Statement which can be found at: <http://keeyask.com/wp/the-project/environmental-assessment-process/eis>

Manitoba Hydro began developing hydropower projects on the Nelson River 50 years ago and the following list includes key milestones:

1957-61	Kelsey hydropower plant constructed
1970-77	Lake Winnipeg Regulation and the Churchill River Diversion constructed
1966-74	Kettle hydropower plant constructed
1977	Northern Flood Agreement – agreement between Canada, Manitoba, Manitoba Hydro and the Northern Flood Committee (representing five Cree Nations: Split Lake First Nation – now known as Tataskweyak Cree Nation (TCN); York Factory First Nation (YFFN); Norway House Cree Nation; Cross Lake First Nation; and Nelson House First Nation – now known as Nisichawayasihk Cree Nation – to address the impacts caused by the regulations, diversions and hydropower developments. It provided a range of remedial and compensatory measures, including compensation programmes for e.g. trappers and fishermen.  The individual Keeyask Cree Nations have since signed separate agreements with Canada, Manitoba and Manitoba Hydro regarding implementation of obligations under the Northern Flood Agreement. TCN did so in 1992 and YFFN in 1995. FLCN and WLFN, not parties to the Northern Flood Agreement, signed their own agreement addressing past impacts in 2004 and 2005 respectively.
1973-79	Long Spruce hydropower plant constructed
1976-78/ 1985-92	Limestone hydropower plant constructed
1992	TCN signed separate agreements with Canada, Manitoba and Manitoba Hydro regarding implementation of obligations under the Northern Flood Agreement.
1992-96	TCN and Manitoba Hydro undertook a series of studies to analyse the potential impacts for further hydropower development on the lower Nelson.
1995	YFFN signed separate agreements with Canada, Manitoba and Manitoba Hydro regarding implementation of obligations under the Northern Flood Agreement.
2000	Keeyask AIP is signed between Manitoba Hydro and TCN. The AIP made provision for involving other First Nations. TCN invited FLCN, YFFN and WLFN to join the AIP.
2000	The name of the project is changed from Gull Rapids Generating Station to Keeyask, the Cree word for gull.
2002	The Gull (Keeyask) Project Negotiating Principles and Process Proposal is adopted between Cree Nation Partners (TCN and War Lake), YFFN, FLCN and Manitoba Hydro.
2004	FLCN signed separate agreements with Manitoba and Manitoba Hydro regarding adverse effects of past projects.
2005	WLFN signed separate agreements with Manitoba and Manitoba Hydro regarding adverse effects of past projects.
2007	Manitoba Hydro and FLCN signed a Joint Statement on the Harmonized Gillam Development.



- 2009 The Keeyask JKDA is signed between the KCNs and Manitoba Hydro, following negotiations between 2002 and 2008. The JKDA addresses, among other things, KCN's potential income opportunities, training, employment, business opportunities, and their involvement in the KHLP.
- 2009 Adverse effects agreements for each KCN are also signed.

## Assessment Process

The Keeyask assessment process started with a training course on the use of the Hydropower Sustainability Assessment Protocol to Manitoba Hydro staff during August, 2012, provided by staff from IHA. The Protocol and the Preparation Tool in particular were reviewed in detail, scoring criteria were discussed and the process of identifying interviewees, documentary evidence and preparing a scoping document were initiated.

Between August and early December 2012, Manitoba Hydro conducted a number of tasks including:

- Provision of some basic background information to the assessment team
- Set-up of data room on Manitoba Hydro intranet. This did, unfortunately, not function satisfactorily.
- Liaison with identified interviewees to provide them with background information and confirm their availability to be interviewed
- Assessment schedule development and logistical planning.

The on-site assessment was conducted between the 4<sup>th</sup> and the 10<sup>th</sup> of December, 2012, by a team of four accredited assessors and two assessors-in-training. The process involved collection of verbal, visual and documentary evidence to evaluate project processes and performance against the Protocol's Preparation scoring criteria.

An independent dam-safety review panel was commissioned in early 2013, and its report has been included as evidence for this assessment.

The documentary evidence has been provided both in the form of hard copies during the on-site assessment, and in a web-based data room.

The assessment team conducted interviews in Winnipeg and Gillam, at the construction camp for the northern access road and at the four Keeyask Cree Nations – FLCN, TCN, WLFN and YFFN. A total of 89 individuals were interviewed, some of them multiple times and on a variety of topics. A site visit was conducted which covered key project locations with the aid of a helicopter. This site visit was eminently guided by staff from Manitoba Hydro. Interviews covered the perspectives of Keeyask Cree Nations, Manitoba Hydro staff, Manitoba government institutions, non-governmental organisations, academics and media. For every topic an effort was made to ensure that those with the responsibilities and most direct insights into the issues were interviewed.

Appendices B and C contain information on the interviews conducted and the documents reviewed. Both Manitoba Hydro and the Assessment Team have done their best to ascertain the accuracy of the information provided in those appendices.

The assessors made every effort to ensure attention to cross-cutting issues particularly relevant to this project. Those relevant to the Keeyask project are climate change, human rights and transparency. An indication of which topics refer to relevant issues is as follows:

- **Climate Change:** Aspects of climate change are considered primarily under P-7 Hydrological Resource, but also under P-3 Demonstrated Need and Strategic Fit; P-5 Environmental & Social Issues Management; and P-22 Reservoir Planning.
- **Human Rights:** Aspects of human rights are considered under P-1 Communications & Consultation; P-5 Environmental & Social Impact Assessment&Management; P-12 Procurement; P-13 Project-Affected Communities & Livelihoods; P-15 Indigenous Peoples; and P-16 Labour & Working Conditions. Whilst these relevant areas of consideration are not necessarily labelled as "human rights", in these topics, stakeholder rights and labour rights are clearly addressed.

- **Transparency:** Aspects of transparency are primarily considered as parts of P-2 Governance and P-12 Procurement.

Triangulation of evidence – visual, verbal and documentary – is an important requirement for the evidence-collection process. Particular attention was paid to interviews with project-affected communities.

Follow-up evidence was requested by, and provided to, the assessors in the weeks following the assessment. This draft report was provided to Manitoba Hydro on 18 January, 2013, for review of technical accuracy with respect to project, evidence and institutional references. Comments were received from the KHLP on the 1<sup>st</sup> of April, 2013. Following editing in response to KHLP's comments, this Official Assessment report was filed in July, 2013.

## Assessment Experience

The on-site assessment was well supported by the Single Point of Contact and her Local Support Team. The planning for the site visit was able to deal with changeable weather at the height of winter in a highly satisfactory manner.

The interviewees shared their views and knowledge openly and professionally, thereby assisting the assessment team well in its task of understanding the project, and being able to assess and score the 22 relevant topics in accordance with the Protocol's requirements.

Much of the documentary evidence is publicly available as part of the licensing process that is ongoing for the Keeyask Generation Project. Most of the documentation relevant to the Keeyask Infrastructure Project has also been publicly available. Such documents that are not public have partly been viewed under confidentiality, either during interviews or uploaded to the data room. Unfortunately access to the data room has proven very difficult, with the result that no assessors had access before the on-site assessments, and some not even during that time. This could have been dealt with more efficiently, and an alternative approach is strongly recommended for future Assessments. In addition, the length of time to gather comments on the draft report was longer than anticipated, owing to the need to gather comments from across the partnership. We recommend that in future Protocol assessments, Manitoba Hydro and its partners in future projects adopt a process that can ensure that comments are provided according to the agreed schedule.

Unfortunately some important relevant agencies of the federal government declined participation in the assessment due to a potential conflict-of-interest with the ongoing licensing process.

## Layout of this Report

This report consists of twenty-three sections numbered in direct correspondence with the twenty-three topics of the Protocol's Preparation tool. Four appendices are provided, including the written letter of support of the project operator (required for an official Protocol assessment), and detailing the items of visual, verbal and documentary evidence referred to under each topic.

For each topic, findings are provided according to the criteria used in the Protocol's methodology: Assessment, Management, Stakeholder Engagement, Stakeholder Support, Conformance / Compliance, and Outcomes. Findings are presented against a statement of 'basic good practice' and a statement of 'proven best practice' for each, with a 'Yes/No' indication of whether the scoring statement is met. A summary of the significant gaps against the scoring statement, the topic score and a brief summary are presented at the close of each topic section.

# 1 Communications and Consultation (P-1)

This topic addresses the identification and engagement with project stakeholders, both within the company as well as between the company and external stakeholders (e.g. affected communities, governments, key institutions, partners, contractors, catchment residents, etc.). The intent is that stakeholders are identified and engaged in the issues of interest to them, and communication and consultation processes establish a foundation for good stakeholder relations throughout the project life.

## 1.1 Background Information

Stakeholders in Keeyask that are directly-affected are: the partners in KHLP (Manitoba Hydro – MH – and four First Nations acting as three KCN partners); KCN members residing in local communities; residents of Gillam and Thompson; MH employees; engineering and service contractors involved in implementation; and agencies at provincial and federal levels with regulatory, licensing and public service responsibilities for Keeyask and communities local to Keeyask. Additional stakeholder groups that are not directly-affected are: KCN members residing outside of the KCN communities; potentially-affected aboriginal people other than members of the KCN, including Métis (people of mixed First Nations and European descent); residents of other communities in the northern part of Manitoba; and the general public of Manitoba.

P-1 addresses the management of communications and consultation, and overall performance in stakeholder engagement, whilst subsequent topics in this assessment, where appropriate, focus on stakeholder engagement particularly relevant to the individual topic.

## 1.2 Detailed Topic Evaluation

### 1.2.1 Assessment

#### Analysis against basic good practice

**Scoring statement:** *Stakeholder mapping has been undertaken to identify and analyse stakeholders, to establish those that are directly affected, and to establish communication requirements and priorities, with no significant gaps.*

The Protocol states that “stakeholder mapping refers to identification and grouping of stakeholders in a meaningful way, for example based on stakeholder rights, risks and responsibilities”, and that directly-affected stakeholders are those with “substantial rights, risks and responsibilities” including regulators and investment partners. Consultants appointed by Manitoba Hydro initially identified communities that may be affected as early as 2000 (in Status Report # 1 of the Wuskwatim, Notigi and Gull Rapids Generating Stations and Transmission Facilities Environmental Assessment Study). In 2001, in response to a request from Manitoba Hydro, these consultants identified stakeholders within communities in a detailed manner, and grouped them by community, with a rationale for the inclusion of each community. KHLP or MH have not mapped stakeholders other than community-level groups, such as NGOs and regulators, but the assessment team do not consider this to be a significant gap, as the absence of a complete stakeholder-mapping exercise has not exposed Keeyask’s preparation to risks related to stakeholder relations. In practice, stakeholders have been identified and grouped through: the ongoing partnership with KCN in the KHLP; KCN partner’s extensive consultations with their members; the Public Involvement Programme (PIP) carried out by KHLP alongside the EIS process; public hearings linked to the environmental licensing of Keeyask; and management of regulatory processes and project preparation by the Pre-construction Project Team. These are described more fully under Stakeholder Engagement below.

### Analysis against proven best practice

**Scoring statement:** *In addition, the stakeholder mapping takes broad considerations into account.*

The above-mentioned processes have taken a broad approach to the identification of external stakeholders, for example with a very inclusive geographical approach to the identification of stakeholder communities (all of northern Manitoba) and a wide range of regulatory agencies at provincial and federal levels.

Despite this broad approach, certain internal stakeholder groups have not been identified, for example internal stakeholders amongst MH staff who are not directly involved in Keeyask preparation and implementation, and site-based staff (already in place on the KIP). This is a gap, but is not considered to be significant at this stage, as it has not exposed Keeyask to unmanageable risks.

## 1.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Communications and consultation plans and processes, including an appropriate grievance mechanism, have been developed at an early stage applicable to project preparation, implementation and operation that outline communication and consultation needs and approaches for various stakeholder groups and topics.*

Communications and consultation processes that were developed at an early stage, implemented for project preparation and which will continue for implementation and operation are: engagement between KCN Chiefs and Councils and MH within KHLP, and agreements of the partners that govern this engagement; Responsibilities for public announcements between KGP, MH and KCN are set out in the JKDA; and Agreements on consultation frameworks between the Crown (represented by Manitoba Conservation and Water Stewardship) and KCN, setting out the principles, objectives and means of consultation between the crown and each KCN for a range of developments including Keeyask.

There are a range of other ongoing processes described under Stakeholder Engagement below, but these were not developed at an early stage, or are not plans or procedures that set out approaches to communications and consultation.

The Public Involvement Programme (PIP) was jointly developed by MH and KCN in 2007, to guide engagement activities with aboriginal communities and stakeholders beyond the KCN communities. The PIP concerns the preparation stage only, and sets out the purpose and principles of public involvement, target audiences, stages of consultation, documenting consultation, methods, and schedule.

The Keeyask Project Communication Plan (final version July 2010) sets out a purpose, objectives and means for external and internal communications, responsibilities for communication within the partnership, a 'Public Announcement Framework', and a protocol for communications related to the environmental and regulatory process. The plan mainly concerns the preparation and implementation phases, but includes activities that could continue into operation.

Processes have been implemented during preparation to allow grievances to be raised, and will continue through implementation. These include: future-development team offices in each KCN community; regular open community meetings; a KHLP phone line and email address; and the dispute resolution and mediation measures included in the JKDA. From implementation, a community liaison officer will be based at the construction camp. There do not appear to be any formal procedures to track and ensure a response to grievances raised. At this stage, this is not a significant gap.

### Analysis against proven best practice

**Scoring statement:** *In addition, communication and consultation plans and processes show a high level of sensitivity to communication and consultation needs and approaches for various stakeholder groups and topics; and processes are in place to anticipate and respond to emerging risks and opportunities.*

The plans and processes described above show a high level of sensitivity to communications and consultation needs and approaches for most stakeholder groups, and provide management processes to respond to most communication or consultation risks and opportunities. For example, approaches to communication amongst KHLPP partners show a high level of sensitivity to KCN partners, and future-development teams and the Community Liaison Officer show high sensitivity to KCN community members. The PIP has been sensitive to suitable consultation approaches of a wide range of stakeholders, indicated by a combination of one-on-one meetings and public hearings.

Examples of emerging risks include: the significant risk that KCN community members and the general public will see Keeyask as a MH-driven project; consultation fatigue amongst KCN communities; and conflation of Keeyask with the Bipole III project by the general public. A response to the first two of these risks is embedded in the project's governance and the creation of the KHLPP partnership. Responses to the latter have included scheduling the PIP to avoid conflict with the PIP of Bipole III, and the Clean Environment Commission scheduling Bipole III hearings and Keeyask hearings separately.

KHLPP has also established processes to continue to respond to emerging risks and opportunities related to communications and consultation, including: the KCN Pre-hearing Consultation Committee meeting every one to two months and reviewing plans for communications and consultations prior to hearings; quarterly meetings of the Partners Regulatory and Licensing Committee (PRLC), which is the senior regulatory committee with representation from each of the KCNs; the Monitoring Advisory Committee, which will recommend an appropriate approach to communicating the results of monitoring activities for each KCN; the release of information to the public following a 'Keeyask Communication Protocol'; and ultimately the decisions of the General Partner Board of Directors. Manitoba Hydro provided evidence of the PRLC considering a recommendation on Round 1 of the PIP, and updates on the PIP being considered in subsequent PRLC meetings through 2008. Meetings of the Keeyask Partners to discuss Keeyask Communication and Public Presence were held through 2010 to develop the Keeyask Project Communication Plan of 2010, and Keeyask Communication Protocol. These set out responsibilities amongst the partnership for public communication and announcements, e.g. in the event of emergencies and key project milestones.

Criteria met: Yes

## 1.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The project preparation stage has involved appropriately timed communications and engagement, often two-way, with directly affected stakeholders on topics of interest and relevance to them; engagement is undertaken in good faith; ongoing processes are in place for stakeholders to raise issues and get feedback.*

To date, preparation for the Keeyask project has involved appropriately-timed engagement with directly-affected stakeholders, which has been convincingly two-way and conducted in good faith, through the following comprehensive list: engagement between KCN Chiefs and Councils and MH on the development of the KHLPP for more than a decade, proceeding through Agreements-in-Principle and Adverse Effects Agreements, and culminating in the JKDA in 2009; A multi-year process of engagement of KCN members by KCN leadership, including a range of processes, including the Overview of Water and Land (OWL) Working Group, reference groups convened for the KCN Environmental Evaluation reports, regular open community meetings, off-reserve meetings (in Churchill, Thomson and Winnipeg), a website created by the CNP, the KHLPP

website, and referenda for each community (see P-15); Consultation for the KTP using Aboriginal Traditional Knowledge, and two rounds of open house meetings, involving the identification of alternative routes and the refinement of a selected route; Preparation and dissemination of a video, *Keeyask: Our Story*; Federal-level public consultation by the Canadian Environmental Assessment Agency (CEAA) including a public notice on their website with calls for public comment and CAD 35 000 through the Participant Assistance Programme); Engagement with regulatory agencies, beginning from 2005, and including informal meetings with a range of regulatory stakeholders in 2008, the delivery of updated presentations on the project to a wide range of agencies in May 2010 and May 2011, and technical meetings with agencies in 2009 and 2011; A detailed response to EIS Guidelines issued by Canada and Manitoba in response to KHLP's application for environmental approvals; A meeting of the Technical Advisory Committee (TAC, which involves a wide range of agencies) for the project in January 2012 and; Communication amongst MH employees with responsibilities for preparation and implementation, through the teams and processes referred to under P-6.

In addition, the PIP has engaged a range of stakeholders, some of whom may be directly- affected: aboriginal people other than the KCN, aboriginal advocacy groups, other potentially affected people and groups amongst the general public, and federal and government agencies with responsibilities for licensing and approvals. The first round of the PIP, held from June to December 2008, was to introduce the project, learn about stakeholders' issues, and hear how the public wish to be consulted. The second round from February to May 2012 concerned a description of the project features, results of the environmental assessments, documenting public input, and receiving input on possible mitigation measures.

Engagement with directly-affected stakeholders will continue for the remainder of the preparation stage through the following: pre-hearing committees to be held between MH and KCN to ensure that all are prepared for the CEC hearings; A third round of the PIP, following submission of the EIS, to communicate EIS findings and conclusions; CEC public hearings, which are likely to take place in late 2013, and NFAT hearings in early 2014, both including cross-examination; Section 35 consultation to determine if treaty and aboriginal rights (of status, non-status, and Métis people) will be affected; and Sign-off of Environmental Protection Programmes by regulatory agencies, if required as a result of the environmental licensing process.

Ongoing processes for stakeholders to raise issues and get feedback will be: ongoing engagement between the KHLP partners (see P-2), and engagement through the Lower Nelson River Stewardship Committee involving the four KCN and also the Shamattawa Cree Nation; Routine community meetings of the KCN; A range of processes to involve community members in the monitoring of project impacts, including the Monitoring Advisory Committee (MAC, including KCN community representatives and particular groups such as youth and the elderly), involvement of members with ATK in scientific monitoring programmes; and site visits by elders; The continuation of the future-development team offices in each community, and a site Community Liaison Officer; Responses to the public disclosure of project information, via KHLP and other websites and an annual report (in a similar form to Wuskwatim annual reports); Meetings of the Technical Advisory Committee; Public Utilities Board, and Provincial Working Group meetings to engage on higher level policy issues; and MH's annual Water Power Act Licenses – Annual Water Levels and Flows Report (approved by a registered engineer) which is made available to the public; and Communications with MH staff with responsibilities for Keeyask through the internal team structures and management processes described under P-6.

**Criteria met: Yes**

### **Analysis against proven best practice**

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive and participatory; negotiations are undertaken in good faith; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

Engagement with directly-affected stakeholders has been highly inclusive and participatory. Examples that demonstrate this include: the inclusion of elders in the OWL working group, and more generally, KCN success in

involving all parts of their communities; The use of breakout groups in KCN consultations, for example youth groups, who may find it difficult to speak out in the presence of elders; the use of social media is being considered for providing updates to youth; Visits to elders to obtain their views in some communities; Making Cree translation available in KCN meetings for those who prefer to speak Cree (there are very few people who are not able to speak English); and Inclusion of trappers in the use of ATK for the Environmental Evaluation reports and ongoing monitoring.

Separate, bilateral processes are being used to understand the interests of Cross Lake First Nation, Manitoba Métis Foundation (MMF), and the Nisichawayasihk Cree Nation (NCN; Manitoba Hydro's partner on Wuskwatim). Consensus has not yet been reached with MMF on an anticipated work plan to research how Métis people make use of the area potentially-affected by the project, but this is not a significant gap at this stage. There are other communities, including aboriginal communities, where attempts to establish consultations through the PIP have not been successful, but this probably results from the absence of major interests in the project rather than a failure of the PIP.

Negotiations have been undertaken in good faith on the part of all partners. This has not been an easy process, given the legacy of mistrust. Broadly speaking, First Nation stakeholders interviewed during this assessment felt that MH has made great improvements compared to previous developments, indicating the good faith that has been built.

External interviewees agreed that feedback to directly-affected KCN and other stakeholders has been thorough and timely. In addition, feedback through the PIP is thorough: details, down to the level of letters sent and received from targeted stakeholders, are disclosed as part of the EIS, and summaries of rounds 1 and 2 are available on the KHLF website. Feedback at a community-level is provided by direct interaction with the future-development teams' offices.

Criteria met: Yes

## 1.2.4 Conformance / Compliance

### Analysis against basic good practice

**Scoring statement:** *Processes and objectives relating to communications and consultation have been and are on track to be met with no major non-compliances or non-conformances, and any communications related commitments have been or are on track to be met.*

Processes and objectives are on track to be met. Interviewees amongst regulatory agencies informed this assessment that there are no non-compliances with the regulatory requirements for consultation under environmental licensing or Section 35 to date. The communications commitments set out in the plans and processes described under Management above are on track to be met, and there are no non-conformances with MH's policies and principles, including the corporate vision, code of ethics and the principle of public participation, one of 13 of MH's Sustainability Principles.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, there are no non-compliances or non-conformances.*

There are no non-conformances or non-compliances. One regulatory agency described how MH is "one of the best" [in Manitoba] for carrying out consultation.

Criteria met: Yes



## 1.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 1.3 Scoring Summary

Stakeholder identification and engagement have been implemented very extensively, through a wide range of processes, principally concerning KHLP partners, KCN community members, and a broader group of external stakeholders and the public through the Public Involvement Programme.

Management processes, including the Monitoring Advisory Committee and the Keeyak Project Communication Protocol will be used to respond to risks and opportunities for good stakeholder relations as the project continues, and a response to the significant risk that stakeholders will see the project as MH-driven is addressed by the very formation of the KHLP partnership.

Stakeholder engagement is widely considered to have been successful, with KCN partners voicing the opinion that MH has made great improvements compared to previous developments. Engagement has been highly participatory and inclusive, and negotiations have been conducted in good faith. The quality of communications products disseminated through the KHLP website and the EIS is high. In addition, there is a range of processes for engagement that will continue into implementation and operation.

There are no significant gaps at the level of proven best practice, resulting in a score of 5.

Topic Score: 5

## 1.4 Relevant Evidence

<b>Interview:</b>	3, 5, 13, 26, 42, 49, 51, 58, 60, 62
<b>Document:</b>	1, 2, 3, 4, 5, 6, 18, 45, 46, 47, 55, 57, 59, 60, 61, 64, 67, 70, 73, 80, 81, 85, 101, 172, 173, 191, 193, 194, 195, 196, 197, 198, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210
<b>Photo:</b>	None



## 2 Governance (P-2)

This topic addresses corporate and external governance considerations for the project. The intent is that the developer has sound corporate business structures, policies and practices; addresses transparency, integrity and accountability issues; can manage external governance issues (e.g. institutional capacity shortfalls, political risks including transboundary issues, public sector corruption risks); and can ensure compliance.

### 2.1 Background Information

The Keeyask Hydropower Limited Partnership (KHLP) is the proponent of the Keeyask Infrastructure Project (KIP) and the Keeyask Generation Project (KGP), which will be developed as a collaborative effort between Manitoba Hydro (MH), a Provincial Crown Corporation, Tataskweyak Cree Nation (TCN) and War Lake First Nation (WLFN), the two acting as the Cree Nation Partners (CNP), York Factory First Nation (YFFN), and Fox Lake Cree Nation (FLCN). Collectively these First Nations are known as the Keeyask Cree Nations (KCN).

In May 2009, the parties signed the Joint Keeyask Development Agreement (JKDA), that governs how the project will be developed. This signing followed independent ratification votes by each KCN supporting its Chief and Council to proceed with the JKDA and individual Adverse Effects Agreements (AEAs) that address known and foreseeable adverse project effects through traditional and cultural programmes and other measures. The partnership board appointments are planned to be made at the start of the KGP construction, which is currently scheduled for June 2014. A third component of the overall Keeyask development is the Keeyask Transmission Project (KTP), which will be designed, contracted, owned and operated by MH.

The Keeyask projects' governance arrangements build on the experience of the recently completed 200 MW Wuskwatim project on the Burntwood River, which is being undertaken by a partnership of MH and the Nisichawayasihk Cree Nation. Another important element in designing the governance arrangements for the Keeyask project was the acknowledgement, through the Northern Flood Agreement (1977) and subsequent agreements between MH and individual Cree Nations, of the need to deal with legacy issues associated with the development of previous hydropower projects in Northern Manitoba.

When considering transparency and accountability, two of the principal pillars of good governance, Canada, and by extension the Province of Manitoba, is highly ranked. According to Transparency International's latest publication of the Corruption Perceptions Index (2012), which ranks countries on how corrupt a country's public service is perceived to be, Canada is ranked # 9 out of 174 countries and territories, being the highest of the G7 countries. Under the Bribery Perceptions Index, which ranks leading countries according to the perceived likelihood of their firms to bribe when seeking business abroad, Canada is ranked 8 out of 28 countries (2011).

Notwithstanding this, when reviewing corruption in the private sector, particularly as it relates to hydropower development, it bears noting that staff of Canada's leading engineering company have recently been charged with violating the Corruption of Foreign Officials Act, the statute that outlaws foreign bribery. This company is also under investigation for alleged bribery in North Africa as well as fraud in a large scheme in Canada. Consequently, Canadian companies cannot be considered immune from corruption.

Governance issues in this assessment will be discussed in the context of the Partnership as defined by the JKDA; it will also focus on MH, the managing partner of the KIP and the KGP, and also responsible for the KTP, as well as the roles of the accountability and regulatory agencies. This topic has considerable inter-relationships with, primarily, P-1, P-5 and P-12.

## 2.2 Detailed Topic Evaluation

### 2.2.1 Assessment

#### Analysis against basic good practice

**Scoring statement:** Assessments have been undertaken of political and public sector governance issues, and corporate governance requirements and issues, through the project development cycle with no significant gaps.

The JKDA is the culmination of nearly a decade of discussions relating to the governance arrangements for the Keeyask project. According to MH, the underlying principles framing these discussions (which also informed the Wuskwatim project development) include: working with affected communities as legitimate partners in a project's development; respecting local culture, traditions and knowledge throughout the planning and development process; working to provide opportunities for affected communities to benefit and build capacity through project-related employment, training and business opportunities; and ensuring that adverse effects of potential projects are acknowledged and addressed with affected communities in a mutually acceptable way prior to project development.

MH provided CAD 100 million over a 10-year period to the KCN to negotiate and ratify the JKDA. Its principal features are set out in the Management section below.

Extensive oversight of MH is being provided by the provincial accountability agencies including: the Standing Committee on Crown Corporations of the Legislative Assembly of Manitoba; the Ministry of Innovation, Energy and Mines (which is charged with the administration of the Manitoba Hydro Act); and the Crown Corporations Council. Provincial regulatory agencies include the Public Utilities Board (PUB), the Clean Environment Commission and Manitoba Conservation. In addition, as a Provincial Crown Corporation, MH is subject to The Freedom of Information and Protection of Privacy Act as well as The Public Interest Disclosure (Whistle-blower Protection) Act; complaints under both acts are under the administration of the Ombudsman Manitoba.

Examples of regulatory reviews/assessments of the KGP, which are on track to be made, include: an environmental assessment under the Canadian Environmental Assessment Act, followed by further consideration by federal regulatory ministries such as the Department of Fisheries and Oceans (DFO); and an environmental assessment under The Environment Act (Manitoba), with public hearings conducted by the Clean Environment Commission. The project will also be included in review of the need for and alternatives to Manitoba Hydro's major new projects, including Keeyask, Conawapa, and a new transmission interconnection to the United States, plus major export contracts. This review will be conducted by a PUB panel which will also hold public hearings. The Crown Corporations Council oversight of Manitoba Hydro, includes advising the Treasury Board on supporting the KGP and other elements of Manitoba Hydro's investment programme.

MH (under the leadership of the Human Resources and Governance Committee of its board) pays continuing attention to assessing corporate governance risks. The MH board models its approach to corporate governance on best practices in Canada, the United States and Great Britain. The board ensures that the corporation's Code of Ethics and aspects of ethics and social responsibility are considered in board decisions. Minutes of board meetings are public, and the corporation's annual report and quarterly financial statements are tabled in the provincial legislature.

General MH governance activities are led by the VP of General Counsel & Corporate Secretary, while the KHLPP governance is led by the Senior VP of Power Supply. Interdepartmental peer review is used to assure a high quality of various initiatives, such as MH's regularly published risk-management reports, which include a focus on governance, regulatory and legal issues.

Criteria met: Yes

## Analysis against proven best practice

**Scoring statement:** *In addition, there are no significant opportunities for improvement in the assessment of political and public sector governance issues and corporate governance requirements and issues.*

At present there are no apparent significant opportunities for improvement in the assessment of political and public-sector governance and corporate-governance requirements and issues. It is, however, prudent, as MH does, to follow an adaptive management approach to respond to emerging issues, as they may arise.

Criteria met: Yes

## 2.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Processes are in place to manage corporate, political and public sector risks, compliance, social and environmental responsibility, grievance mechanisms, ethical business practices, and transparency; policies and processes are communicated internally and externally as appropriate; and independent review mechanisms are utilised to address sustainability issues in cases of project capacity shortfalls, high sensitivity of particular issues, or the need for enhanced credibility.*

This section first focuses on the management aspects of KHLP governance (as set out in the JKDA) and then on MH governance.

The JKDA consists of 24 Articles and 42 Schedules. Some of the principal features relate to:

The Partnership, including representation on the Board of the General Partner; the Advisory Committees (Construction Advisory Committee and a Monitoring Advisory Committee);

Equity and debt-capital requirements as well as arrangements for their management; the management, construction and operating services to be provided to the Partnership by MH, and power purchase arrangements;

MH, through its wholly owned subsidiary 59000345 Manitoba Ltd. will manage and operate the Partnership and will be liable for all its debts. It will contract MH to design, construct and run the KGP as part of MH's integrated power system, as well as source financing for its construction; and

MH and the KCN will be responsible for the preparation of the EIS for submission to the Regulatory Authorities, with the Partnership as the proponent.

The JKDA also sets out: the conditions for starting Project construction, including timing; that the partnership and MH will enter into arrangements with each KCN to address adverse effects arising from the Keeyask Projects (KIP and KGP) on the terms set out in the KCN AEAs; and Employment, training and business opportunities for KCN Members. This include pre-project training; construction employment (includes a target of six hundred and thirty (630) person-years of employment); operational jobs (includes a 20-year target of 182 full-time operational jobs at MH, including jobs at the ongoing operations of the KGP). In addition, several construction (including the North and South Access Roads), services, labour and materials "work packages" i.e. contracts (at an estimated cost of CAD 203.1 million in July 2007 dollars) are being offered to the KCN as DNCs.

As explained above, through its own internal programmes and processes, MH (acting on behalf of the partnership) acts to minimise corporate risk. The company promotes ethical business practices and transparency through its Code of Conduct as well as its Integrity Program on which it reports in its Annual Report. Conflict-of-interest policies are in place for members of the board, officers, and employees.

As delegated by the Partnership, MH will manage a comprehensive monitoring and follow-up programme to confirm that work on the Keeyask project comply with regulatory requirements. The KCN will be directly involved in monitoring implementation of the KIP and the KGP through leading the aboriginal traditional knowledge (ATK) monitoring programmes as well as working side-by-side with the team managing the technical

science-based monitoring. The Monitoring Advisory Committee (MAC), with KCN and MH representatives, will review the outcomes of programmes in the Environmental Protection Plan and, if appropriate, may provide advice and recommendations to the Partnership on additional or alternative mitigation measures that may be required.

Grievance mechanisms are in place particularly involving MH and the KCN communities. DNCs between MH and the KCN include grievance mechanisms. Detailed procedures are set out in the JKDA (e.g. in Article 13.5 which refers to Mediation and Arbitration).

Policies and processes are generally communicated appropriately, both externally and internally. External communications appear to be excellent with the project's directly affected stakeholders, including between MH and the KCN. Communications between MH and the provincial accountability and regulatory agencies appears good. In relation to infrastructure safety, while there is appreciable information set out in the KHP EIS, additional information could be released explaining how these issues are handled in the context of MH's Dam Safety Program. Internally, within MH, the Board sets an excellent example by making the minutes of its meetings public, therefore any member of the public can access the minutes of board meetings.

In 2014, each individual KCN will decide whether to invest in the project as part owners. If they decide in favour, a small investment has to be made before the start of construction, but the major part will only have to be made at the end of construction and start of operation, when revenues would also start accruing. Unlike with the AEAs (where there is ongoing significant consultation with the KCN Members), there is, so far, a lack of a requirement that a plan be developed to manage the profits/dividends paid by the KHP to the KCN based on consultations with the KCN Members. Such a plan should make sure that members are regularly informed about the plan's progress through audited reports, and consulted on significant modifications to the plan. This is regarded as a non-significant gap at this stage, as there is plenty of time to develop such mechanisms, if a decision to invest is made.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, contractors are required to meet or have consistent policies as the developer; and processes are in place to anticipate and respond to emerging risks and opportunities.*

Even though MH takes many measures to be an ethical organisation, as mentioned under P-12, contract documents (including pre-qualification documents) do not explicitly address corruption risks nor are these emphasised in procurement planning. This gap has been scored as a significant gap under P-12.

In relation to sustainability, MH issues its Environment Protection Plan (EPP) with its tender documents and expects the bidders to provide their EPPs to ensure that they provide evidence that they can adhere to MH's requirements. To date, Manitoba Hydro does not explicitly screen for companies to have sustainability policies within their own organisations.

Processes are in place (e.g. in procurement) to manage emerging risks and opportunities.

Criteria met: Yes

## 2.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The business interacts with a range of directly affected stakeholders to understand issues of interest to them; and the business makes significant project reports publicly available, and publicly reports on project performance, in some sustainability areas.*

Extensive communication efforts have been undertaken by MH with directly-affected stakeholders, particularly the KCN, to understand issues of interest to them. Significant project reports, including a very comprehensive

EIS are publicly available. The KHLPP has set up a web site, where updated project information is available. The partnership plans to report on project performance in a wide range of sustainability areas. While MH is rated very highly in consumer satisfaction, communications with its consumers on the positive benefits of Keeyask may be hampered by the ongoing controversy on the Bipole III project, which consumers may conflate with the Keeyask project.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the business makes significant project reports publicly available and publicly reports on project performance in sustainability areas of high interest to its stakeholders.*

Significant project reports are publicly available, such as the comprehensive EIS and the JKDA. Further significant project reports, including economic analyses reports, are expected to be released as the project goes through the NFAT review. The KHLPP plans to publicly report on project performance including the KHLPP Annual Report, the annual Monitoring Overview report that includes information on the Environmental Protection, the Environmental Management and Environmental Monitoring Plans, which will include areas of high interest to its stakeholders (such as fish habitat and heritage resources).

Criteria met: Yes

## 2.2.4 Conformance / Compliance

### Analysis against basic good practice

**Scoring statement:** *The project has no significant non-compliances.*

There are no non-compliances.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *The project has no non-compliances.*

See statement above under basic good practice.

Criteria met: Yes

## 2.2.5 Outcomes

### Analysis against basic good practice

**Scoring statement:** *There are no significant unresolved corporate and external governance issues identified.*

Through externally monitored ratification votes, the AEAs and the JKDA acquired legitimacy in each KCN. The process of reaching agreement on the JKDA between MH and the KCN has been fair with respect to the AEAs and the employment and business opportunities, including regarding the benefits that would accrue to the KCN. Moreover, the JKDA promotes a fair approach to resolving issues between the parties through its provisions for expert review and dispute resolution.

As explained above, MH, a Provincial Crown Corporation, operates in the Province of Manitoba, which has very low political and public sector risks. There are no significant unresolved issues between MH and the provincial accountability and regulatory agencies regarding Keeyask in particular, nor with the corporation in general.

There are no significant unresolved corporate and external governance issues identified.

Criteria met: Yes

## Analysis against proven best practice

**Scoring statement:** *In addition, there are no unresolved corporate and external governance issues identified.*

As noted above under Management, there is one KHLPI-internal unresolved corporate-governance issue regarding management of revenue, should the individual KCN decide to enter into full ownership of the Keeyask project. Unlike with the AEAs, there is a lack of a requirement that a plan be developed to manage the profits/dividends paid by the KHLPI to the KCN based on consultations with the KCN Members. Such a plan should ensure that members are regularly informed about its progress through audited reports, and consulted when significant plan modifications are needed. Since a decision to invest in the project will only be made in 2014, and revenues only accrue when the project becomes operational, there is still plenty of time to develop such mechanisms. This is, therefore, regarded as a non-significant gap.

Criteria met: Yes

## 2.2.6 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice

0 significant gaps

## 2.3 Scoring Summary

The Keeyask project is noteworthy for the attention paid to governance issues in setting up the KHLPI. Through externally monitored ratification votes, the AEAs and the JKDA acquired legitimacy in each KCN. Moreover, through its provisions for expert review and dispute resolution, the JKDA promotes a fair approach to resolving issues between the parties.

In addition to being subject to extensive oversight by provincial regulatory and accountability agencies, MH – the managing partner (under the leadership of its Board) – has instituted and reports on extensive policies and processes to promote good governance within its organisation. There is a high level of public reporting and disclosure, including on issues of high interest to stakeholders. For procurement, processes are in place in the KIP and KGP to manage emerging risks and opportunities.

There are no significant gaps against proven best practice, resulting in a score of 5.

Topic Score: 5

## 2.4 Relevant Evidence

<b>Interview:</b>	1, 5, 33, 35, 64
<b>Document:</b>	1, 12, 18, 23, 24, 46, 47, 57, 70, 90, 108, 109, 116, 131, 184, 185, 186, 187, 188, 189, 190
<b>Photo:</b>	None

## 3 Demonstrated Need and Strategic Fit (P-3)

This topic addresses the contribution of the project in meeting demonstrated needs for water and energy services, as identified through broadly agreed local, national and regional development objectives and in national and regional policies and plans. The intent is that the project can demonstrate its strategic fit with development objectives and relevant policies and plans can be demonstrated, and that the project is a priority option to meet identified needs for water and energy services.

### 3.1 Background Information

The Provincial Government of Manitoba has conducted a strategic planning exercise for both energy and water sectors. There is also an IWRM strategy in place to address the focal areas of water-resources-related issues in the Province.

The Keeyask project is the latest to go through licensing in a long line of hydropower developments in the Nelson river catchment. The Nelson catchment, along with others in northern Manitoba, has been significantly altered in order to facilitate hydropower generation. To this end, the strategic long-term planning in the province of Manitoba has resulted in actions such as the Lake Winnipeg Regulation (LWR), the Churchill River Diversion (CRD) and several hydropower plants on the lower Nelson. Most recently Manitoba Hydro has entered into a process involving three projects, Wuskwatim, Keeyask and Conawapa. Wuskwatim is already constructed (finished during 2012) and Conawapa is the next-in-line project after Keeyask, with a target date for commissioning set to 2025.

The responsible Manitoba ministry for the energy sector is that of Innovation, Energy and Mines which has a Division for Energy. The Minister for this ministry is responsible for Manitoba Hydro. The Energy Division is responsible for setting the broad energy policy and for facilitation of energy-project developments, but the detailed energy-sector expansion planning responsibilities rest with Manitoba Hydro.

Manitoba is also active in the ongoing work on a national energy strategy, advocating a strengthened east-west grid in order to improve grid security and further optimise the efficiency of the system.

The provincial “Clean Energy Strategy” and the “Tomorrow Now” initiative (aiming for a new law titled “Green Prosperity Act”), focus on the concepts of renewable and fossil-free. The highest priority is put on demand-side management (DSM) with the highly visible Power Smart programme. Hydropower is seen as the main provider of additional capacity needed to support the growing needs in Manitoba. Around 1 000 MW of wind power is also technically feasible, but development depends on economic considerations. Creating revenue by exporting clean energy to neighbouring provinces within Canada, and also across the border to the mid-western states of the USA is also considered an important priority. Manitoba Hydro’s energy is attractive for export markets due to its climate-benign nature.

This topic is closely inter-related to P-4 and P-11. P-4 covers the strategy-related design choices and P-11 deals with the strategic fit for Keeyask in terms of economic viability, as part of Manitoba Hydro’s power resource plan.

### 3.2 Detailed Topic Evaluation

#### 3.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment has been undertaken of needs for water and energy services, of options to meet water and energy needs; and of national and regional policies and plans relevant to those needs, with no significant gaps.*



Manitoba Hydro's planning objectives are: secure resources to meet future needs; meet committed firm sales and; lowest possible economic cost to customers. Socio-environmental concerns are seen as a cross-cutting priority.

The Keeyask project is specifically mentioned as a priority development in the provincial strategy document, together with the Conawapa project, planned for farther downstream on the Nelson River. The Government has mandated the portfolio approach to development used by Manitoba Hydro, with groups of projects being analysed as alternative packages for development. Keeyask is the only project which can be implemented to meet the 2022 domestic requirements together with current export-market opportunities.

Manitoba Hydro produces a Power Resource Plan on an annual basis. This plan is publically available, with the exception of the detailed Resource Options study which is confidential for business reasons. The Resources Options study reviews both demand-side and supply-side options in detail with a strong focus on socio-environment aspects of the various options.

The Environment Impact Statement (EIS) responds to the Sustainable Development Act, a process which involves triple-bottom-line considerations.

The national energy strategy is under development and is likely to be supportive of Manitoba's initiatives as they lower the GHG footprint of the Canadian electricity sector. The provincial strategies for both water and energy services are well internalised in the power-resource planning work

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment is based on dialogue with government planners, policy makers and key stakeholder groups; and the assessment shows a strong emphasis on social and environmental related needs, policies and plans including the need for sustainable development of the river basin and integrated water resource management.*

Government planners in the provincial Energy Division within the Ministry of innovation, Energy and Mines are responsible for strategy and policy. They strongly endorse development of the Keeyask project to meet both domestic and export needs. Other key stakeholder groups are involved and consulted as part of a number of ongoing and up-coming processes, such as the environmental licensing, the "Need For and Alternatives Too" (NFAT) and the Clean Environment Commission (CEC) hearings. Among other sub-components that will be part of the NFAT process is a so called multiple-account cost-benefit analysis (MACBA) of Manitoba Hydro's Proposed Resource Development Plan (see P-11 for more detail). A similar analysis was also performed in the case the Wuskwatim project, and the experience from there will go into refinement of the approach for coming projects.

The NFAT process has become the chosen approach for how to deal with provincial Government approval of new major projects in Manitoba. The timing and form of the NFAT is at the provincial Government's discretion. The NFAT process for Keeyask will also include the Conawapa project, responding to the portfolio approach mentioned above.

Socio-environmental needs are key aspects reviewed by these processes. The development of hydropower in northern Manitoba addresses more of the Province's strategic needs than just water and energy. The hydropower projects make resources available for regional development, skills development and training for people of aboriginal origin and provide business opportunities for the First Nation partners, see more details under P-10.

Policies and strategies are strongly linked to sustainability through the initiative to pass the "Green Prosperity Act" and IWRM is internalised in the province's water strategies.

Criteria met: Yes



## 3.2.2 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The results of the assessment of strategic fit are publicly disclosed.*

The 2011/12 Power Resource Plan is a public document and contains the result of Manitoba Hydro's prioritisation process.

The project will also be subject to a CEC hearing, a public process and the Public Utilities Board will subject Keeyask (jointly with the Conawapa project) to an NFAT process before any license is awarded. This procedure includes extensive public consultations and internalises economic, social and environmental aspects.

The combination of these processes will result in a comprehensive assessment of strategic fit, available and subjected to public scrutiny and acceptance.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *No addition to basic good practice.*

Not assessed.

Criteria met: Yes

## 3.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *The strategic fit of the project with needs for water and energy services, and relevant policies and plans can be demonstrated.*

The Environment Impact Statement (EIS) responds to the Sustainable Development Act, a process which involves triple-bottom-line considerations.

The NFAT and the CEC hearings will put this strategic fit, demonstrated by the provincial strategies and Manitoba Hydro's Power Resource Plan, to the test. Comprehensive preparation has taken place for the two hearings with public strategic review, meaning these criteria are on track to be met.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition the project is one of the priority options to address demonstrated needs.*

The recommended development plan in the 2011/12 Power Resource Plan is headed by the Keeyask project. It is the highest-ranked option after DSM.

The Provincial Government supports the development of Keeyask as the priority development option.

Criteria met: Yes

## 3.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 3.3 Scoring Summary

Demonstrated need and strategic fit are addressed by the provincial strategy documents on energy and water respectively and Manitoba Hydro's power resource plan, all of which are publicly available documents.

The public will get ample opportunities to review and give opinions on the need and strategic fit of the Keeyask project through the up-coming NFAT and CEC hearings. The project will undergo a MACBA as part of the NFAT.

The project is the highest ranked development option after DSM.

There are no significant gaps at the level of proven best practice, resulting in a score of 5.

Topic Score: 5

## 3.4 Relevant Evidence

<b>Interview:</b>	1, 16, 21, 23, 43, 45, 49, 51, 58, 66
<b>Document:</b>	8, 57, 61, 70, 119, 124, 128, 137, 138, 141, 159, 163
<b>Photo:</b>	None

## 4 Siting and Design (P-4)

This topic addresses the evaluation and determination of project siting and design options, including the dam, power house, reservoir and associated infrastructure. The intent is that siting and design are optimised as a result of an iterative and consultative process that has taken into account technical, economic, financial, environmental and social considerations.

### 4.1 Background Information

The development work on the Keeyask project is part of a portfolio of projects including the Wuskwatim project on the Burntwood River (finished in 2012) and the Conawapa project located downstream from Keeyask on the Nelson River. The design options have been partially limited by the well-defined remaining hydraulic heads on the lower Nelson river. When planning started, the development potential for Keeyask concerned 27 metres of head between Split Lake at the upstream end and Stephens Lake at the downstream end. The project will utilise 18 of these 27 metres.

This topic is inter-related to P-3, which deals specifically with the strategic fit of the Keeyask project in terms of Provincial policies, rather than project design. It also relates to P-9 and P-11 due to the comparatively high cost of the project in terms of cost-per-installed-MW. General consultations and communication on the project is covered in detail in P-1.

### 4.2 Detailed Topic Evaluation

#### 4.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *Technical information has been analysed at an early stage alongside social, environmental, economic, financial, and regulatory considerations in order to develop a preliminary project design and some options around this.*

The Government of Canada, the Province of Manitoba and Manitoba Hydro conducted a “Stage I” study (resource inventory) for the lower Nelson River in the 1960s. This was followed by “Stage II” studies (feasibility) from the 1970s to 1998. During the 1970s and early 1980s the focus was on various layouts for developments at Birthday Rapids and Gull Rapids. In 1987, a reconnaissance study of available construction materials was undertaken in the area. During the late 1980s to the early 1990s the focus was on three different development options, but options with an even lower FSL than those three were also studied. It was determined that going below 158 m.a.s.l., the economics of the project became untenable. In 1992 a decision was made to work together with Tataskweyak Cree Nation (TCN) with the “Joint Studies Program” (JSP), which also included a “post-project environmental review” looking at the impacts of past projects in the region. As a result of concerns raised by TCN and in consideration of potential requirements for mitigation measures, the high-head option for development was abandoned in 1996.

In 1998, TCN suggested that they and Manitoba Hydro (MH) jointly should explore options for a mutually beneficial development of the project. In response, MH introduced a new corporate approach to joint development, enabling potentially affected Aboriginal communities to participate in the ownership of the Keeyask project (an approach which was also used for the Wuskwatim project).

In 1999 a definite decision to go with only one power plant with low head at Gull Rapids was made, based on the need to limit flooding to upstream areas.

Stage IV work (preliminary engineering) was then started. This phase was based on the Stage II decision to have a *minimum* FSL of 158 m.a.s.l. This was raised to 159 m.a.s.l. for two principal reasons: reservoir ice formation

concerns and the fact that this 1 metre of additional operating head would increase the average annual energy produced by 6%, a significant contributor to economic viability for the project.

In the year 2000, the Agreement In Principle (AIP) was signed by MH and TCN. The name change, from Gull Rapids to Keeyask (gull in the Cree language) took place shortly thereafter. The design studies for Keeyask were stepped up, and during the period up to 2009 a Project Description Committee (with participation from all KCN) discussed and made recommendations on fundamental features of the projects, such as access-road corridors, siting of the power house, spillway and water levels.

In 2002 the studies also concluded that most factors favoured the so called GR4 option for dam alignment.

An initial presentation was made to regulators in 2005; regular interaction with relevant regulators started in 2009 (following signing of the JKDA) to discuss project development and receive feedback on design features and suggestions for adjustments. This interaction is ongoing.

2012 – the project moved into Stage V, Final Design and Construction.

The project has studied a large number of alternatives for most project parameters – choice of turbines, multiple dam sites and configurations, multiple dam-axis alignments as well as detailed studies of dyke alignments and extension, alternative routes for access roads and power evacuation as well as borrow areas and deposit locations for construction and spoil materials respectively.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, options take into consideration sustainable river basin design and integrated water resource management.*

The Keeyask project is planned for one of the last remaining undeveloped heads on an already strongly developed river, from a hydropower point of view. In addition, the design process has clearly favoured multiple-use benefits and the priorities of concerned stakeholders. The agreed-upon design avoids flooding of any settlements and thereby avoids resettlement. The involvement of the KCNs have steered the design process strongly in favour of sustainability given their World View with its clear understanding of all things as inter-related.

Criteria met: Yes

## 4.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *An optimisation process has been undertaken to assess the project siting and design options.*

A clear iterative process has been followed where two original main development concepts, the intermediate and full developments of the Birthday and Gull Rapids were scrapped in favour of an even lower-impact low-head option mainly affecting Gull Rapids and with no impacts on lake levels on Split Lake during open-water conditions.

Following the decision favouring a low-head development at Gull Rapids, there has been a continued iterative process reviewing options to limit negative impacts and enhance positive ones.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *No addition to basic good practice.*

Criteria met: Yes

## 4.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The siting and design optimisation process has involved appropriately timed, and often two-way, engagement with directly affected stakeholders; ongoing processes are in place for stakeholders to raise issues and get feedback.*

The stakeholder engagement has been intense, two-way, in good faith and going on for about 20 years. The various agreements, such as the Joint Studies Program, the AIP and the JKDA, clearly defined/defines opportunities for how stakeholders can raise issues and receive feedback. Reference groups have been able to provide input to the drafting of the JKDA as well as the step-wise design process.

MH has produced illustrative materials to show-case the design options, thereby facilitating stakeholder engagement in an effective manner.

The future-development offices, the environmental working group and, in the future, the Monitoring Advisory Committee (MAC) provide the four First Nations involved in the project with ongoing access channels for raising issues and getting feedback on issues relevant to siting and design.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive, and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

The KCN have been involved in the development from an early date. Major decisions on design options have focussed on sustainable development and have been in agreement between the key interested parties. . As far back as 1994, a presentation (in English and Cree) was presented to the Split Lake community as part of the Joint Studies Program, providing information on several options for hydropower development in their immediate area to act as basis for the continued co-operative efforts to agree on a suitable and agreeable design. The KCNs have also conducted their own evaluation processes and produced what have been called “Supporting Reports” or “Evaluation Reports”, based on the Cree World View, to guide the detailed design.

Inclusive and participatory engagement is confirmed by all four KCNs. Feedback is provided through the future-development offices. In addition to this, there is ongoing two-way contact between individuals from MH and the KCNs.

Criteria met: Yes

## 4.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *The final project siting and design has responded to many sustainability considerations for siting and design.*

The selected development option, in terms of both siting and design, has primarily been chosen in response to social and environmental concerns of the KCN, focussing on limiting negative impacts on their livelihoods and spiritual appreciation of their home environment. This has been accomplished both through the early-stages co-operative development work under the Joint Studies Program, but also importantly through the KCNs’ own environmental assessments.

Economic considerations have been satisfied mainly through a defined lowest-possible reservoir level which would be economically feasible. As a result of ongoing studies and discussions, the FSL of the reservoir was also

raised at a late stage of design optimisation, from an initial decision of 158 m.a.s.l. to 159 m.a.s.l., in order to secure the economic viability of the project.

The consultations and adjustments to siting and design have also fully included the ancillary infrastructure such as access roads and transmission lines for power transmission to the switchyard, with many changes made to the original layout as a result of sustainability concerns.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *The final project siting and design is optimal with respect to sustainability considerations for siting and design.*

It is clear that the long, iterative, inclusive and participatory design process has created a project siting and design that can be considered optimal when all sustainability criteria and all stakeholder perspectives are factored in.

The fact that the project has a high dollar price per MW of installed capacity in an international perspective is discussed under P-9 and P-11.

Criteria met: Yes

## 4.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 4.3 Scoring Summary

The potential for a hydropower development at approximately the Keeyask site on the lower Nelson river was first defined by a federal and provincial study in the 1960s. Since the early 1990s, the design optimisation for Keeyask has been conducted in co-operation with project-affected First Nations, initially only TCN, but later also WLFN, YFFN and FLCN.

The design optimisation has been an iterative process looking at a score of alternatives for turbines, dam-site location and project configuration, dam-axis alignments, dyke alignments, access roads, power evacuation, borrow areas and spoil-material deposits. Social, environmental and economic arguments and considerations have governed the choices made and resulted in an optimal design for the site, given the inherent limitations.

Consultation and active, meaningful participation of the project-affected First Nations has been well integrated into the process, helped by the existence of the future-development offices in each of the four KCNs.

Topic Score: 5

## 4.4 Relevant Evidence

Interview:	1, 8, 11, 26, 39
Document:	5, 27, 47, 56, 57, 58, 59, 60, 61, 62, 63, 64, 67, 70, 73, 85, 126, 127, 139, 141
Photo:	1, 2, 3, 14, 15, 16, 17

## 5 Environmental and Social Impact Assessment and Management (P-5)

This topic addresses the assessment and planning processes for environmental and social impacts associated with project implementation and operation throughout the area of impact of the project. The intent is that environmental and social impacts are identified and assessed, and avoidance, minimisation, mitigation, compensation and enhancement measures designed and implemented.

### 5.1 Background Information

Canada and the province of Manitoba have well developed regulatory systems that include public access to information and opportunities to contribute to the approvals process. Both jurisdictions have extensive experience in the assessment, permitting and management of hydropower systems.

The Keeyask project is subject to regulatory review and approvals by federal and provincial authorities, and its environmental and social effects have been assessed in accordance with guidelines issued by the authorities. The Keeyask Hydropower Limited Partnership (KHLP) has undertaken assessments of the Keeyask Generation Project (KGP) and the Keeyask Infrastructure Project (KIP), while Manitoba Hydro (MH), as the proponent of the transmission component has undertaken that assessment. The KGP and KIP assessments have been prepared with the direct involvement of the four Keeyask Cree Nations (KCN) and input from the Public Involvement Program (PIP).

The Keeyask Infrastructure Project (KIP) component (comprising the northern access road and other preparatory works) has been licensed and is under implementation. The KGP and the Keeyask Transmission Project (KTP) components are currently undergoing regulatory review and public consultations. In the consultation process, the rights of indigenous peoples under the Canadian constitution receive special attention.

An unusual feature of the assessment process is that the KCN have undertaken and disclosed their own parallel assessments, based on Aboriginal Traditional Knowledge (ATK), of the Keeyask project as a basis for their own decisions on the compensation and partnership agreements.

A separate provincial-level process is underway for demonstrating the need for the Keeyask Project and evaluating alternative options for meeting those needs. This is addressed under topic P-3. Communication and consultation is dealt with in detail in P-1. Many other topics also look at assessment and management of environmental and social issues. The detailed evaluation is dealt with under those topics, and the overall analysis of assessment and management processes is covered here.

### 5.2 Detailed Topic Evaluation

#### 5.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *Assessments of project environmental and social impacts have been undertaken for project implementation and operation, including evaluation of associated facilities, scoping of cumulative impacts, role and capacity of third parties, and impacts associated with primary suppliers, using appropriate expertise and with no significant gaps; and a baseline has been established and well-documented for the pre-project condition against which post-project changes can be compared.*

While preparatory studies for the environmental and social assessment have been conducted since the project was identified, the formal assessment process for regulatory review and approvals involves preparation,

submission and review of scoping documents, assessment reports, and management and monitoring plans before licenses are issued. A number of provincial and federal departments contribute to this complex process, largely coordinated by the Manitoba Conservation and Water Stewardship Department (MCWS).

The assessment reports are comprehensive and detailed, reflecting the experience within MH and the KCN, their consultants, and public authorities with hydropower development. The assessments have also benefitted from the experience with MH's and the Nisichawayasihk Cree Nation's recent Wuskwatim hydropower project, which in many respects is similar to the Keeyask project. MH has set up organisational units and coordination processes for the preparation of the project.

Baseline data are well documented. They refer to the currently existing pre-project environmental and social conditions, which have been significantly modified from a natural or historical state by MH's previous developments upstream and downstream of the Keeyask project. Examples for this are the increased flow in the Nelson River, resulting from the partial diversion of the Churchill River into the Nelson, and the history of social disruption.

Cumulative impacts are addressed in the individual assessment reports for the project components and take previous and future hydropower and transmission projects in the region into account. Given the scope of MH's investment programme in northern Manitoba, a separate high-level study encompassing all development options in the form of a Strategic Environmental Assessment could have been useful for decision support; however, the technical information required to assess how the impacts of different projects and components overlap spatially and temporally is provided.

The impacts of primary suppliers are directly assessed for aggregates which are produced on site. Cement and steel are analysed in terms of the greenhouse-gas (GHG) emissions from their production for a life-cycle analysis of the GHG implications of the project. Most suppliers would be subject to Canadian or comparable environmental and social regulations. Impacts of primary suppliers could also be assessed through sustainability requirements in procurement; however this is not done systematically by MH (this gap is addressed under P-12).

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition the assessment takes broad considerations into account, and both risks and opportunities; and the social impact assessment incorporates assessment of human rights.*

The assessments cover a broad range of issues regarding physical, terrestrial, aquatic, and socio-economic environments, as well as cultural issues such as resource use and cultural heritage. Risks and opportunities have been analysed comprehensively to identify avoidance, mitigation, compensation and enhancement measures. For example, in the case of aquatic biodiversity, fish as well as macro-invertebrates, phyto- and zooplankton and macrophytes have been extensively studied and the effects of the impoundment on their populations modelled during construction and operation, as well as overlaid with other influences such as rising temperatures and shorter ice cover periods. Results informed management measures in particular for target fish species of high ecological and cultural importance.

While there is no specific assessment against human rights, the assessments and the consultation process are undertaken in a manner that is aware of and consistent with human rights, in particular the rights of the First Nations. Their rights are better protected in Canada than in most countries, and they have been given the choice to reject or support and become partners in the project. Worker interaction with communities, which in the past has been a source of violations of rights and social disruption, will be controlled to protect individual rights. Labour rights in the project are protected by Canadian legislation and are also supported by the collective bargaining agreement covering this and other MH projects in the region, the Burntwood Nelson Agreement. See also P-16.



## 5.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Environmental and social issues management plans and processes have been developed with appropriate expertise (internal and external) for project implementation and operation with no significant gaps; in addition to key social and environmental issues relating to the hydropower project, plans address construction related waste, noise, air quality, land disturbance and rehabilitation; the environmental and social impact assessment and key associated management plans are publicly disclosed.*

For all components of the project, a series of plans have been or are on track to be developed including Environmental Protection Plans (EPPs), Environmental Management Plans, and Environmental Monitoring Plans. These place special emphasis on impacts designated as important (Valued Environmental Components, or VECs) in the regulatory Environmental Impact Assessment (EIA) process and/or raised by the KCN in their parallel EIAs. Studies have followed standard practice by identification of impacts, formulation of mitigation measures, evaluation of residual impacts after mitigation, and designing management measures to compensate for residual impacts. An example for this iterative process is how spawning habitat for fish was identified, infrastructure design was adjusted, and residual impacts will now be compensated by constructed habitat.

Plans, tender documents and contracts include detailed and comprehensive provisions on environmental management during construction. Rehabilitation of land will continue for two years after commissioning of the last unit.

The assessment reports have been publicly disclosed on the internet and are also being made available in hard copies in public registries which are located in a number of Manitoba communities, including northern communities. Some documents have been summarised and translated into the Cree language for culturally appropriate dissemination and consultation.

The protection, management and monitoring plans are still under preparation (with the exception of those for the ongoing infrastructure component of the project) and on track for public release shortly; these will be finalised once feedback is received and licensing conditions are known. The Keeyask EPP will be a part of the tender documents provided to potential contractors, and will be part of the awarded contract.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities; plans are embedded within an internationally recognised environmental management system which is third party verified, such as ISO 14001; and independent review mechanisms are utilised.*

The baseline studies and identification of VECs which are affected by the project are the basis for the design of a comprehensive monitoring program. Results from the monitoring programme will guide adaptive management measures; adaptive management requirements against desired outcomes are also defined under the licenses and authorisations. Examples for opportunities to enhance pre-existing conditions include employment and business opportunities for KCN communities, fishing in lakes and rivers away from the Nelson River to avoid elevated mercury levels, and Lake Sturgeon management on the Lower Nelson. In each of these cases, the project has processes in place to identify specific measures during implementation and operation. Funding for any such measures which cannot yet be defined in detail, will be available from contingencies in the project budget and from other sources, which could include the KCN Adverse Effects Agreements (AEA).

MH maintains an Environmental Management System registered to the ISO 14001 standard and the Keeyask project is included within the scope of this system.

The robustness and credibility of the environmental and social assessment has benefited from review by the KCN and their consultants; however such review would not qualify as independent since they have since become partners and co-proponents of the project. The main independent review mechanism is the review performed according to the federal and provincial governments' legislation for environmental assessment, processes that include public participation and funding for public participants. Both the federal and provincial entities have technical specialists. Non-governmental independent review has also been carried out for specialist topics such as bio-accumulation of mercury in fish, climate change and the erosion and sedimentation study.

Criteria met: Yes

### 5.2.3 Stakeholder Engagement

#### Analysis against basic good practice

**Scoring statement:** *The environmental and social impact assessment and management planning process has involved appropriately timed, and often two-way, engagement with directly affected stakeholders; ongoing processes are in place for stakeholders to raise issues and get feedback.*

The assessment and approvals process involves a range of opportunities for public engagement and input. Before formal submission of the assessment reports in July 2012, these included assessments, consultations and negotiations with directly-affected local communities culminating in the 2009 AEAs, and the decisions to join the Partnership; the PIP; and public commenting on the scope of the assessment.

After formal submission, consultations include the ongoing or up-coming public commenting on the assessment reports (responses to the first round of comments have recently been published), public hearings to be conducted by the Clean Environment Commission once the technical review is finalised, Crown Consultation with First Nations and Métis under Section 35 of the Constitution, and the Need-For-and-Alternatives-To (NFAT) review. All of these processes involve extensive two-way engagement with stakeholders. Issues of public concerns and comments can also be brought in through MH's and the KCN's regular (non-project specific) governance and stakeholder engagement processes. In the case of MH, the Public Utilities Board and the Crown Corporations Council are two institutions through which questions on the Keeyask project can be raised. Ultimately, the democratic process in the province of Manitoba should ensure that MH as a Crown Corporation only undertakes major projects which have broad support.

Criteria met: Yes

#### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

The stakeholder engagement in the Keeyask project has been unusually inclusive in that it has resulted in the directly-affected communities joining with the original project sponsor MH in a formal partnership, with the option to become equity partners. It also resulted in changes to the size, location, and name of the project, as well as the compensation and benefit arrangements.

Funding and logistical support from MH as well as from public authorities allow stakeholders to participate meaningfully in the assessment and consultation processes. This includes funding for advisors and consultants to conduct parallel assessments or to research specific issues, to challenge the results of MH's assessments, and to negotiate with MH where appropriate. This is particularly relevant for First Nations. The parallel assessments conducted by each of the KCN using ATK, contributed to a high degree of understanding, involvement and self-determination within the directly-affected communities; groups such as elders,

knowledge holders, and women are encouraged to participate; project design and contractual arrangements are a major political issue in each of the KCN and receive ongoing attention.

Criteria met: Yes

## 5.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Environmental and social plans avoid, minimise and mitigate negative impacts with no significant gaps.*

Given the status achieved to date and the remaining steps for review and detailed elaboration of plans before licenses are issued, the project is on track to deliver a comprehensive set of assessment studies and management plans. No non-compliances with provisions under the approvals process have been registered so far by the Partnership or provincial regulators.

A number of residual negative impacts are expected to remain after mitigation. These include social effects from worker interaction, losses of caribou habitat, changes to water quality, and mercury levels in fish, and are all deemed to be acceptable given their temporary or spatially limited nature, the compensation programmes that will be put in place, and the overall benefits of the project.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, environmental and social plans avoid, minimise, mitigate and compensate negative project impacts with no identified gaps; and plans provide for enhancements to pre-project environmental or social conditions or contribute to addressing issues beyond those impacts caused by the project.*

In addition to the comprehensive attention to negative impacts, the project addresses a number of legacy issues from past hydropower developments and contributes to socio-economic development of directly affected communities. It provides a unique opportunity for the KCN both for short-term employment and business opportunities and for long-term economic independence. The project also intends to address one key environmental concern by improving the status of Lake Sturgeon in the river reach affected by the project, as well as up- and downstream on the Nelson River.

Criteria met: Yes

## 5.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 5.3 Scoring Summary

The project has followed Canadian and international best practices in assessing, avoiding, mitigating and compensating its environmental and social impacts. All of MH's environmental and social issues management is certified against the ISO 14001 standard.

The quality of the outcomes has been supported by close and long-running interaction with knowledgeable and experienced communities, the general public and regulatory authorities. The comprehensive involvement of directly-affected communities has resulted in those communities becoming project partners and co-proponents. There are no significant gaps against proven best practice, resulting in a score of 5.

**Topic Score: 5**

## 5.4 Relevant Evidence

<b>Interview:</b>	1, 2, 3, 4, 5, 12, 14, 31, 40, 43, 46, 51, 52, 55, 58, 59, 61, 65
<b>Document:</b>	1, 2, 3, 4, 30, 42, 55, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 73, 85, 86, 89, 132, 133, 158, 167, 177, 181
<b>Photo:</b>	None

## 6 Integrated Project Management (P-6)

This topic addresses the developer's capacity to coordinate and manage all project components, taking into account project construction and future operation activities at all project-affected areas. The intent is that the project meets milestones across all components, delays in any component can be managed, and one component does not progress at the expense of another.

### 6.1 Background Information

As described in the introductory sections, Keeyask is managed, and will be licensed and constructed as three projects: the Keeyask Generation Project (KGP), the Keeyask Infrastructure Project (KIP) and the Keeyask Transmission Project (KTP).

Manitoba Hydro (MH) is managing the licensing and construction of Keeyask on behalf of KHLF. The units within MH that are responsible for Keeyask include: a Pre-Construction Project Team, comprised of staff from the divisions of Power Projects Development and Portfolio Projects Management; Transmission Planning and Design Division (TPD); and the New Generation Construction Division (NGC).

A total of forty-five contracts are expected to be required to construct the project, including engineering, supporting infrastructure, civil works, electrical, mechanical, and services contracts. KGP and KTP are not yet licensed and it is too early to have appointed contractors, though pre-qualification is now underway. Construction of the northern access road under KIP is now underway, through a joint venture between Sigfusson Northern and Tataskweyak Cree Nation (TCN).

Keeyask has a relatively complex sequence of construction, with cofferdams on three channels of the river. Key milestones and interface issues for Keeyask are: the interface between the Pre-Construction Project Team, TPD and NGC; completion of the northern access road to allow construction to begin in summer 2014; the installation of the construction power station to allow heavy construction to begin, in summer 2015; the construction of the powerhouse coffer dam by December 2014 to allow excavation for the powerhouse to commence in 2015; the placing of concrete at the powerhouse and spillway in 2016; and the completion of the south dam (completing the dam across the full length of the river) in 2019. A total of 9 coffer dams, 2 groins, and 1 ice boom are required for construction. Construction of KGP is planned for June 2014, with the first generator coming online in December 2019. Note that KIP was approved in March 2011 and construction began in January 2012. KTP will be fully owned and operated by MH. A total of 8.4 million m<sup>3</sup> of rock and other construction materials will be used for construction, and 4.1 million m<sup>3</sup> of construction waste will be generated.

The management of the partnership between KCN and MH is a significant activity of overall project management. The plans and processes described under this topic concern the delivery of the project, whilst processes for the management of the partnership are addressed under P-2.

### 6.2 Detailed Topic Evaluation

#### 6.2.1 Management

##### Analysis against basic good practice

**Scoring statement:** *An integrated project management plan and processes have been developed that takes into account all project components and activities with no significant gaps; and a construction management plan has been developed that identifies construction risks and describes processes that contractors and others are required to follow to manage these risks.*

MH employs a range of processes for the integrated management of Keeyask, and has developed an integrated plan in the form of the Keeyask Project Implementation Plan (KPIP).

The KPIP is, so far, available in draft form, dated October 2010. It provides information on “means, methods, tools and techniques” to be used for management of the project, and sets out “who is doing what”. The plan is to finalise it in 2013. It includes descriptions of the JKDA, AEAs, licensing, an integrated control plan, schedule-management and other relevant integrated project-management items.

Under “Scope Management” it describes work-breakdown structures (WBS). Each WBS is given a P number in MH’s SAP-based project and financial management system. Work packages within the WBS are identified by a unique 6 digit number, and work packages set out tasks to which staff charge their time. Under “Schedule Management”, the plan describes processes and activities for developing the schedule, monitoring and controlling the schedule and roles and responsibilities, linked to contract dates and interface dates. A section on Risk Management describes the appointment of a Risk Management Engineer to facilitate risk identification.

MH uses a range of processes, most of which are held in their easily accessible Sharepoint system. Processes include: a “Project Charter”; project schedules (with activity, department, responsibility, physical % complete, and start and end dates); budgeting and cost control in SAP; risk identification in Sharepoint; monthly reports to the senior-management team including top 3 risks; change-management request forms used to identify, manage and approve changes to schedule; and contractor management. These are used by all project teams, the Pre-Construction Project Team, TPD and NGC. For example, the Project Charter for Keeyask’s Pre-construction activities, revised November 2012, includes the project scope, responsibilities, end products, key interim deliverables, budget, and team endorsements (i.e. signatures). Change request forms enable a team member to escalate a request a change to the scope, tasks or budget, with the Pre-construction Project Manager using the form to escalate requests to the Advisory Group of division managers. The Advisory Group meets quarterly to advise the Pre-Construction Project Team.

NGC’s Project Services Department provides a library of approximately 100 policies and procedures, including costing and scheduling procedures. A Summary Schedule for the construction of the KGP lists e.g. activity, activity type, and start and finish dates.

TPD have developed a Project Charter (specific to the KTP), a schedule and scope of works for the construction power station and construction power transmission line, and a project management plan for KTP.. These are all held on the Keeyask Construction Power Sharepoint site. It is too early to have developed a charter etc. for the permanent transmission line.

Detailed Construction Environmental Protection Plans (EPPs) have been developed for all components. These include EPPs for the Generation Station (at this stage in draft), KIP, KTP, and South Access Road (draft), and the Instream Construction Sediment Management Plan (see P-20). These plans comprehensively identify risks and the specific measures required of contractors to manage these risks. A general EPP is normally prepared for licensing purposes, followed by specific EPPs for each contractor or construction site.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the integrated project management plan sets out measures to manage interface and delay issues without impinging on overall project timetables and budgets; construction management plans ensure that land disturbance and waste generation activities will be managed so that later rehabilitation activities can be undertaken efficiently and effectively; and processes are in place to anticipate and respond to emerging risks and opportunities.*

Processes in place to manage interface and delay issues concern both the interface between MH departments, as well as the interface with and between contractors on site. The Pre-construction Project Team is held responsible, via their Project Charter, for the delivery of licenses and the project’s technical memorandum to NGC. The Project Charter includes a requirement for construction integration, i.e. that an NGC engineer participates in the team, providing co-ordination with NGC. An NGC project engineer has been involved in

project preparation in this way for 5 years. In addition, TPD previously attended Pre-construction Project Team meetings, and now has bi-weekly meetings with NGC's Project Engineer.

Interfaces with and between contractors are managed by consideration of the best contracting vehicle, contract stipulations, interface activities identified in schedules, and day-to-day coordination on-site. A "Project Delivery Strategy" paper prepared by NGC in 2012 sets out contracting options (Design Bid Build, versus Integrated Project delivery etc.) for Keeyask and other major construction projects. As an example of practical use of interface management tools, the KIP north access road construction site employs daily morning meetings between contractors and the MH site supervisor.

The Construction EPPs described above include regulatory requirements, roles and responsibilities, contractor-developed emergency response and waste management plans, scheduling restrictions and detailed environmental protection measures. The EPPs also comprehensively identify the measures required to manage land disturbance and waste to enable efficient rehabilitation. The EIS includes a commitment to provide a Vegetation Rehabilitation Plan to regulators during construction, setting out measures to restore priority habitat types, using a go-with-nature approach referred to in the JKDA. Rehabilitation is planned to be completed by 2022.

Each of the Pre-construction Project Team, NGC and TPD use processes to anticipate and respond to emerging risks. The Pre-construction Project Team has developed a Pre-construction risk register and risk registry tables for the preparation of KGP and KIP. NGC is developing a risk register for cost risks, and NGC's Risk Engineer is responsible for its completion and updating. NGC also have a Keeyask 'estimate sensitivity model' identifying cost risks. A register of risks for KIP is held on Sharepoint, and presently there are only low- and medium-impact risks. Previous experience with the Wuskwatim project, where delays in delivery of a directly-negotiated contract required the appointment of an additional contractor, indicates that risks will be identified and managed effectively.

Criteria met: Yes

## 6.2.2 Outcomes

### Analysis against basic good practice

**Scoring statement:** *The project is likely to meet overall budget and timing objectives and targets, and plans avoid, minimise and mitigate construction risks with no significant gaps.*

The most significant risks affecting the project budget and schedule are the licensing of KGP and continuation of the KHLP with ongoing support amongst KCN Chiefs, Councils and members. During pre-construction, delays may result from the NFAT process and public hearings, or the Bipole III hearings. For all stages and components, the availability of internal staff resources and contractors is a risk. However, it is clear that, through the management processes described above, the project is likely to meet overall budget and timing objectives and targets. In addition, the details of the Construction EPPs indicate that construction risks will be avoided, minimised and mitigated with no significant gaps.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the project is highly likely to meet overall budget and timing objectives and targets; and plans avoid, minimise, mitigate and compensate construction risks with no identified gaps.*

The strategic direction of the preparation of Keeyask is highly focused on the risks affecting project licensing and the support for the partnership amongst KCN members. Approaches to reduce these risks include the signed agreements of the JKDA and AEAs, and a significant effort to generate employment through directly-negotiated contracts (DNCs). A discussion paper has been developed and discussed with each KCN partner to more clearly define their roles and responsibilities in the regulatory process, and a KCN Pre-Hearing



Coordination Group has been established with representatives from MH and the lead witnesses for each of the KCN. Keeyask is able to draw upon the previous experience of the Wuskwatim project, which takes a very similar partnership approach, also in northern Manitoba. Overall the project is highly likely to meet overall budget and timing objectives. In addition, residual risks – i.e. those remaining after the avoidance, minimisation and mitigation of construction risks – will not be significant and will not require compensation. Note that the EIS for the KIP includes a commitment that the north access road will be decommissioned and the site returned to the pre-construction conditions as far as practical, in the event that the KGP is not licensed.

Criteria met: Yes

### 6.2.3 Evaluation of Significant Gaps

#### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

#### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

### 6.3 Scoring Summary

MH uses, on behalf of KHLP, a comprehensive range of approaches and tools for integrated project management, which concern both project preparation and implementation, and address all project components. In addition a number of risk identification and management processes are used, also for all components. Detailed Construction Environmental Protection Plans (EPPs) have been developed for all components, which are highly likely to avoid, manage and mitigate construction risks, with no significant residual impacts. Keeyask is highly likely to meet milestones across all components, manage delays in any component, and manage interfaces to avoid any component progressing at the expense of another.

There are no significant gaps at the level of proven best practice, resulting in a score of 5.

Topic Score: 5

### 6.4 Relevant Evidence

<b>Interview:</b>	10, 34, 47, 52, 53, 63, 68
<b>Document:</b>	22, 23, 25, 28, 43, 44, 49, 53, 54, 56, 70, 75, 78, 81, 86, 142, 145, 151, 152, 154, 156, 168, 192
<b>Photo:</b>	None

## 7 Hydrological Resource (P-7)

This topic addresses the level of understanding of the hydrological resource availability and reliability to the project, and the planning for generation operations based on these available water inflows. The intent is that the project's planned power generation takes into account a good understanding of the hydrological resource availability and reliability in the short- and long-term, taking into account other needs, issues or requirements for the inflows and outflows as well as likely future trends (including climate change) that could affect the project.

### 7.1 Background Information

The Nelson River is the fourth longest river in Canada, with a catchment that extends across the Canadian Provinces of Alberta, Saskatchewan, Manitoba and Ontario, and the US states of Montana, North Dakota and Minnesota. The Winnipeg, Red and Saskatchewan basins feed the catchment. Lake Winnipeg is the Nelson's primary tributary and acts as a reservoir for the hydroelectric projects on the river, controlled by the Lake Winnipeg Regulation (LWR). The Churchill River through the Churchill River diversion (CRD), also contributes to the flow in the Nelson, using a series of channels and control structures to divert flow from the Churchill river through the Burntwood River to meet the Nelson at Split Lake. The existing flow at the Keeyask site fluctuates between 2 000 and 4 700 m<sup>3</sup>/s through the year with an average of app. 3 050 m<sup>3</sup>/s. The river flows into the sea (Hudson Bay) at York Factory in north-eastern Manitoba.

The demand for electricity in Manitoba is highest in the winter, whilst the natural water resource availability is highest in the summer. This challenge is negotiated by using reservoirs, particularly Lake Winnipeg, to match river flow with electricity demand. As such, the patterns of flows and elevations on the Nelson River are strongly influenced by MH operations.

There are five existing hydropower plants on the Nelson River, see map in the Project Description. Upstream of the proposed Keeyask development, the Jenpeg GS is located just downstream of the outlet of Lake Winnipeg and the Kelsey GS is located above Split Lake. There are three plants located downstream of Keeyask: Kettle, Long Spruce and Limestone. MH is also currently planning for a future hydropower development at Conawapa, 90 km downstream of Gillam.

The aspects most relevant to the assessment and management of hydrological resource will be addressed here while the inter-related issues of the hydrological resource's importance for strategic fit and design are dealt with under P-3 and P-4 respectively.

### 7.2 Detailed Topic Evaluation

#### 7.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *An assessment of hydrological resource availability has been undertaken utilising available data, field measurements, appropriate statistical indicators, and a hydrological model; issues which may impact on water availability or reliability have been identified and factored into the modelling; and scenarios, uncertainties and risks have been evaluated.*

Assessment of the region's hydrology utilises numerous data sources. There are over 35 years of detailed flow monitoring on the Nelson River. Data from the time prior to the implementation of the LWR and the CRD are also available for various locations, e.g. Lake Winnipeg outflow records start as early as 1912. There is a hydrometric monitoring network giving hourly flows and water-level data, covering all the major rivers feeding into the Nelson. Other sources of data include: automatic water-level gauge data from five locations in the

project area between 2001 and 2009; discharge and water-level data from Kettle generating station from 1977-ongoing; water velocity profiles from 36 locations along the river taken in 2003; Water Survey of Canada hydrometric data; and metrological data from Gillam airport.

The assessment of hydrological resource availability is comprehensive. MH has undertaken flow-duration analysis for the project site using all available data, including open-water daily flows and winter daily flows.

MH has developed one, two and three dimensional numerical hydraulic models to assess open-water conditions and winter conditions. The open-water numerical models were calibrated to within 0.1-0.2 metres of measured data/rating curves.

The assessment has factored in a number of issues that may affect water availability or reliability, including changes in land use as well as abstraction and variation in operating regimes. This analysis predicts stable water-resource availability based on the facts that: the Churchill and Nelson River basins are sparsely populated and significant land use change is not predicted; and the Province of Saskatchewan has undertaken long-term water studies, which show a slight increase in abstraction in the future.

MH has built this finding into the planning models and it results in only a minor impact on power generation scenarios; Upstream regulation can affect flows into Lake Winnipeg, but the lake has such high capacity that this does not appreciably affect outflow to the Nelson River system; The 1969 “Master Agreement on Apportionment and By-Laws, Rules and Procedures” governs the volume of water flowing into Manitoba from Saskatchewan and Alberta, this agreement provides an apportionment formula for eastward flowing interprovincial streams; The Boundary Waters Treaty governs control of waters along the international border, and provides rights and legal remedies to Canada for damages resulting from diversions of waters that would otherwise have flowed across the border into Canada.

MH has modelled a large number of scenarios, risks and uncertainties using the SPASH model (Simulation Program for Long-term Analysis of System Hydraulics). The flow rate of the Nelson River is naturally cyclical and MH consider the existing 30-year flow record since the LWR and the CRD as too short to extrapolate future flows, so a 94-year simulated flow record has been developed for planning purposes based on measured data. This simulated flow series for long-term inflows takes into account unregulated tributaries on the Nelson and Burntwood rivers, hydrological operating regulations, installed generation capacity and transmission components and future projected demand for power.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, issues that may impact on water availability or reliability have been comprehensively identified; and uncertainties and risks including climate change have been extensively evaluated over the short- and long-term.*

MH has comprehensively identified issues that may affect water-resource availability and reliability, as outlined in the analysis against basic good practice above. This work highlights climate change as the major area of risk and uncertainty for the hydrological resource. MH has produced a Climate Change Impact Studies Strategy to outline its approach to assessing climate-change impact on the Nelson-Churchill river catchment through long-duration studies. This strategy document has been peer-reviewed, and the outputs of the research to be undertaken will be peer-reviewed.

MH has modelled future climate scenarios for the immediate project area and is presently continuing with work for the full Nelson River catchment, following World Meteorological Organisation and IPCC guidance. This work examines the impact on water flow, temperature, and ice formation and breakup. The models created will run 139 different scenarios to assess likely future impact of climate change on generating capacity. The model construction, calibration and validation process is ongoing and is expected to be complete for all river basins in 2015. MH is collaborating with other Provinces to share the study’s findings, and takes part in an

‘energy working group’ with various Canadian utilities, coordinated by the Federal government. In the future, MH plans to build climate-change driven variation in land cover and vegetation into simulations to assess the resulting impact on the hydrological resource.

The work to understand the impact of climate change on the Nelson River flows is ongoing, and conclusions are not available at this time. As such, the findings of the study will not be able to feed into the design of the Keeyask project, which is considered a **significant gap** at the level of proven best practice.

Criteria met: No

## 7.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *A plan and processes for generation operations have been developed to ensure efficiency of water use, based on analysis of the hydrological resource availability, a range of technical considerations, an understanding of power system opportunities and constraints, and social, environmental and economic considerations including downstream flow regimes.*

There is no generation operations plan for the Keeyask project in isolation. MH operates all generating stations as an integrated system to maximise return on the available water resource. The power system is modelled including parameters like hydrological resource, fuel price, wind generation, water rentals, export contracts and the incremental cost of electricity. MH then uses the output of this model to generate a weekly operating plan for the system, which schedules reservoir releases to maximise profit.

MH will operate the Keeyask project as a “modified peaking plant”, i.e. either peaking mode or base load depending on the flows in the Nelson River and the requirements of the integrated power system. The Keeyask reservoir has limited storage and MH will operate the reservoir within its one-metre operating range at any time.

Operations are constrained by the need to comply with the Water Power Act that governs the use of water resources in the Province. MH must also operate the entire hydraulic system within the constraints of each station’s licence, the most significant of which are those that govern the operation of the Lake Winnipeg Regulation (LWR) and the Churchill River Diversion (CRD), which in turn determine the seasonal flow pattern in the Nelson River.

A range of technical considerations has been included in operations planning. For example, special operating conditions may be used if there is load rejection, flood management requirements, or adverse meteorological events.

Significant consideration of social and environmental issues in the project design phase has reduced the need for complex operating plans. By choosing a low-head design with a small operating range, the project avoids the need for a reservoir operating management strategy to address environmental or social issues. Part of the Adverse Effects Agreements (AEAs) sets out pre-determined compensation to the KCN if the operating range is breached. However, breach is not expected and MH will monitor conformance with the licence requirements on a daily basis. Examples of how operations plans are based on environmental considerations are: operation will ensure sufficient water velocities in the lake sturgeon spawning area (downstream of the powerhouse) during the spring spawning period; and operation may also be constrained if monitoring shows lake sturgeon eggs are deposited downstream of the spillway, which may necessitate its continued operation until the eggs have hatched even if spilling is no longer required for operational purposes.

Keeyask will have negligible effect on the water level in Stephens Lake in peaking or base-load mode of operation. The tail-water level will be a function of the level of Stephens Lake (controlled by the Kettle dam), rather than a function of the discharge from the powerhouse. Downstream flows are comprehensively addressed in topic P23.

### Analysis against proven best practice

**Scoring statement:** *In addition, generation operations planning has a long-term perspective; takes into consideration multiple uses and integrated water resource management; fully optimises and maximises efficiency of water use; and has the flexibility to adapt to anticipate and adapt to future changes.*

The generation planning at Manitoba Hydro has a 35-year time horizon, accounting for load growth and changes in the water resource. The planning process is repeated annually with revised inputs. Regarding multiple uses, flood mitigation is built into the operating regime to the extent that it can be forecasted. Flooding largely comes from snowmelt and MH will manage flood risk by running the station at maximum discharge when required. In addition, operation planning considers multiple uses and integrated management of the water resource by addressing the requirements of the KCN, other First Nations as well as other local users.

The operating prioritises is the optimisation and maximisation of water-use efficiency. The key factors are as follows: energy supply, energy reserves, reliability, citizenship concerns (including environmental concerns) and economic operation. Project design underwent multiple iterations to reduce environmental impact, flooding and disruption by ice (see P-4), removing the need for complex operating rules. The operating levels came about through consultation with the KCN and have been finalised using an iterative and consultative process. The reservoir level and operating plan achieves a balance, minimising environmental and social impact whilst maintaining economic and technical viability.

The SPLASH model and ongoing assessment of water-resource availability feeds into the operations planning on a continuous basis, allowing it to adapt to future changes in water supply and energy demand in the long and short term.

## 7.2.3 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

Assessment of the impact of climate change on the Nelson River flow will not be complete before the Keeyask design is finalised.

1 significant gap

## 7.3 Scoring Summary

A thorough assessment of hydrological resource has been undertaken, including issues that affect water availability and reliability. MH has multiple and extensive sources of data to draw upon, allowing the simulation of a 94-year flow record. Using the SPLASH model, MH have comprehensively identified and modelled scenarios, uncertainties and risks. The most significant risk and uncertainty identified by the project is climate change and there is an ongoing, detailed study into the potential impacts on water availability. A plan and processes for generation operations exists as part of MH's integrated power system. This accounts for hydrological-resource availability, technical considerations, power-system opportunities and sustainability considerations. Planning has a long-term perspective, over 35 years, considers the KCN, aquatic habitats, and serves to optimise the efficiency of water use. There is one significant gap against proven best practice, that

the study into the impact of climate change on the Nelson River catchment has not yet been finalised, resulting in a score of 4.

**Topic Score: 4**

## 7.4 Relevant Evidence

<b>Interview:</b>	1, 8, 16, 25, 32, 36, 42
<b>Document:</b>	7, 16, 17, 57, 62, 91, 107, 135, 137, 160, 165
<b>Photo:</b>	None

## 8 Infrastructure Safety (P-8)

This topic addresses planning for dam and other infrastructure safety during project preparation, implementation and operation. The intent is that life, property and the environment are protected from the consequences of dam failure and other infrastructure safety risks.

### 8.1 Background Information

Infrastructure safety has focussed on protecting life, property and the environment from the consequences of a dam breach, as well as the design and implementation of public-safety measures on land and water related to the construction and operation of the Keeyask Generation Project (KGP) and its permanent supporting infrastructure. This includes access roads (The north access road is being implemented under the ongoing Keeyask Infrastructure Project (KIP)) and the Keeyask Transmission Project (KTP).

With the exception of international waterways and canals, dam safety is a provincial issue in Canada. In contrast to other major hydropower provinces in Canada, such as British Columbia, Ontario and Quebec, there is no specific dam-safety regulator in Manitoba. The region is characterised by very low seismicity.

Manitoba Hydro (MH) conducts a dam-safety programme, administered by the Dam Safety Section of the Engineering Services Division that ensures its dams (approximately 200 in number, of which 40 are less than 2.5 m in height) are constructed, operated and maintained in a safe manner. This programme is based on the "Dam Safety Guidelines" of the Canadian Dam Association (CDA). Criteria other than those listed in these Guidelines may be used if they are in general agreement with the intent of the Dam Safety Guidelines. Some of the key elements of MH's dam-safety programme include: the various station Emergency Preparedness Plans (EmePPs), Operations, Maintenance and Surveillance Manuals (OMS), Dam Safety Reviews (DSR) and Dam Safety Annual reports.

### 8.2 Detailed Topic Evaluation

#### 8.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment has been undertaken of dam and other infrastructure safety risks with appropriate expertise during project preparation, construction and operation, with no significant gaps.*

MH has undertaken a thorough professional review of the dam and other infrastructure safety risks (on land and water) for project preparation, construction and operation with no significant gaps. The design flood which the project (powerhouse and spillway) must be capable of passing, was based on the CDA Guidelines. Using the CDA's criteria, MH has characterised the KGP in the "extreme" consequence category. This is because of the extreme economic and potential social and environmental impacts that could occur in the case of a dam failure during an extreme flood event at Keeyask, since such an event would also negatively affect the downstream dams (Kettle, Long Spruce and Limestone) as well as the community of Gillam (with a population of 1 200 according to the 2006 census).

During the first half of 2013, MH employed a four-person independent Panel of Experts to conduct a dam-safety review of the KGP and benchmark it against the CDA Guidelines. The panellists' expertise covers such areas as dam-safety management systems, geotechnical, hydro-technical and structural engineering, emergency-preparedness planning, public safety and operations, and they have been closely involved in the development of the CDA Guidelines.

Criteria met: Yes



## Analysis against proven best practice

**Scoring statement:** *In addition, the assessment includes consideration of a broad range of scenarios, and includes both risks and opportunities.*

The Panel of Experts has confirmed that, in accordance with the CDA Guidelines, infrastructure safety includes consideration of a broad range of scenarios, from multiple perspectives (including hydro-technical, seismic, geotechnical, structural, mechanical and electrical). Assessment of failure modes concerning natural and operational events has been fed into the design criteria. In relation to public water safety around dams, MH has developed a comprehensive assessment and treatment of risk, the results of which will be integrated into a plan, encompassing the project construction and operation stages.

In relation to opportunities, from the beginning of discussions on the KGP between KCN and MH, KCN communities identified the need to address public safety issues on the Nelson river under both summer and winter conditions.

Criteria met: Yes

## 8.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Dam and other infrastructure safety management plans and processes have been developed for project implementation and operation in conjunction with relevant regulatory and local authorities with no significant gaps and provide for communication of public safety measures; emergency response plans include awareness and training programs and emergency response simulations; and dam safety is independently reviewed.*

MH has developed dam and other infrastructure-safety management plans and processes to be implemented during project implementation and operation. The following steps are being taken or are planned to minimise land and water safety and other risks during project construction and operation: during construction, boat and snowmobile users of the Nelson river will be restricted from travelling close to the main construction site; overall safety for water- and ice-based travel upstream and downstream of the KHP, will be based on the Waterways Management Program as well as waterways public-safety measures; a Reservoir Clearing Plan has been developed to minimise potential for debris in the reservoir following impoundment (See also P-22); in a joint venture between Manitoba Hydro and Manitoba Infrastructure and Transportation, the Provincial Road 280 will be upgraded to improve safety and accommodate increased traffic; and during construction an Access Management Plan will control access to the new north and south access roads with security gates. The access roads will be private during the construction stage.

Safety of the Keeyask dam will be managed in the context of the Manitoba Hydro dam-safety programme (see above). In addition to addressing design and construction parameters, mentioned above, the KGP dam-safety programme will include: ongoing condition assessments of structures, which include inspection, instrumentation and analysis to detect potential problems as early as possible; an EmePP prepared for the extremely unlikely event of dam failure; periodic safety reviews undertaken by an external engineer; and regular reporting/documentation.

The EmePP will include information for emergency responders and local civil authorities on items such as MH's emergency-response procedures; emergency-classification structure; notification protocols; and potential inundation due to an extreme flood or a dam break. In accordance with the CDA Guidelines, the emergency processes will ensure adequate staff training, plan testing (including emergency-scenario simulations) and plan updating. MH will distribute copies of the EmePP as well as offer presentations to local emergency-response agencies and local civil authorities prior to the impoundment of the reservoir. Some of these safety-management plans are already being implemented in the ongoing KIP.

MH plans to complete the initial versions of the EmePP, the Dam Safety Reference Manual, the Waterways Management Program as well as waterways public-safety measures during the ongoing Stage V (Final Design) studies.

The independent Dam-Safety Review mentioned above concluded that the design process and MH's dam and public-safety programmes, which will support ongoing operations at Keeyask, substantively meet the 2007 CDA Dam Safety Guidelines and the 2011 CDA Guidelines for Public Safety Around Dams. In fact the Panel evaluated the Keeyask project against 229 requirements of the CDA Guidelines and found that 93% were either currently meeting the CDA Guidelines (94 requirements), or there was sufficient evidence to demonstrate that if work was completed along the lines of examples (of other projects) provided to the panel, the project would meet CDA Guidelines (118 requirements). It is advisable to continue the independent review of dam safety by iteratively engaging the independent review panel to confirm that Keeyask ultimately meets these 118 requirements, and the remaining 17 requirements, as recommended. The absence of an ongoing process of independent dam-safety review, to review these 135 requirements for Keeyask itself is a gap. However, it is not significant at this stage, as the review has been completed as far as possible at this stage.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities; plans provide for public safety measures to be widely communicated in a timely and accessible manner; and emergency response plans are independently reviewed.*

The plans described above, specifically the dam safety programme and EmePP, will be used to respond to emerging risks in relation to the implementation and operation of the KGP. The EmePP can be expected, on the basis of the equivalent existing Kettle EmePP, to provide for public-safety measures to be widely communicated in a timely and accessible manner. Processes to respond to emerging opportunities include ongoing in-depth dialogue with KCN communities and the involvement of community members in the waterways safety programme.

MH plans to conduct a third-party review of the EmePP, as part of their routine third-party operational safety-management reviews. MH has confirmed that this would be 'within 5 years' of the KGP commissioning (according to the KGP EIS, all generators are scheduled to be in service by 2020). However, there are no plans to conduct a third party independent review of the EmePP during project preparation. The independent dam safety review investigated 26 requirements of the CDA guidelines concerning emergency preparedness, and just 4 are met or substantially met (those concerning updating of emergency plans, and training of personnel). The panel concluded that the remaining 22 requirements would be met if Keeyask's emergency planning followed that of the Kettle station. The absence of plans to fully independently review Keeyask's EmePP prior to the end of preparation, especially in view of Keeyask position in a cascade of plants, is a **significant gap**. This gap would be addressed by an iterative engagement of the independent review panel noted under basic good practice above, as practised in other Canadian provinces. .

Criteria met: No

## 8.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans avoid, minimise and mitigate safety risks with no significant gaps.*

As confirmed by an independent dam-safety review, MH is developing comprehensive plans to address infrastructure safety during the construction and operation of the KGP and its appurtenant infrastructure in accordance with the guidelines of the Canadian Dam Association. These plans will avoid, minimise and mitigate

safety risks, as appropriate, with no significant gaps. Similar to MH's other generating stations, there will be periodic dam-safety reviews during the operating phase of Keeyask.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans contribute to addressing safety issues beyond those risks caused by the project itself.*

KHLP's approach to the development and implementation of the KGP includes addressing public-safety issues beyond those caused by the project itself. In response to KCN communities' early requests, the KGP will encompass a Waterways Management Program (including patrolling the reservoir and the Nelson river downstream of the dam and removing debris etc) which will improve public safety in comparison to the current situation, especially in combination with the portage facilities to be constructed at the dam, which will provide for safe passage in contrast to the hazardous passing at Gull rapids under present conditions. In addition, the north and south access roads are being built in accordance with provincial standards, and once the Keeyask Project is completed will be integrated into the provincial highway network, which is estimated to lead to a reduction in travel time between Thompson and Gillam of approximately 45 minutes and thereby contribute to a reduction in road accidents.

Criteria met: Yes

## 8.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

During the preparation of the KGP, there are no plans to independently review emergency response plans.

1 significant gap

## 8.3 Scoring Summary

Manitoba Hydro has undertaken a thorough professional assessment of the dam and other infrastructure safety risks (on land and water) for project preparation, construction and operation with no significant gaps, based on CDA's Dam Safety Guidelines. Manitoba Hydro is developing dam and other infrastructure safety-management plans and processes to be implemented during project implementation and operation. These provide for the development of an Emergency Preparedness Plan and awareness programmes. Some of these safety management plans are already being implemented in the ongoing Keeyask Infrastructure Project.

In the first semester of 2013, Manitoba Hydro commissioned an independent panel safety review of the KGP which concluded that the design process and Manitoba Hydro's dam and public safety programmes which will support ongoing operations at Keeyask substantively meet the 2007 CDA Dam Safety Guidelines and the 2011 CDA Guidelines for Public Safety Around Dams. However, there are no plans to independently review the project's emergency response plan during the preparation stage, and the planned third-party review could be as late as five years following commissioning.

In the context of addressing safety issues beyond those caused by the project itself, the new Waterways Management Program will address public-safety risks over and above those caused by the project itself.

There is one significant gap at the level of proven best practice, resulting in a score of 4.

## 8.4 Relevant Evidence

<b>Interview:</b>	18, 41, 71, 72, 73
<b>Document:</b>	57, 63, 70, 74, 96, 153, 211, 212
<b>Photo:</b>	None

## 9 Financial Viability (P-9)

This topic addresses both access to finance, and the ability of a project to generate the required financial returns to meet project funding requirements, including funding of measures aimed at ensuring project sustainability. The intent is that projects proceed with a sound financial basis that covers all project funding requirements including social and environmental measures, financing for resettlement and livelihood enhancement, delivery of project benefits, and commitments to shareholders/investors.

### 9.1 Background Information

The Keeyask project is a major financial commitment with an estimated in-service cost (year 2019) of Canadian dollar (CAD) 5.6 billion. This includes base costs for the infrastructure component of CAD 218 million, the generating component of CAD 3 094 million, and the transmission component of CAD 114 million, as well as contingencies, interest during construction and cost escalation. Costs per installed MW are high in comparison with past projects and international benchmarks. This is due to the site arrangement and the costs of construction in northern Canada, as well as quality expectations by MH and the substantial expenditures on social and environmental mitigation, including compensation payments to, directly-negotiated contracts (DNC) with, and anticipated support for equity positions taken by, the KCN. High investment costs are partly compensated by the high load factor so that costs per kWh generated are among the lowest-cost options available to MH.

MH's share of the project of at least 75% will be borrowed (as for all other major MH investments) at low cost from the province or with provincial guarantees. The KCN can choose to acquire a share of up to 25% of the project, using existing resources such as trust funds or borrowing from MH.

The project will sell power to MH which will market it to customers in the province and in export markets, either through long-term power-sales agreements that have already been concluded for 350 MW (conditional upon approval of the project) and are being negotiated for more, or in short-term markets.

The project is part of an overall capital expenditure plan of MH, which also includes the Bipole III HVDC line which is required to bring power to the load centres in southern Manitoba, and the cross-border transmission lines which are required to sell part of the power to customers in the Mid-West power pool. In line with anticipated demand increases in the province and export opportunities, over the next decade MH will undertake several major capital projects in parallel, including Bipole III (CAD 3.3 billion) and Conawapa hydropower generating station (CAD 7.8 billion). Borrowing for these projects will push the equity/debt ratio below the target ratio of 25/75. It will drop to 12/88 by 2021 before recovering to 25/75 by 2030. The interest coverage ratio will remain below the target of 1.2 until 2024. These ratios were even lower during previous expansion programmes in the 1980s, but have recovered since.

Investment projects identified by business units (in the case of generation, through the Power Resource Options process) are subjected to an internal Capital Project Justification process before they become part of the MH budget and 20-year Integrated Financial Forecast, on which basis borrowing requirements are defined and submitted to the province.

## 9.2 Detailed Topic Evaluation

### 9.2.1 Assessment

#### Analysis against basic good practice

**Scoring statement:** *An assessment of corporate financial viability, including potential project costs and likely revenue streams, has been undertaken using recognised models with no significant gaps; analyses include risk assessment, scenario testing and sensitivity analyses.*

MH does not face retail competition in Manitoba and has regulated rates which allow for cost recovery, and therefore predictable earnings from its home market. Export revenues are more volatile and have declined recently, partly due to the economic crisis in the USA as well as lower natural-gas prices, resulting in lower electricity prices. However, under most scenarios wholesale export prices are expected to recover, and much of the export revenue comes from long-term fixed-price sales agreements and is therefore also predictable. Revenue is generally not calculated per project but for the entire generation fleet; however in the case of the Keeyask project, owned by a separate entity in which MH is one among several partners, specific revenue forecasts can be based on the Power Purchase Agreement in combination with MH's general sales forecasts.

On the cost side, MH has decades of experience in estimating and managing project costs. Nevertheless, cost and schedule overruns do occur as in the recent Wuskwatim project. The costs of the Keeyask project are regularly updated as major steps in project preparation are concluded, or as new information on cost risks comes in (for example, when contracts are concluded), and a cost-estimate sensitivity model is maintained.

Financial returns for the KCN include guaranteed annual payments under the Adverse Effects Agreements, and if they chose to invest in the project, probably some guaranteed minimum revenues and protections for the principal invested (resulting in a higher internal rate of return for the KCN than for MH). Potential revenues include expected returns from investing in the project and from business ventures that have DNCs with MH. Similar arrangements have been negotiated in the previous project partnership between MH and another Cree Nation, for the Wuskwatim project.

Criteria met: Yes

#### Analysis against proven best practice

**Scoring statement:** *In addition, project costs and revenue streams are fully detailed; and financial viability of the project has been analysed and optimised including extensive scenario testing, risk assessment, and sensitivity analyses.*

The project costs are as fully detailed as can be expected at this point in project preparation; once final design is concluded, another update will be prepared. Revenue forecasts for domestic and export sales are regularly updated, and information for cost and revenue forecasts includes a range of sources, including macro-economic scenarios for Canada and the USA.

A number of provincial-level bodies, ratings agencies and reputable consultants have reviewed and are reviewing MH's financial assessments, including the probabilities of different scenarios, assumptions in financial models and the risks of long-term export-sales agreements. Impacts of changes in major parameters on MH's financial situation and on rates are annually updated and published in the Integrated Financial Forecast. A major review of the commercial justification of the project including its sensitivity to changes in assumptions is upcoming (NFAT).

Criteria met: Yes

## 9.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Financial management plans and processes have been developed for project implementation and operation with no significant gaps, and opportunities for project financing have been evaluated and pursued.*

MH has well-established and comprehensive business practices for the financial management of major capital projects, which it will use as the project manager and future operator for the Keeyask Partnership. This includes a project cost management plan and a risk register including the financial implications of all major risks.

Project delivery and procurement practices are supportive of good financial management. For example, procurement for turbines and generators was based on a design&build contract (advanced in order for powerhouse design to be able to accommodate final turbine and generator layout), bid evaluation was based on life-cycle costs, and bids came in under estimated costs. For general civil works, an integrated design&build contract with target price is anticipated. Risk allocation in contracts is specific for each case, and contingency requirements are adjusted depending on contract models.

There are no lower-cost options available for project financing than the ones currently used by MH. In the case of the KCN, there are contractual arrangements with Manitoba Hydro concerning the raising of their share of the project costs. The KCN are getting advice from experienced advisors in this regard. Current thinking is that MH will extend its borrowing advantages to the KCN, in order to avoid borrowing from third parties at high rates, and that the KCN would have to provide equity and debt in a ratio of at least 1:6.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, financial management plans provide for well-considered contingency measures for all environmental and social mitigation plans and commitments; and processes are in place to anticipate and respond to emerging risks and opportunities.*

Mitigation and compensation expenditures are fully integrated into project budgets and contingencies have been provided for. Adaptive management, capable of responding to both risks and opportunities, of social and environmental issues is built into project plans, including financial plans. For example, a provision is made in project budgets for a fish ladder if it should become necessary.

Criteria met: Yes

## 9.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *The project can manage financial issues under a range of scenarios, can service its debt, can pay for all plans and commitments including social and environmental, and access to capital can be demonstrated.*

Borrowing is not undertaken by MH specifically for its share in this project (and possibly for funds to lend to the KCN for investing their share), but for its broader capital expenditure program. As confirmed by various rating agencies, the likelihood that MH would not be able to service its debt, or that the provincial government would have to activate its guarantee towards MH, is very low.

Access to capital is subject to decision by the provincial government; it is considered very likely that borrowing for the Keeyask projects and other elements of the expansion plan will be granted if all environmental and other approvals are obtained and the NFAT process is successfully concluded, i.e. it is demonstrated before the panel that the Keeyask project is the best available option for the province.



Given the in-depth understanding of social and environmental issues, it is very unlikely that any major unforeseen expenditure would arise that the project budget, and ultimately MH and the province, could not handle.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the project can manage financial issues under a broad range of scenarios.*

MH is aware that scenarios are conceivable where multiple adverse influences on the financial performance of the project occur simultaneously. For example, if a drought were to coincide with technical problems, a rise in interest rates and/or a fall in export prices, the rate of return for the investors might drop below expectations. Such low-probability scenarios need to be considered in all commercial investments. However it is highly likely that the project will continue to be able to meet its legal and contractual financial obligations to authorities, lenders, employees, recipients of compensation payments, contractors, suppliers etc. Given its long operating life, it would remain financially viable, as it is likely that adverse circumstances would be temporary, the project would receive the backing of MH and ultimately the province, and would recover financially. Temporary drops in profitability could be a more significant problem for the KCN, given their lower level of resources and less diversified investment portfolio, than for MH and the province; however the investment arrangements for the KCN involve some protection against downside risks.

Criteria met: Yes

## 9.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 9.3 Scoring Summary

It is highly likely that the Keeyask project, under a range of different scenarios, will be able to generate sufficient revenue to meet all required social and environmental costs, service its debt and pay for all legal and contractual obligations so that it would be able to continue generating power over the long run. There are no significant gaps against proven best practice, resulting in a score of 5.

Topic Score: 5

## 9.4 Relevant Evidence

<b>Interview:</b>	15, 16, 23, 48, 57, 67
<b>Document:</b>	26, 47, 70, 116, 137, 174, 176
<b>Photo:</b>	None

## 10 Project Benefits (P-10)

This topic addresses the additional benefits that can arise from a hydropower project, and the sharing of benefits beyond one-time compensation payments or resettlement support for project affected communities. The intent is that opportunities for additional benefits and benefit sharing are evaluated and implemented, in dialogue with affected communities, so that benefits are delivered to communities affected by the project.

### 10.1 Background Information

The project planning has involved the analysis of a number of additional benefits and benefit-sharing opportunities for local communities including: pre-project training opportunities; employment opportunities and hiring preferences for local communities; business opportunities through directly-negotiated contracts (DNCs); capacity building and provision of funding for joint management of environmental studies and monitoring plans and; investment facilities and potential joint project ownership for Keeyask Cree Nations partners (KCN).

The Burntwood Nelson Agreement (BNA) 2011 between Manitoba Hydro (MH) and the Allied Hydro Council (AHC) of Manitoba (the labour union) contains provisions relating to the recruitment, referral, placement, training and retention, outlining preferences for northern aboriginals and northern residents. The Joint Keeyask Development Agreement (JKDA) of 2009, between KCN and MH, sets out understandings related to potential income opportunities, training, employment and business opportunities. The project can have a positive influence on the Manitoban and Canadian economies through the purchase of materials and equipment, labour supply, payments to the provincial and federal governments (e.g. payroll tax, personal income tax, fuel tax and provincial sales tax) and project-related income.

The Hydro Northern Training and Employment Initiative (HNTEI) is a multi-year training initiative designed to prepare northern Aboriginal residents for employment on MH projects, was implemented by the Wuskwatim and Keeyask Training Consortium, a partnership made up of Manitoba, Canada, Nisichawayasihk Cree Nation, Tataskweyak Cree Nation (TCN), War Lake First Nation (WLFN), Fox Lake Cree Nation (FLCN), York Factory First Nation (YFFN), the Manitoba Keewatinowi Okimakanak (MKO) and the Manitoba Métis Federation (MMF).

There are also a number of commitments made in the Adverse Effects Agreements (AEAs) to improve KCN livelihoods and living standards beyond compensation with the purpose of strengthening KCN cultural identity, values, traditional skills and knowledge; and previous agreements with the KCN further compensate for impacts caused by previous developments in line with the KCN worldview. These are addressed further in topics P-13 and P-15.

As a consequence of the project access road, travelling times from Gillam to Thompson will be reduced, navigation conditions in the area of the future reservoir will be safer (due to reduced water velocity) and road conditions on the Provincial Road 280 will be improved. Manitoba businesses will have the opportunity to bid on contracts through the Buy Manitoba programme, and the “Northern Purchasing Program” promotes the participation of northern aboriginal businesses in MH’s economic activities. These are addressed under P-12.

### 10.2 Detailed Topic Evaluation

#### 10.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment of opportunities to increase the development contribution of the project through additional benefits and/or benefit sharing strategies has been undertaken; and the pre-project baseline against which delivery of benefits can be evaluated post-project is well-documented.*

The assessment of opportunities to increase the development contribution of the project through additional benefits has been undertaken through the negotiations, between 1998 and 2009, between MH, TCN and WLFN, and from 2002 to 2009 with YFFN and FLCN. Discussions between representatives of KCN and MH about forming a business partnership prompted the identification of options to share the wealth and opportunities generated from KCN traditional area. Through this process, KCN leaders were able to identify opportunities to achieve greater economic prosperity for their communities.

The outcome of the negotiations on benefit analysis resulted in the Agreement in Principle (AIP) in 2000 between TCN and MH. In 2003, WLFN joined TCN to form the Cree Nations Partners (CNP) and signed the AIP. The AIP is now superseded by the JKDA (2009) between MH and all the KCN; FLCN, TCN, WLFN and YFFN.

The AIP set out the framework for the JKDA and potential benefits for the KCN. In 2002, the KCN and MH signed the negotiating principles and process proposal for concluding the JKDA. The JKDA provides KCN the opportunity to become part-owners of the Keeyask project, by investing 25% and receiving proportional revenues (CNP 15%, FLCN 5% and YFFN 5%). This division of the opportunity for partnership equity investments was undertaken considering the population of each KCN, such that revenues would be proportional.

In parallel, discussions between the town of Gillam, FLCN and MH since the mid-2000s led to commitments to projects and initiatives beneficial for the town of Gillam and FLCN and their relationships, such as the Harmonized Gillam Development (HGD) process (see Management findings).

The Environmental Impact Statement (EIS) socio-economic supporting volume provides the relevant baseline conditions and sources of information and indicators that will be used to monitor the effectiveness of the benefit-sharing options. The baseline covers historical context, employment, business opportunities, income, cost of living, education and training opportunities, resource economy, population, services and infrastructure.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, broad considerations have been taken into account in identifying opportunities.*

Broad considerations have been taken into account during the analysis of opportunities for additional benefits /benefit-sharing from 2000 to 2009 as part of the development of the JKDA. For example, the assessment of opportunities involved extensive consultation with KCN concluded with the JKDA, which includes legally binding terms for the delivery of the benefits for aboriginal communities. It takes into account their KCN views, historical context, culture and traditional knowledge relevant to their role in the Partnership's environmental and regulatory affairs. The project partnership gives KCN the opportunity to invest in the project and become full business partners. MH protects the KCN from potential risks and facilitates their initial investment through loans at preferred rates. The assessment of opportunities considers the lessons learned from other projects e.g. Wuskwatim; using a similar model of partnership with affected aboriginal communities where MH provides capacity building in the region and advisors.

The project sought separate licences and approvals for the construction of the Keeyask Infrastructure Project (KIP) and Keeyask Generation Project (KGP); this allows construction of the northern access road and the main camp area, through DNCs, bringing benefits earlier than otherwise possible.

Criteria met: Yes

## 10.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Project benefit plans and processes have been developed for project implementation and operation that incorporate additional benefit or benefit sharing commitments; commitments to project benefits are publicly disclosed.*

The JKDA is the main document outlining the project-benefits commitments. It establishes responsibilities for MH, the KCN and the partnership including responsibilities for providing management services; allocates finances in Canadian dollars (CAD) where appropriate; and identifies time and other targets to be achieved. Targets and actions contained in the JKDA and processes developed to implement the agreement include: income opportunities – Members of the KCN will be involved in the Board of Directors and Board Committees; training opportunities – The JKDA indicates that CAD 62 million will contribute to training initiatives. The HNTEI ran from 2001/02 – 2009/10 and was designed and implemented by northern aboriginal partners to prepare their members for employment opportunities on the Wuskwatim and Keeyask projects; Business opportunities – The JKDA identifies 15 work packages on project construction for direct negotiation with KCN businesses; Employment opportunities – The JKDA sets a target of 630 person-years of employment during construction.

The JKDA also sets aside an annual budget of CAD 900 000 to support the KCN in designing and implementing a framework to meet operational jobs target.

A number of other initiatives and mechanisms have been developed to increase aboriginal employment for the Keeyask project including: employment preferences set out in the BNA and the Manitoba's Job Referral System<sup>2</sup>; DNCs as set out on schedule 13.1 of the JKDA; the creation of an advisory group on employment during construction; and tender specifications for contracts that will encourage the employment of northern aboriginals. The proposal review process is described in schedule 13-2 of the JKDA

Management of the implementation of the JKDA commitments for MH will be undertaken through the partnership-implementation section. MH-internal processes include a Sharepoint site matrix of the JKDA implementation, which sets out the MH departments' responsibilities for implementation and its status. Similar management arrangements and monitoring will be undertaken by each KCN to ensure adherence to the JKDA. The JKDA also requires follow-up, monitoring and reporting activities, and the partnership will have a construction advisory committee and a Monitoring Advisory Committee.

MH and FLCN signed the Joint Statement on HGD in 2007. Since then, the multi-lateral HGD committee process, consisting of MH, FLCN, the Town of Gillam and Province of Manitoba, has considered a number of issues, especially as they relate to development in the Town of Gillam. The HGD process is considered in the Town of Gillam development plan.

The JKDA and the EIS (which references the HGD) are publicly disclosed and available on MH's website as well as on the KCN's websites. The BNA is also available on MH's website.

**Criteria met: Yes**

## Analysis against proven best practice

**Scoring statement:** *In addition, processes have been developed to anticipate and respond to emerging risks and opportunities.*

Risks and opportunities have been incorporated into the development of the JKDA based on MH's lessons learnt from similar projects undertaken in partnership with Cree nations, e.g. the Wuskwatim project.

Examples of risks considered include: The partnership equity option includes risk-protection provisions allowing for favourable lending rates and mechanisms to allow for steady cash flows and the sharing of profits before the loans are paid off; and preferred share options with less risk; There have been some previous inconsistencies for Cree-nation members trained under pre-project training initiatives, associated with the failure to secure a job at the end of the training, however, this is not a significant gap and MH is currently undertaking a monitoring review and audit of the training programme to provide recommendations for improvement prior to the construction of the KGP; If construction-employment targets set in the JKDA are not met, up to CAD 3 million will be extended to the partnership working groups on operational jobs. Payments are

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<sup>2</sup> <http://www.gov.mb.ca/jrs/keeyask/index.html>

included in the agreement to cover certain risks and; Annual integrated financial forecasts are prepared, taking into consideration factors such as inflation, exchange rates, export prices, etc. Results of the annual reports are public.

Examples of opportunities considered include: possible re-negotiations, e.g. the JKDA indicates “Hydro agrees with the KCN to re-negotiate the employment-related provisions of the JKDA prior to a Substantial Construction Start”, and “where reasonable, Hydro will continue to assess the feasibility of further work packages” [...] “considering in particular any increased capabilities of KCN Businesses to successfully undertake the required work”; partnership committees, the Aboriginal Community Employment and a Cross-Cultural Committee will be established to address potential risks and opportunities and; the FLCN environmental report indicates that the HGD process involved the identification of past challenges and opportunities for mutual gain.

Criteria met: Yes

## 10.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The assessment and planning process relating to project benefits has involved appropriately timed, and often two-way, engagement with directly affected stakeholders; ongoing processes are in place for stakeholders to raise issues and get feedback.*

Between 1998 and 2009, the planning, benefits assessment and development of the JKDA took place, involving engagement and negotiations with directly-affected stakeholders (KCN and the town of Gillam). Interviews with directly-affected stakeholders indicate that engagement was appropriately timed and two-way.

Negotiation meetings took place during the development of the JKDA; the core negotiating group was formed by KCN’s community representatives, advisors, and technical committees and included commercial terms and business opportunities. The JKDA was ratified by all KCN in 2009, through a referendum undertaken at each of the KCN communities. The referendum rules and processes are described in schedule 20-1 of the JKDA. The HNTEI initiative was run from 2001/02 – 2009/10 to prepare Northen Aboriginal residents for employment. Ongoing forms of engagement that allow directly-affected stakeholders to raise issues and get feedback related to project benefits include: KCN partners representation on the Board of Directors and Board Committees; ongoing communication with community leaders and attendance to community meetings; Consultation meetings required by the EIA process were undertaken in KCN communities, Churchill, Gillam and Thompson; the JKDA describes the dispute resolution process with timeframes and; the HGD includes a regular process of interaction to discuss issues of interest to FLCN and the town of Gillam.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

Interviews with KCN community members and representatives for the town of Gillam indicate that engagement activities described under level 3 undertaken during the development of the JKDA have been inclusive and participatory (further information is provided in P-1).

KCNs’ Chiefs, Councillors, Members, Elders and youth have participated actively during the JKDA development and contributed with their views through interviews, questionnaires, community meetings, technical committee meetings; and they will have an active role in the management and monitoring of the JKDA commitments. Key examples are the referenda process and ratification of the JKDA, and the HGD; other examples of inclusive and participatory engagement are described in the EIS and KCN’s environmental reports.

Interviews with directly-affected stakeholders indicate that feedback on how issues raised have been taken into consideration, has been thorough and timely (further information is provided in P-1).

Criteria met: Yes

## 10.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans deliver benefits for communities affected by the project.*

The scoring statement has been interpreted here as “Plans **will** deliver benefits...” since it is too early to see the delivery and implementation of most of the JKDA commitments. It is expected that the project will deliver benefits for project-affected communities through income and investment opportunities and facilities, training, business opportunities and employment. The Keeyask partnership model is based primarily on the experience of a previous project, Wuskwatim, which has delivered a similar range of benefits to those proposed in the JKDA and described under management above.

The EIS indicates that an allocation of up to CAD 19.6 million has been made for three different categories of training in the CNP communities: designated trades; non-designated trades and; business and administration. Over 600 individuals participated in these training.

The JKDA is a legally binding agreement, which defines the partnership’s governance structure, clear responsibilities for the parties involved, budget/targets, financing agreements and time frames, where relevant.

The construction of the KGP has not commenced yet, but the KIP is starting to deliver some of the expected project benefits, for example: pre-employment training opportunities have been delivered through the HNTel; on the job training programmes are in place as part of the KIP; and DNCs have already been awarded to CNP, FLCN, and YFFN and these are in line with schedule 13-1 of the JKDA. KCN are expected to earn substantial profits working on construction (most of it from DNC) and hiring preferences have been applied for the KIP as described in the BNA.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans deliver significant and sustained benefits for communities affected by the project.*

Most of the affected communities’ interviewees indicated that the project will deliver significant sustained benefits for their communities. Most of the KCN interviewees view the project as an opportunity to compensate communities for impacts caused by other projects in the past. This is also documented in the KCN environmental reports, e.g. the CNP’s homeland ecosystem model predicts a better situation with the JKDA and the Keeyask AEAs than with current conditions.

The revenue generated through the partnership will be deposited in individual KCN trusts, and each KCN will decide how it will be invested; one of the conditions of the JKDA is that revenues will be invested in activities that the community decide, e.g. new infrastructure. This sustained income generation will contribute to local development. The compensation payments set out in the AEAs will also be deposited in a trust fund and employed for mitigation-programme activities. In the long term, the AEAs and mitigation programmes will strengthen the KCN culture and traditional knowledge and practices.

Training and work experience in project construction and other project-related activities will provide affected communities with new skills that allow them to find other stable jobs in the future.

Criteria met: Yes

## 10.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 10.3 Scoring Summary

The assessment of project opportunities to contribute to additional benefits has been undertaken through the development of the JKDA and the HGD. The JKDA has been developed between 1998 and 2009 involving extensive negotiations and inclusive and participatory consultations with KCN. A number of mechanisms have been developed to implement the JKDA (e.g. training initiatives, employment referral system) and respond to emerging risks and opportunities (e.g. potential for re-negotiation). MH and FLCN signed the Joint Statement on HGD in 2007 in relation to the development of the Town of Gillam.

The JKDA is a publicly available and legally binding agreement that includes commitments to provide employment and hiring preferences as well as training and business opportunities. It also sets out the financial arrangements of a project partnership with CNP, FLCN and YFFN to potentially share 15%, 5% and 5% of the revenue respectively, based on the individual KCN populations. Baseline conditions are documented in the EIS and KCN's environmental reports.

The project will generate significant and sustained benefits to directly-affected communities through the implementation of the JKDA and the AEAs, and the decision by the community regarding investment of potential project revenues, if they decide to become investing partners. It will also provide capacity building and an opportunity to strengthen the KCN culture.

There are no significant gaps at the level of proven best practice, resulting in a score of 5.

Topic Score: 5

## 10.4 Relevant Evidence

<b>Interview:</b>	6, 17, 27, 28, 29, 30, 37, 62
<b>Document:</b>	1, 2, 3, 4, 12, 45, 46, 47, 57, 59, 60, 64, 67, 70, 73, 129, 131, 148, 174
<b>Photo:</b>	None



# 11 Economic Viability (P-11)

This topic addresses the net economic viability of the project. The intent is that there is a net benefit from the project once all economic, social and environmental costs and benefits are factored in.

## 11.1 Background Information

The province of Manitoba has a population of 1.25 million and a diversified, steadily growing economy, to which electricity generation from hydropower makes an important contribution. Electricity rates are among the lowest in North America, which increases real incomes of households and makes businesses more competitive. In terms of exports, total annual exports from the province are in the range of CAD 10-12 billion. Manitoba Hydro's (MH's) extra-provincial sales in the past year (most of which go to the USA) have been CAD 363 million; this is expected to increase to CAD 1 574 million twenty years from now. Total annual investment in the province is also in the range of CAD 10-12 billion, so that MH's capital expenditure programme of CAD 19.5 billion between 2012 and 2022 is significant. MH's ongoing operations provide 16 580 person-years of employment annually, and the next two large capital projects, Keeyask and Bipole III, are expected to create another 18 000 person-years of direct, indirect and induced employment.

The Keeyask project is an integrated part of MH's expansion plan, and is not analysed by MH as a stand-alone project but as an element of various possible development scenarios. It is also a major and unique economic opportunity for the Keeyask Cree Nations (KCN). The project's economic justification is closely linked to its financial viability (P-9) and to the demonstrated need for the project, and alternatives to address that need or opportunity (P-3). The so called multiple-account cost-benefit analysis (MACBA), to be performed as part of the upcoming Needs-For-and-Alternatives-To (NFAT) review, will expand the financial analysis of the project by factoring in costs and benefits accruing to other parties beyond the investors, such as affected communities, citizens/taxpayers and customers/ratepayers, by looking at the distribution of costs and benefits across different parties, and performing other adjustments on parameters such as the discount rate.

It is recognized that the main categories of costs and benefits that require quantification are the following: environmental costs and benefits that remain after mitigation, for example the value that people assign to the loss of wilderness, the value of increased fish populations, or the value of displaced GHG emissions; social costs and benefits that remain after mitigation, for example employment within the local Cree communities, where there is significant underemployment, or effects of improved access and increased traffic on communities; one rationale for the project is as a vehicle for regional socio-economic development and a way to address legacy issues from past hydro developments with high social costs and few social benefits; economic costs and benefits to citizens of the province, for example as recipients of increased taxes and fees paid by MH and as guarantors of MH's incremental debt; economic costs and benefits to customers, regarding the implications of the project for rates paid by MH customers in the province and in export markets. (A cost-benefit analysis undertaken from the perspective of the province only, would disregard transboundary economic effects).

## 11.2 Detailed Topic Evaluation

### 11.2.1 Assessment

#### Analysis against basic good practice

**Scoring statement:** *An assessment of economic viability has been undertaken with no significant gaps; the assessment has involved identification of costs and benefits of the project and either valuation in monetary terms or documentation in qualitative or quantitative dimensions.*

Many elements of and data required for an economic analysis are already available in the project documentation and just need to be structured and combined appropriately. A cost-benefit analysis was

undertaken for the last major MH project (Wuskwatim). Other Canadian utilities are also using comparable methodologies to support their planned hydro generation projects in regulatory reviews and public hearings. The NFAT review to be conducted for Keeyask, from the perspective of the province, will require an economic analysis, and preliminary work such as the formulation of Terms of Reference is already being initiated.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and includes sensitivity analyses.*

Expectations as to the required breadth of considerations in cost-benefit analyses appear to be increasing in Canada, and indications are that the upcoming NFAT review will take a broad look at the justification of the project.

MH regularly uses risk or sensitivity analysis in its forecasting. For example, its most recent publicly available 20-year Integrated Financial Forecast considers implications of changes of some underlying assumptions (domestic load growth, interest rates, foreign exchange rates, export prices, capital expenditures and hydrological conditions) on rates. Results show for example, that a reduction in interest rates by 1% would lead to annual rate reductions by 0.9% and that a recurrence of the historic five-year drought (1987-1992) would lead to annual rate increases by 2.5%. More elaborate sensitivity analyses, using a probabilistic framework, will be conducted for the NFAT review.

Criteria met: Yes

## 11.2.2 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The results of the economic viability analysis are publicly disclosed.*

MH publicly discloses a broad range of documents with relevance to financial and economic viability. The upcoming MACBA and other NFAT documents will be part of the public record. There are some restrictions on public disclosure of prices in long-term export sales agreements, but these may be reviewed confidentially during NFAT proceedings.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *The economic viability analysis is publicly disclosed.*

As stated above, the upcoming MACBA and other NFAT documents will be part of the public record.

Criteria met: Yes

## 11.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *From an economic perspective, a net benefit can be demonstrated.*

Analyses to date suggest that an overall net benefit of the current expansion plan of MH, including the Keeyask project, will be achieved. In addition to that, there are several positive aspects (compared to an alternative scenario without major new hydropower generating stations and interconnections) not fully captured in a summary value such as the net present value of the project, namely lower rates in the long term, higher revenues to the provincial government, positive socio-economic benefits for northern communities, reduced greenhouse gas emissions, and high asset values at the end of the 35-year assessment period.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the project benefits outweigh project costs under a wide range of circumstances.*

Analyses to date suggest that the economic benefits but also the risks to the MH expansion plan, including the Keeyask project, are higher than for the alternative scenario without major new hydropower generating stations and interconnections. This is a **significant gap**. There are scenarios under which the expansion plan yields a marginal overall net benefit (in particular, if a high discount rate is chosen and the benefits of lower rates in the long term and high asset values at end of the analysis period are given a lower weight in decision making).

Criteria met: No

## 11.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There is not enough evidence at this stage to argue that benefits of the project outweigh costs under a wide range of circumstances.

1 significant gap

## 11.3 Scoring Summary

This assessment was undertaken before the economic analyses of the Keeyask project have been finalised. MH is on track to deliver documentation to the public NFAT review which will comprehensively address the issue of economic viability of the Keeyask project, in the context of various development scenarios, and can then be challenged and tested in the public review process. Preliminary analysis suggests that the choice for or against Keeyask may depend on risk perceptions and investment horizons. The more risk-averse decision-makers are in the short- to medium-term, the more they will tend towards a scenario without Keeyask; however this may forego significant benefits for the province in the long term, as well as distributional and environmental benefits.

There is one significant gap against proven best practice, in that positive outcomes of the economic viability analysis cannot at this stage be assured under a wide range of circumstances, resulting in a score of 4.

Topic Score: 4

## 11.4 Relevant Evidence

<b>Interview:</b>	16, 23, 35, 45, 48, 49
<b>Document:</b>	70, 119, 124, 128, 174, 175, 176, 180
<b>Photo:</b>	None

## 12 Procurement (P-12)

This topic addresses all project-related procurement including works, goods and services. The intent is that procurement processes are equitable, transparent and accountable; support achievement of project timeline, quality and budgetary milestones; support developer and contractor environmental, social and ethical performance; and promote opportunities for local industries.

### 12.1 Background Information

The Keeyask Hydropower Limited Partnership (KHLP) is responsible for undertaking: the Keeyask Infrastructure Project (KIP); and the Keeyask Generation Project (KGP). The KIP was approved/licensed in March 2011 and construction began in 2012, with a scheduled completion period of 30 months. The KGP is undergoing licensing at the time of writing; work on the KGP is expected to begin in the summer of 2014, with the commissioning of the first turbo-generator set scheduled for December 2019. A third component of the overall Keeyask development is the Keeyask Transmission Project (KTP), which will be designed, contracted, owned and operated by MH. The KTP commissioning schedule is linked with the scheduled first evacuation of power from the KGP (December 2019)

Procurement is assessed in the context of the KHLP, which specifies that MH will design, construct and operate the KGP as part of its operating system as well as provide financing for project construction.

Further relevant information on project scheduling and contracting can be found in P-6.

### 12.2 Detailed Topic Evaluation

#### 12.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *An assessment of major supply needs, supply sources, relevant legislation and guidelines, supply chain risks and corruption risks has been undertaken with no significant gaps.*

Major supply needs and sources have been assessed in the Keeyask Project Implementation Plan (KPIP). Options were considered from the province of Manitoba, outside of Manitoba and within Canada and from outside of Canada. A separate study was made of the current competitive construction market, which determined the best approach towards procurement of civil works for the Project. MH will subcontract virtually all services and supplies to build the Project. Procurement involving the Keeyask Cree Nations (KCN) will be primarily through directly-negotiated contracts (DNCs). All other procurement, including the general civil, electrical, mechanical and transmission contracts, will be publicly tendered.

Relevant legislation and agreements that contractors would need to meet e.g. with respect to labour laws and occupational health and safety, are well understood. These include the Burntwood Nelson Agreement (BNA) that governs employment on Northern Manitoba hydroelectric projects. Supply-chain risks are well understood in MH and have informed procurement strategies and management measures to minimise or mitigate risks. Corruption risks are understood.

Criteria met: Yes

## Analysis against proven best practice

**Scoring statement:** *In addition, the assessment includes opportunities for local suppliers and local capacity development.*

For the Keeyask projects, MH employs a three-pronged vendor-preference programme encompassing the Manitoba Content Policy, the Northern Purchasing Policy and DNCs involving the KCN.

The primary tool for implementing the Manitoba Content Policy is to encourage vendors to employ Manitoba resources in contracts awarded by MH. According to the policy “if two bids, all things being reasonably equal with respect to price and technical acceptability, are submitted, the bid with the largest Manitoba content will receive the award”. Where the premium required does not exceed the corporation’s limits, and there are significant potential economic benefits (i.e., in terms of tax revenues), the provincial government will be offered the option of paying the difference between the low tender and the closest price offered on a technically acceptable bid with a significant amount of Manitoba content.

Under its Northern Purchasing Policy, MH encourages participation in contract and employment opportunities by First Nations, northern communities and businesses within the Northern Affairs Boundary through the following measures: information sharing; scoping; restricted tender or DNCs; aboriginal and northern content provisions; industrial offset initiatives; prioritisation of contract awards and payment of a premium.

In accordance with the Joint Keeyask Development Agreement (JKDA), several construction (including the North and South Access Roads), services, labour and materials “work packages” i.e. contracts, at a total estimated cost of CAD 203.1 million in July 2007 dollars, are being undertaken or offered to the KCN as an opportunity under contract to MH, as DNCs. The DNCs are also expected to build capacity in the KCN and prepare them to participate in future bids. Because of conflict of interest issues, the KCN will not be eligible to bid on the principal KGP contracts

Criteria met: Yes

## 12.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Procurement plans and processes have been developed for project implementation and operation with no significant gaps.*

Procurement (called purchasing in MH) processes, including policies and project-procurement plans, are well-defined both for competitively bid contracts and DNCs. A total of forty-five contracts are expected to be required to construct the project, including engineering, supporting infrastructure, civil works, electrical, mechanical, and services contracts.

According to MH’s purchasing policies, competitive tendering is the preferred method of procurement. Tenders are distributed by paper, facsimile, or by MERX Tenders (Canada’s leading electronic tendering service). The tendering method depends on the estimated value of the contract and/or the complexity of the transaction, such as: low-value purchase; request for proposal, RFP; request for quotation, RFQ; and specification, SPEC. MH may precede the tendering process with requests for information, such as: request for information, RFI; and request for pre-qualification, RFPQ. Submitted tenders are evaluated using pricing and other evaluation criteria as stated in the bidding documents.

Under the KPIP, MH sets out how the lots will be procured, including the schedule for competitively bid projects. There is a formal opening of tenders within MH, without the participation of the bidders. A two-track tender approval process is in place involving MH’s line department ( in this case, the Keeyask Engineering & Construction Department as well as other relevant departments – See P-6 for more details) and the Purchasing Department (PD), with the PD having the ultimate authority in contract award. “Sign off” authority on contract award are at increasingly higher line manager levels (including MH’s Board), in accordance with the size of the

contract. The contract is issued by the PD. Debriefing meetings can be requested by the unsuccessful bidders for larger contracts. While complaints by unsuccessful bidders are logged (and subject to audit), they are not considered a major issue, amounting to only one or two a year. As explained in P-6, contract implementation is closely monitored.

Article 13 (Business Opportunities) as well as Schedules 13-1 (Identified Work Packages and Allocation), 13-2 (Proposal Review Process) and 13-3 (Bonding Requirements) of the JKDA set out the procedures for putting in place DNCs between the KCN and MH. Where relevant, the BNA, or any collective agreement governing the Keeyask Project in place of the BNA, shall apply. The identified work packages, set out in Schedule 13-1, are allocated amongst the KCN as follows: CNP-60%; Fox Lake-20%; and York Factory-20%; according to population.

In summary, procurement plans have been thoroughly prepared for project implementation, including for projects to be undertaken by the KCN partners, with no gaps.

**Criteria met: Yes**

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities; sustainability and anti-corruption criteria are specified in the pre-qualification screening; and anti-corruption measures are strongly emphasised in procurement planning processes.*

Processes to anticipate and respond to emerging risks include staff dedicated to procurement, human resources, logistics, interfaces and contract management, and regular meetings and reports that would pick up items of importance (See P-6 for a more detailed description).

Procurement processes have also responded to emerging opportunities through developing innovative approaches in the design, construction and installation of electro-mechanical equipment. An innovative approach is also being followed in the selection of a civil-works contractor for the KGP, which follows the Integrated Design Build Model. This is expected to reduce project risk and budget, and optimise the construction schedule.

MH takes a number of steps to promote ethical behaviour in contracting. In relation to the purchase of goods and services, MH's Code of Ethics states that it is based on sound business criteria such as price, quality, quantity, delivery, service and duly approved purchasing preferences (for example, affirmative-action programmes). Purchases should not be made if MH could be subject to valid criticism or embarrassment should the details of the purchase become public knowledge. MH also subscribes to the Code of Ethics of the Purchasing Management Association of Canada; Conflict-of-interest policies are in place for members of the board, officers, and employees; MH also has an Integrity Program on which it reports in its Annual Report; As explained above, with the objective of minimising bias, MH follows a two-track procedure in awarding contracts and; In Clause 3 of the DNCs, MH requires that "the Contractor shall be liable for the due and proper observance, both by itself, and by its employees, agents and Subcontractors, of all statutes, by laws, rules and regulations in any way affecting or relating to the Work, which are lawfully imposed by any federal, provincial or municipal authority".

In relation to sustainability, detailed construction Environmental Protection Plans (EPPs) have been developed for all construction contracts. These include EPPs for the KGP (at this stage in draft form), KIP, KTP, and the South Access Road (draft). These plans comprehensively identify risks and the specific measures required of each contractor to manage these risks. At the time of bidding, MH issues its EPP with its tender documents and expects the bidders to provide their EPPs to ensure that they provide evidence that they can adhere to MH's requirements.

However, anti-corruption measures are not explicitly addressed in either MH PQ or contract documents; nor are they emphasised in procurement-planning processes. This is a **significant gap** against proven best practice.

**Criteria met: No**

## 12.2.3 Conformance / Compliance

### Analysis against basic good practice

**Scoring statement:** *Processes and objectives relating to procurement have been and are on track to be met with no major non-compliances or non-conformances, and any procurement related commitments have been or are on track to be met.*

While work on the major contracts is not planned to begin prior to the summer of 2014, procurement is on track with no major non-compliances and non-conformances. The procurement commitments to the KCN, under the JKDA, are on track to be met

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, there are no non-compliances or non-conformances.*

The Keeyask Projects (KIP and KGP) are on track to have no non-compliances and non-conformances, particularly since these projects are building on experience from the Wuskwatim Project. An internal audit was conducted of the Wuskwatim procurement procedures early in the project. The audit uncovered a few non-conformances related to the procurement methodology utilised for the project, and made some recommendations to address them. These recommendations have since been applied to the Keeyask Projects.

Criteria met: Yes

## 12.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Procurement of works, goods and services across major project components is equitable, efficient, transparent, accountable, ethical and timely, and contracts are progressing or have been concluded within budget or that changes on contracts are clearly justifiable.*

Implementation of ongoing contracts with the KCN are broadly on track (with the exception of the construction of a bridge on the Northern Access Road, which is not on the critical path) and expected to be within budget. Procurement of the major project components (works, goods and services) is on track to be equitable, efficient, transparent, accountable, ethical and timely and to be completed within budget. This is in line with MH's recent corporate experience in managing hydropower generation projects, such as the Wuskwatim project, where there were no issues raised related to the equitable procurement of works, goods and services. The process was transparent, timely, and work package leads were accountable for procurement outcomes. Changes to contracts and budget were transparent, clearly justified and followed established corporate procedures.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, opportunities for local suppliers including initiatives for local capacity development have been delivered or are on track to be delivered.*

Under the DNCs provided for in the JKDA, the KIP is providing major contract opportunities for the KCN partners. These are on track to be delivered. According to KCN, some of the additional benefits of DNCs include: development of skills in planning, constructing and managing the work packages, initially in the framework of joint venture (JV) agreements; development of training and employment programmes to maximise the number of community members employed; improving and developing community infrastructure; enhancing and strengthening the capacity of existing KCN businesses; and identifying other DNC services-related business opportunities.



## 12.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There is no significant gap against basic good practice

0 significant gaps

### Analysis of significant gaps against proven best practice

Anti-corruption criteria are not explicitly addressed in contract documents nor emphasised in procurement-planning processes.

1 significant gap

## 12.3 Scoring Summary

Manitoba Hydro is responsible for all procurement related to the Keeyask Infrastructure Project and the Keeyask Generation Project. Detailed procurement strategies have been prepared based on a thorough assessment of supply needs and sources, relevant legislation and guidelines. Supply-chain and corruption risks are well understood.

Several construction, supply, labour and materials contracts are being undertaken by the KCN under direct negotiated contracts; these contracts will also aim to develop the capacity of the KCN to tender for further contracts. All other contracts are publicly tendered in accordance with Manitoba Hydro's purchasing policies, which provide for unbiased decision-making within a clear ethical and sustainability framework. The one significant gap relates to the absence of explicitly addressing anti-corruption measures in PQ and contract documents as well as in procurement-planning processes.

Procurement commitments to the KCN are on track to be met. Based on Manitoba Hydro's overall extensive experience with procurement, including with the Wuskwatim project, there are no expected non-compliances and non-conformances. Procurement of the major project components is expected to be well managed by Manitoba Hydro.

There is one significant gap against proven best practice, resulting in a score of 4.

Topic Score: 4

## 12.4 Relevant Evidence

<b>Interview:</b>	15, 44, 57, 69, 70
<b>Document:</b>	12, 18, 28, 47, 70, 97, 98, 99, 104, 106, 109, 110, 111, 114, 116, 142, 156, 182
<b>Photo:</b>	None

## 13 Project-Affected Communities and Livelihoods (P-13)

This topic addresses impacts of the project on project affected communities, including economic displacement, impacts on livelihoods and living standards, and impacts to rights, risks and opportunities of those affected by the project. The intent is that livelihoods and living standards impacted by the project are improved relative to pre-project conditions for project affected communities with the aim of self-sufficiency in the long-term, and that commitments to project affected communities are fully delivered over an appropriate period of time.

Topic P-15 “Indigenous Peoples” that follows specifically addresses a sub-set of project-affected communities.

### 13.1 Background Information

The most important project-affected communities are the four Keeyask Cree Nations (KCN) communities and the communities of Gillam and Thompson.

Issues related to KCN and other indigenous peoples groups will be dealt with in topic P-15.

The Local Government District (LGD) of Gillam is Manitoba Hydro’s (MH) northern base for hydropower development, and already has three large dams and power plants within its borders. The town of Gillam, located within the LGD of Gillam, has about 1 300 residents, most of whom are dependent on MH for the livelihood. The population estimates for the near future indicate a doubling in 5-10 years’ time to between 2 300 and 2 800 people, primarily as a result of the expected influxes related to the Keeyask and other hydropower projects on the lower Nelson river.

Thompson is known as the “hub of the north”, being the major centre for services in northern Manitoba. It started as a nickel-mining town in the 1950s and has grown to a population of around 13 000 (2007 numbers). It has also developed into the a primary service centre for the First Nations and Métis aboriginal peoples of northern Manitoba, and the aboriginal population of Thompson is growing rapidly. The town is the location for many Government agencies, e.g. the Northern Health Region. The future of mining in Thompson is somewhat unclear at the time of writing. Plans for mine closures and concurrent prospecting activities make projections for future mining employment uncertain. Developing businesses are winter-testing of technical equipment such as cars, helicopters and snowmobiles and wilderness-orientated tourism.

The Burntwood Nelson Agreement (BNA) 2011 between MH and the Allied Hydro Council (AHC) governs the preferential treatment of northern aboriginals and other northern-Manitoba residents in regards to e.g. employment and skills training.

This topic is closely inter-dependent with several other topics, the most notable being: P-15 which focusses on the project-affected indigenous peoples; P-1 which deals with general aspects of the consultations and communications; P-10 which deals with project-derived benefits and the sharing of those with the affected peoples; P-17 which deals with physical cultural heritage and P-18 which covers public health.

### 13.2 Detailed Topic Evaluation

#### 13.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment of issues relating to project affected communities has been undertaken with no significant gaps, utilising local knowledge.*

The EIS's extensive socio-economic assessment volume with appendices include detailed analyses and impact identification regarding the historical context, the local resource economy, infrastructure and livelihoods, including heritage and other cultural aspects (dealt with in detail in P-17).

The key impacts on Gillam were identified as: demand for new infrastructure; expansion of the town; transportation of equipment, materials and people to and from the construction site(s) as well as social effects of adverse interaction with the labour force. Key impacts on Thompson will mainly concern infrastructure and services due to the influx of non-local construction workers to the region.

The town of Gillam has its own planning process involving extensive issues assessment which has employed specialist planning consultants. The public has been able to identify key issues relevant to future development: lack of choice in housing; lack of land for development; and the lack of a sense of community for all citizens. Increased pressure on health services and the police force from the influx of large amounts of construction workers to the area is another identified concern. The town of Thompson has developed a vision for what it calls a Second Generation of Development, focussing strongly on sustainable growth.

The Public Involvement Plan (PIP) has identified stakeholder communities beyond those directly affected, and governed consultations with these for the identification of relevant issues.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

There has been a clear focus in the assessment of the project on issues of employment, training and business opportunities in northern Manitoba in general, responding to the project-induced rapid growth of the labour force in the area.

The PIP process takes care of the indirectly-affected people/communities and gives them a voice in project development. Furthermore, the licensing procedures and the public hearings in the "Needs For and Alternatives To" (NFAT) and Clean Environment Commission (CEC) processes provide further guarantees for broad considerations of both risks and opportunities. There is a potential that some business owners in e.g. Thompson may feel competition for labour resources from the project, in that Keeyask construction will offer higher-paying jobs than low-wage opportunities in Thompson and other urban centres can offer.

However, the risks associated with increased pressures on the health-care system, primarily in Gillam, but also in the greater northern Manitoba area, have not been given a high significance in issues identification. This is dealt with under Management below, and also in greater detail in P-18, where the significance of this gap is analysed and scored.

Criteria met: Yes

## 13.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Management plans and processes for issues that affect project affected communities have been developed with no significant gaps including monitoring procedures, utilising local expertise when available; and if there are formal agreements with project affected communities these are publicly disclosed*

The Joint Keeyask Development Agreement (JKDA) and the Adverse Effects Agreements (AEAs) are legally enforceable, publicly available agreement that focus on the issues of the directly-affected communities and management of project benefits and impacts (see P-10 and P-15 for further details on management and implementation of the JKDA, and the AEAs respectively).

Many of the management plans are under development as the Environmental Protection Program. This programme is divided into three distinct sub-sections: Environment Protection Plans (EPPs); Environment Management Plans and Environmental Monitoring and Protection Plans (EMPPs). These plans will address, respectively: site-specific construction impacts; issues-based environment management; and monitoring of impacts utilising both western-science and traditional aboriginal knowledge. The Monitoring Advisory Committee and federal and provincial regulators will provide oversight.

The town of Gillam has published a detailed development plan in 2012, covering the time period up to 2040. Monitoring is included with a requirement for major review of results and targets every 5 years.

One of the two major residential areas of the FLCN is contiguous with the town of Gillam (the Kettle Crescent urban reserve). Any FLCN member who does reside in the town of Gillam has voting rights there. Together with MH and the Province of Manitoba, the two entities run the Harmonized Gillam Development (HGD) process.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities.*

The principal risk is that of worker interaction. Several mitigation measures address this issue, including: cultural training for all construction workers; lounge and recreational facilities of high quality in the construction camps – to encourage the workers to remain in camp during their spare time; public visits to the camps will be restricted and shuttles will be provided between Thompson/Gillam and the work sites – to reduce the need for private vehicles in camp. Dialogue with the police in both Gillam and Thompson will be ongoing throughout construction, in order to identify worker-interaction issues and respond to these.

A multi-party process to discuss the detailed means of managing worker-interaction issues for all MH-proposed projects in the vicinity of Gillam will start before the start of construction. The parties will initially include Fox Lake Cree Nation, the town of Gillam and MH, and, as required, Tataskweyak Cree Nation.

There is no clearly defined management response to the risks associated with increased pressures on the health-care system, primarily in Gillam. This is a gap at this level, but dealt with in P-18, where, to avoid double-counting, the significance of this gap is analysed and scored.

Criteria met: Yes

## 13.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *Engagement with project affected communities has been appropriately timed and often two-way; ongoing processes are in place for project affected communities to raise issues and receive feedback.*

Engagement, mainly through the EIA process, with directly-affected stakeholders has been appropriately-timed, convincingly two-way and conducted in good faith by all parties.

The PIP has engaged other relevant project-affected stakeholders, most of whom (mainly non-KCN or Gillam residents of northern Manitoba) mainly have an interest in the business and/or employment opportunities potentially generated by the project. The feedback mechanisms of the PIP are thorough and detailed.

There is a wide range of processes in place for raising issues and providing and receiving feedback, including the regular liaisons between MH and the town of Gillam.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with project affected communities has been inclusive and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

Engagement has been both inclusive and participatory, exemplified by processes mentioned under basic good practice above. Feedback has been thorough and timely throughout the process, exemplified by e.g. the summaries of rounds 1 and 2 of the PIP on the partnership's web site and examples of communication given in the EIS. Interviewees, e.g. the mayor of Gillam, attest to the high level of engagement and attention to issues raised.

The HGD includes a process of interaction to discuss issues of common multi-lateral interest to FLCN, the town of Gillam, MH and the Province of Manitoba.

More details regarding general stakeholder engagement is given under P-1.

Criteria met: Yes

## 13.2.4 Stakeholder Support

### Analysis against basic good practice

**Scoring statement:** *Affected communities generally support or have no major ongoing opposition to the plans for the issues that specifically affect their community.*

There is no major ongoing opposition to the Keeyask project in the project-affected communities. The towns of Gillam and Thompson are generally supportive and see mainly potential development opportunities as a result of the Keeyask project, as evidenced by their respective development plans.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, formal agreements with nearly all the directly affected communities have been reached for the mitigation, management and compensation measures relating to their communities.*

There are no formal agreements with the towns of Gillam and Thompson specifically addressing the mitigation, management and compensation measures relating to Keeyask-induced impacts to their communities. However, Gillam's socio-economy is intricately linked with MH, and the Town of Gillam Development Plan contains provisions for a hydropower construction-induced doubling of the population in the near future and also details an MH investment programme worth around CAD 350 million in the town over the next 10-15 years, focussing on e.g. infrastructure and services such as day-care and commercial space. The assessors consider this a strong, if indirect, statement of agreement with the plans for further hydropower in the vicinity of Gillam. This can be considered a formal agreement regarding the desirability of the Keeyask project.

The Thompson and Planning District Development Plan and Thompson's Sustainable Community Plan define MH as one of several important partners in driving its development, and identifies future hydropower development as an opportunity.

The assessors acknowledge that the bulk of the attention regarding stakeholder engagement and support during project preparation has focussed on the directly-affected First Nations dealt with in detail in P-15. Accordingly, the lack of a formal agreements with the town of Thompson is assessed as a non-significant gap against proven best practice, especially since neither the town's Development Plan nor the Sustainable Development Plan identifies future hydropower construction in the region as anything but an opportunity.

Criteria met: Yes

## 13.2.5 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans provide for livelihoods and living standards impacted by the project to be improved, and economic displacement fairly compensated, preferably through provision of comparable goods, property or services.*

The town of Gillam is preparing for a more sustainable future. The influx of business potentially caused by the Keeyask project would make it possible to expand services such as health, recreation and education, as well as creating a stable private housing market. Continued and increased construction and other investments on the part of MH will compensate for the limited residual negative impacts.

The improved business opportunities will extend also to Thompson.

The improved access roads will reduce travelling time between Gillam and Thompson and improve road safety. More details on the benefits deriving from the project for the affected communities are given in P-10.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition plans provide for livelihoods and living standards that are impacted by the project to be improved with the aim of self-sufficiency in the long-term; and the project contributes to addressing issues for project affected communities beyond impacts caused by the project itself.*

The long-term impacts on livelihoods and living standards in the communities of Gillam and Thompson are likely to be positive. Improved skills provided through the Hydro Northern Training and Employment Initiative (HNTEI), and through the direct project-related, short- and long-term employment opportunities and operation of businesses servicing the project will improve self-sufficiency in the long term. Through management, compensation measures, development programmes such as the HGD, and the upgrading of the PR 280 road, the project will address issues beyond direct project impacts.

Criteria met: Yes

## 13.2.6 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no gaps against proven best practice.

0 significant gaps

## 13.3 Scoring Summary

The assessment of impacts on project-affected communities has focussed on the EIS, HGD and the Gillam Development Plan, the JKDA and the BNA.

The JKDA was signed in 2009. The JKDA contains a number of processes for addressing project-affected people's livelihoods such as training and employment opportunities.

Stakeholder engagement with the towns of Gillam and Thompson has been appropriately-timed, two-way, participatory and inclusive through the EIA regulatory consultation process. There is no major opposition to the Keeyask project in the affected communities. However, there are no formal specific agreements with the towns

of Gillam and Thompson governing the mitigation, management and compensation measures relating to Keeyask-induced impacts to their communities. Given that project preparation has focussed stakeholder engagement and support activities on the First Nations, and that the development plans of both towns explicitly list MH investments in future hydropower construction as distinct opportunities, this is considered a non-significant gap against proven best practice.

There are no gaps against proven best practice, resulting in a score of 5.

**Topic Score: 5**

## 13.4 Relevant Evidence

<b>Interview:</b>	4, 12, 14, 21, 62
<b>Document:</b>	1, 2, 3, 4, 9, 12, 13, 46, 47, 57, 58, 62, 63, 64, 65, 66, 70, 73, 75, 79, 85, 86, 115, 143, 148, 161, 162, 164
<b>Photo:</b>	None



## 14 Resettlement (P-14)

This topic addresses physical displacement arising from the hydropower project development. The intent is that the dignity and human rights of those physically displaced are respected; that these matters are dealt with in a fair and equitable manner; and that livelihoods and standards of living for resettles and host communities are improved.

Topic P-14 Resettlement was not assessed. It is considered Not Relevant for this project as there will be no physical displacement resulting from the Keeyask development.

## 15 Indigenous Peoples (P-15)

This topic addresses the rights, risks and opportunities of indigenous peoples with respect to the project, recognising that as social groups with identities distinct from dominant groups in national societies, they are often the most marginalized and vulnerable segments of the population. The intent is that the project respects the dignity, human rights, aspirations, culture, lands, knowledge, practices and natural resource-based livelihoods of indigenous peoples in an ongoing manner throughout the project life.

### 15.1 Background Information

This topic addresses a sub-set of the project-affected communities addressed in P-13. In the case of the Keeyask project, a bulk of the directly project-affected communities are First Nations.

Canada's federal Indian Act governs who can claim status as an indigenous person (in terms of the act – "Status Indian") and who cannot – "Non-Status Indians". "Status Indians" are entitled to a wide range of programmes and services offered by federal agencies and provincial governments. In 2006 about 15% of Manitoba's population, or approximately 175 000 people, were of aboriginal descent. Of these, around 100 000 were "Status Indians", 72 000 Métis (of mixed aboriginal and European heritage), close to 600 were Inuit and the remainder classified as "Non-Status Indians".

The Crown, as set out in subsection 35(1) of the Constitution Act of 1982 (often referred to as "section 35"): *"has a legal duty to consult with Aboriginal peoples about any action or decision (including enacting a law or regulation) that might adversely affect the exercise of an Aboriginal or treaty right, before taking that action or making that decision. The Crown must also reasonably accommodate concerns about the effects of the decision or action raised in the consultation by the Aboriginal peoples, by attempting to substantially address those concerns"*. These consultations are conducted by the provincial and federal authorities in addition to any and all consultations undertaken by Manitoba Hydro (MH) and the Keeyask Hydropower Limited Partnership (KHLPP) directly on behalf of the Keeyask development and planning.

Apart from the project-affected indigenous peoples defined in this topic, there are other aboriginal groups living in the project-near area, including: Cross Lake First Nation (Pimicikamak Cree Nation); Nisichawayasihk Cree Nation (partners with MH in the nearby Wuskwatim project, located on the Burntwood river) and; the Manitoba Métis Federation (MMF, representing people who trace their descent to mixed First Nations and European heritage). Beyond these, also the Norway House Cree Nation; the O-Pipon-Na-Piwin Cree Nation; the Shamattawa First Nation as well as the Manitoba Keewatinowi Okimakanak and the Keewatin Tribal Council. The PIP has identified stakeholder communities beyond those directly affected, and governed consultations with these for their representation and their identification of relevant issues.

The Northern Flood Agreement (NFA) was signed in 1977. This addresses compensation for legacy issues in regards to earlier hydropower developments in northern Manitoba.

This topic is closely inter-dependent with P-1, P-10, P-13, P-17 and P-18.

### 15.2 Detailed Topic Evaluation

#### 15.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment of the representation of indigenous peoples in the project affected community, their rights, risks and vulnerabilities, and any cultural sensitivities and needs has been undertaken with no significant gaps, utilising local knowledge and expertise.*

There are four directly-affected indigenous communities: Fox Lake Cree Nation (FLCN), Tataskweyak Cree Nation (TCN), War Lake First Nation (WLFN) and York Factory First Nation (YFFN), together known as the Keeyask Cree Nations (KCN). TCN and WLFN work together on the Keeyask development, as the Cree nationa Partners (CNP). According to the EIS, the 2006 (most recent available census) populations of the four KCN listed above were, respectively: 1 010; approximately 3 000; 235; and 1 060. This includes members living off-reserve, amounting to almost half of the total. These latter people predominantly live in other locations around northern Manitoba, e.g. Thompson, Gillam and Churchill. The population of the KCN is young and with a high growth rate.

MH has supported the KCN with funding for their participation in assessment and negotiation, including funds for hiring consultants to aid the First Nations in these respects.

Formally, the assessment of impacts on the four KCN has been guided by the Keeyask Environment and Regulatory Protocol, which has established a number of committees and processes involved in securing a comprehensive assessment process, including the Partners' Regulatory and Licensing Committee (PRLC), the EIS Coordination Team (ECT), and a number of multi-lateral key-issues working groups as well as bi-lateral (between MH and each KCN) environmental-studies working groups. These committees and processes are guarantees for appropriate representation of indigenous points of view and cultural sensitivity.

The KCN have conducted their own environmental assessments based on the Cree worldview. This has resulted in one "western"-style science-based assessment and three ATK-based assessments (one each from CNP, YFFN and FLCN) fully internalising Cree spiritual and cultural knowledge and expertise. The western scientific assessment and the ATK-based assessments were brought together in the central document for the EIS (i.e. the "Response to the EIS Guidelines"). As a part of this process, the KHLP has also produced a DVD entitled "Keeyask – Our Story" (available on the partnership's web site, in both Cree and English), presenting the Cree worldview and the issues confronting the KCN when considering their potential participation in the Keeyask project.

The EIS's extensive socio-economic assessment volume with appendices include detailed analyses of the historical context, the local resource economy, infrastructure and livelihoods, including heritage and other cultural aspects (dealt with in detail in P-17). One of the most relevant factors to come out of the assessment is the fact that the KCN population is young with high population growth rates, meaning that a large number of people will enter the labour force, looking for employment, in the near future. Other important impacts identified include: construction-worker interactions; fishing; trapping; aesthetics; and the spiritual connection to the land.

The KCN will not lose any of their reserve or treaty land, the project will be constructed entirely on Provincial Crown Land within the Treaty 5 Adhesion area.

Keeyask socio-environmental assessment reports have been publicly disclosed on the internet and are also being made available in hard copies through the future development offices and public registries in other northern communities. Key documents have been summarised and translated into Cree.

**Criteria met: Yes**

### **Analysis against proven best practice**

**Scoring statement:** *In addition, the assessment has been undertaken with the free, prior and informed participation of indigenous peoples; and the assessment takes broad considerations into account, including both risks and opportunities.*

The involvement of the project-affected First Nations described above under basic good practice has been undertaken with the free, prior and informed participation of the KCN themselves as evidenced by their own Environmental assessments and the co-operation as parts of the KHLP in all project planning.

The co-operation with the KCN, through project-design choices and reiterations, development of the JKDA and the AEAs as well as the KCNs' own environmental assessment demonstrate attention to broad considerations and also address both risks and opportunities. The KCNs' own assessments focus on their spiritual attachment to "Askiy", the word used to describe all animate and inanimate parts of nature, their interrelatedness to each other. Everything and everyone on Askiy is sacred, a fact that governs the Cree approach to resource management.

The lack of participation in direct assessment work on the Keeyask project by a few indigenous groups is considered an insignificant gap, given that there are open communication lines to these communities and some, notably the MMF, are presently negotiating about their participation in Keeyask planning. These groups will also be involved in the upcoming "section-35 consultations" to be conducted by the province of Manitoba.

Criteria met: Yes

## 15.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Plans and processes have been developed for project implementation and operation to address issues that may affect indigenous peoples in relation to the project; and formal agreements with indigenous peoples are publicly disclosed.*

Each of the four KCN has its own agreement with MH, regulating compensation for legacy issues in relation to past hydropower developments in northern Manitoba.

More than a decade of negotiations between the KCN and MH culminated in the signing of the Joint Keeyask Development Agreement (JKDA) in 2009, and the creation of the KHLP. The JKDA is a legally enforceable agreement governing e.g. project development, potential income opportunities, training, employment and business opportunities for the KCN (see P-10 for further details on management and implementation of the JKDA and P-2 for the governance of the agreement). The Adverse Effects Agreements (AEAs) are also legally enforceable agreements between each individual KCN and MH, signed in the first half of 2009. The AEAs are directed at impact avoidance, mitigation, replacement and compensation in an appropriate order and focus on improving KCN livelihoods and living standards beyond compensation, strengthening cultural identity, values and aboriginal traditional knowledge (ATK) and skills. They aim do this by focusing on e.g. resource-access programmes; environment-stewardship programmes; healthy-food programmes; traditional lifestyle, culture and Cree-language programmes; youth programmes as well as oral-histories programmes. The intent is to maintain and strengthen the KCNs' spiritual relationship to the land. The Monitoring Advisory Committee (MAC) will guarantee the participation of local expertise in monitoring and management of mitigation and compensation.

There are several subject-specific management plans prepared, such as the Waterways Management Plan, Reservoir Clearing Plan, Sediment Management Plan, the CNP Moose Harvest Sustainability Plan and many others referenced in the specialist topics of this assessment.

The Burntwood Nelson Agreement (BNA) 2011 between MH and the Allied Hydro Council (AHC) governs the preferential treatment of northern aboriginals and other northern-Manitoba residents in regards to e.g. employment and skills training.

The JKDA, the AEAs and the BNA are legally enforceable, publicly available agreements that focus on the issues of the directly-affected KCN communities and management

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans and processes have been developed with the free, prior and informed participation of indigenous peoples; processes are in place to anticipate and respond to emerging risks and opportunities; and plans are supported by commitments that are public, formal and legally enforceable.*

The AEAs are developed with the free, prior and informed participation of the KCN and, as stated above, legally enforceable and publicly available. They are based on the understanding that past negative experiences of hydropower project-induced impacts going beyond predictions make it necessary to adopt an adaptive-management approach to the monitoring of mitigation implementation, ensuring that if impacts deviate from, or exceed, the predictions, effective measures can quickly be put in place.

The AEAs contain programmes for e.g.: resource-access (e.g. access to fish from water bodies unconnected to the Nelson river); community and commercial centres; Cree language; land/environmental stewardship; gravesite restoration; traditional life/knowledge (e.g. wilderness access for youth, school programmes etc.); crisis centres and counselling services; oral histories and cultural sustainability. There is some variation between the individual AEAs, responding to each First Nation's priorities.

The MAC will play an important part in flagging issues and identifying opportunities for potential improved mitigation. If unforeseen effects appear during the project, there is clear language provided in the AEAs to revise the programmes and respond to changed opportunities and management needs.

Plans have been developed with free, prior and informed participation of the project-affected aboriginal communities. MH has provided the funding for community participation in both planning and the development of management plans. The many committees and processes involved in securing a comprehensive assessment process mentioned under Assessment above are a guarantee for appropriate representation of indigenous points of view and cultural sensitivity, including translations to Cree when necessary.

The ATK-based assessments provide spiritually and culturally appropriate inputs to plan and process development. The monitoring of AEAs with participation of ATK expertise will provide a strong tool for addressing risks and responding to opportunities. The MAC will also play an important part in flagging issues and identifying opportunities for potential improved mitigation.

Beyond the mitigation and compensation agreed upon, the JKDA includes provision for the KCN to enter into a project-ownership arrangement by investing their own money according to a defined plan. This plan calls for a decision before the start of construction and, at that time, a small investment. The bulk of the investment would have to be made at the end of construction. At that time, the individual KCN can choose between two different investment option, the so called "preferred" (all loans from MH are forgiven) or the "common" (loans will be repaid from profits). The "common" approach has potential upsides while the "preferred is a more secure approach. With either option, the guaranteed minimum return on investment will be equal to MH's cost of long-term borrowing less 1.5%, which is currently projected to be approximately 4.8%.

As stated above, all relevant plans, such as the JKDA and the AEAs, are publicly available legally formal and enforceable documents.

Criteria met: Yes

## 15.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *Engagement with indigenous peoples has been appropriately timed, culturally appropriate and two-way with self-selected community representatives; and ongoing processes are in place for indigenous peoples to raise issues and get feedback.*

Engagement with directly-affected stakeholders has been appropriately-timed, convincingly two-way and conducted in good faith by all parties. Examples of engagement are the long-standing negotiations between the KCN and MH on the preparation of the AEAs and the JKDA as well as formation of the KHLF.

The participation of community elders and other community members was fundamental to the review of cultural models (see P-17) and the development of traditional-knowledge studies by the KCN themselves.

Within the KCN communities, the leaderships and the future development offices have run a number of processes including working and reference groups for the KCNs' own environmental assessments, community meetings, meetings in the major towns and cities that are home for members residing off-reserve (e.g. Gillam, Thompson, Churchill and Winnipeg), and web sites, both the Keeyask project site and the First Nations' own web sites, all four KCN have their own site.

The PIP has engaged other aboriginal groups and will continue to do so in round 3, about to take off. Rounds 1 and 2 dealt with issues-identification and preliminary EIA results, respectively. Round 3 will deal with the results of the EIS, assisting stakeholders in their interpretation of the results.

There is a wide range of processes in place for raising issues and providing and receiving feedback, including the future-development teams, the MAC and ATK-based participation in the formal environmental monitoring programmes. The web sites mentioned above also play an important role.

The Crown Consultations, so called Section 35 consultations, adds a provincial and a federal Government-run process (often implemented by consultants) of stakeholder engagement specific to aboriginal peoples, see also P-1.

Indirectly-affected indigenous groups have been engaged through the Public Involvement Plan (PIP). Some groups have either been difficult to reach or are now engaged in reaching agreements on how to participate in the assessment and development process.

**Criteria met: Yes**

### **Analysis against proven best practice**

**Scoring statement:** *In addition, engagement with indigenous peoples has been inclusive and participatory; feedback on how issues raised have been taken into consideration has been thorough and timely; and directly affected indigenous peoples have been involved in the decision-making around relevant issues and options.*

Engagement has been both inclusive and participatory, exemplified by processes mentioned under basic good practice above. As described in detail under P-1, engagement has used sub-groups in the communities based on age (elders, youth) and community roles (trappers involved in both impacts identification and monitoring). Attention to people who are uncomfortable with English has been addressed by including Cree translation in community meetings

Feedback has been thorough and timely throughout the process, exemplified by e.g. the summaries of rounds 1 and 2 of the PIP on the partnership's web site and examples of communication given in the EIS. In the KCN, the future-development teams provide the most direct feedback mechanism. The JKDA contains a well-defined dispute-resolution process. For more details on feedback on stakeholder engagement, see P-1.

The KCN are parts of the KHLF and as such have been comprehensively involved in the identification of issues and options, as well as decision-making on how to address these.

**Criteria met: Yes**

## 15.2.4 Stakeholder Support

### Analysis against basic good practice

**Scoring statement:** *Directly affected indigenous groups generally support or have no major ongoing opposition to the plans for issues that specifically affect their group.*

The directly-affected indigenous groups are the four KCN. They have all held referenda in democratic order with a ballot containing two separate questions – one about the signing of the JKDA and the other regarding the AEA. All communities had clear majorities for signing both, but low voter turnout. Dissenting opinions are present in the communities. These dissenting opinions mainly concern the process of development and decision-making, but there are also some concerns voiced over the project itself.

Many members view the KHL, the JKDA and the AEAs as an opportunity to “start over”, “taking back their lives” or “become whole again”. A commonly expressed opinion, especially from elders and other leaders in the communities, is that the Keeyask project is an opportunity for their community to turn things around and secure a positive future for the younger generation. The project is viewed as an opportunity to create a better future.

Some concerns are voiced by regarding the respective community’s ability to raise the funds necessary for investing in the project and some are also unhappy with the division of project stakes among the four KCN.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, consent has been sought and gained by directly affected indigenous groups for the project.*

All four KCN have held ratification referenda on both the JKDA (to participate as partners in the ownership, development and operation of the Keeyask Project) and the AEAs. All four First Nations approved the agreements and hence their participation in the project in these democratic votes, albeit with a low voter turnout. A partial explanation of the low turnout might be that many community members reside off-reserve and do not feel enough involved or affected by the issue.

The participation varied between 37% and 47% of those eligible to vote. Among these, the results varied quite strongly between the four KCN. In FLCN, the percentage of yes votes was 92% for the JKDA and 93% for the AEA, in TCN it was around 61% for both, in WLFN it was around 94% for the JKDA but around 88% for the AEA, while in YFFN it was 83% and 84% respectively.

Criteria met: Yes

## 15.2.5 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans provide for major negative impacts of the project to indigenous peoples and their associated culture, knowledge, access to land and resources, and practices to be avoided, minimised, mitigated or compensated with no significant gaps, and some practicable opportunities for positive impacts to be achieved.*

The AEAs, in combination with skills training, employment and business opportunities, are on track to improve KCN livelihoods and the AEAs focus on replacement of resource access rather than compensation, including access to hunting and fishing as a means to practice traditional livelihoods. The extensive environmental protection and monitoring programmes are on track to avoid, minimise, mitigate and compensate negative impacts to indigenous peoples. Some examples of avoidance and minimisation are given under topic P-4. The AEAs contain a series of programmes designed to help strengthening KCN cultural identity, values, traditional



skills and knowledge, thereby providing a positive impact. The feeling that the project has a clear potential to provide a positive net outcome is also documented in the Cree Nation Partner's (TCN+WLFN) own environmental assessment where their homeland ecosystem model predicts a better situation with the JKDA and the AEA, than with current conditions.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, opportunities for positive impacts have been thoroughly identified and maximised as far as practicable.*

While the decision to invest in the project or not has yet to be made by the KCN, such a decision would make them full business partners with MH in the project, sharing in project revenue. Together with the improved skills provided through the training programmes, the experience from employment, the operation of businesses servicing the project through the directly-negotiated contracts (DNCs) and the long-term jobs guaranteed by the JKDA, will improve self-sufficiency in the long term.

The range of programmes have been identified in close co-operation with the project-affected indigenous communities and respond well to their concerns and priorities. The opportunities in training, employment and business have a high probability of creating a net positive impact on the concerned communities. In the long term, the AEAs and mitigation programmes will help strengthening the KCN culture, traditional knowledge and practices.

The opportunities-identification process has been very comprehensive, and the ongoing monitoring and opportunity for re-negotiation given by the JKDA and AEAs will assist in maximising the positive benefits as far as is practicable.

Criteria met: Yes

## 15.2.6 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no gaps against proven best practice.

0 significant gaps

## 15.3 Scoring Summary

The assessment of impacts on project-affected indigenous communities has focussed on the EIS, the KCNs' own environmental assessment and the development of the JKDA and the AEAs and associated management and monitoring plans.

The JKDA and the AEAs were signed in 2009. The JKDA contains a number of processes for addressing impacts on the KCNs' livelihoods such as training and employment opportunities, business opportunities (e.g. the DNCs) as well as the opportunity to invest and become part-owners of the project. The JKDA also includes tools for dealing with emerging risks and opportunities, e.g. expert-review mechanisms and dispute resolution measures. Both the JKDA and the AEAs are publicly available, and legally enforceable documents.

Stakeholder engagement has been appropriately-timed, two-way, participatory and inclusive. The long time, starting from the 1990s, during which engagement has taken place has been a positive aspect in guaranteeing the depth and inclusiveness of the engagement.

Directly-affected indigenous groups have demonstrated their support for the projects through democratic referenda on both the JKDA and the AEAs in each of the four KCN. All KCN voted for, albeit with low voter turnout. The AEAs are designed to help strengthening indigenous cultural identity, values, traditional skills and knowledge. The ATK-based monitoring, the KHLF board, the MAC and the opportunity for re-negotiation given by the JKDA and AEAs will all assist in responding to risks and opportunities as well as in maximising the positive benefits as far as is practicable.

The KCN have the option to become part owners of the Keeyask project by investing their own funds. The decision to invest has to be made at the beginning of construction, but the bulk of the actual investment will only be needed at the end of the construction period, when revenues start accruing to the project.

There are no gaps against proven best practice, resulting in a score of 5.

**Topic Score: 5**

## 15.4 Relevant Evidence

<b>Interview:</b>	1, 3, 4, 5, 12, 14, 26, 27, 28, 29, 30, 37, 38, 39, 60
<b>Document:</b>	1, 2, 3, 4, 9, 12, 13, 46, 47, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 70, 73, 75, 79, 85, 86, 115, 140, 143, 148
<b>Photo:</b>	None

## 16 Labour and Working Conditions (P-16)

This topic addresses labour and working conditions, including employee and contractor opportunity, equity, diversity, health and safety. The intent is that workers are treated fairly and protected.

### 16.1 Background Information

The Keeyask Generating Station (KGP) will take eight and a half years to construct. Following the planned start of the KGP construction in 2014, its activities will include operation of the Keeyask Infrastructure Project (KIP) and construction and operation of KGP. The KGP will provide accommodation for an additional 1 500 workers beyond that needed for the KIP (a total capacity of approximately 2 000 people) and completion of the work areas. The camp and work areas will be located on an approximately 120 ha site on the north side of Gull Rapids, about 1.8 km from the Nelson River. An additional camp for approximately 100 people will likely have to be established as a temporary construction camp on the south side of the river; this will accommodate workers constructing the south access road and will use temporary bunk-house trailers and will haul in potable water as well as haul out solid waste and waste-water for disposal at existing Gillam facilities. The location of the south camp is yet to be decided.

The KIP, already licensed and under implementation, includes the construction of a start-up camp for 150 workers, north access road, a bridge over Looking Back Creek, phase 1 of the main camp to provide work force accommodations for 500 workers near Gull Rapids, work areas, power supply, a helicopter pad and garages for fire-fighting and first-aid vehicles. Construction of the KIP started in April 2012 and it is expected to conclude in 2014, prior to commencement of the KGP construction. At the time of the assessment, the start-up camp accommodated approximately 75 workers (59 men and 17 women); 4 KIP contracts were under implementation: the northern road and main camp construction; electrical and mechanical works; bridge construction; and catering services. Sigfusson Northern, the main contractor, is responsible for the coordination of the works.

Human resources and Occupational Health and Safety (OH&S) for the KIP, KGP and the Keeyask Transmission Project (KTP) are and will be managed through existing Manitoba Hydro (MH) processes. The KGP and the KIP will follow commitments set out in the Burntwood Nelson Agreement (BNA) and the Joint Keeyask Development Agreement (JKDA). The BNA is a collective bargaining agreement between MH and the Allied Hydro Council (AHC), a joint council of unions representing project construction workers. The BNA sets out hiring preferences with priority for northern aboriginal residents.

### 16.2 Detailed Topic Evaluation

#### 16.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *An assessment has been undertaken of human resource and labour management requirements for the project, including project occupational health and safety (OH&S) issues, risks, and management measures, with no significant gaps.*

A labour supply/demand model was developed to estimate the extent of the workforce required for the project. The model incorporates workforce requirements, labour-supply projections built on 2001 statistics from “Labour Canada” and occupation data on pre-project training data factors and challenges experienced in previous projects. The Environmental Impact Statement (EIS) includes estimates of the workforce demand from 2014 to 2021.

The EIS also presents the workforce-volume requirements with peak and low employment-needs projections by job category – Keeyask Cree Nations (KCN); Churchill-Burntwood-Nelson; northern aboriginal; and; non-northern aboriginals – contract type, and the employment income. The EIS indicates that the project expects to generate 4 218 person-years of employment, 3 150 person-years in designated trades and 1 068 person-years for MH and contractor personnel. 46 staff will be required during the operation phase. Workforce requirements are linked to processes to ensure availability of qualified labour, e.g. BNA and JKDA. Employment data will be monitored by partnership committees and an employment advisory group.

Specific OH&S requirements will be contained in tender and contract packages. Any issues will be dealt with through MH's health and safety system and SafetyNet (an intranet system to log OH&S incidents). Each work activity has a safe-work procedure, which lists safety risks and measures to avoid occurrence. Processes for issues identification and monitoring include safety officers on site, internal and external inspections (discretionary by the provincial officer or in case of any significant issues), daily meetings, monthly reports and a safety committee that will be available on site. Management measures are described in the management findings below.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

Assessment of labour issues has considered the experience and lessons learnt on previous projects in the region. This is evidenced through the use of processes developed and applied at the Wuskwatim Generating Station project to meet labour rights, and during the negotiations with the AHC to elaborate the BNA. The labour-force analysis of demand by job category and the hiring preferences set out in the BNA are related to the pre-project training initiative and ongoing efforts by the government to increase employability of aboriginal communities, and to reduce regional unemployment (see the EIS).

The EIS demonstrates that the workforce assessment has considered issues such as worker-interaction risks and cross-cultural differences, attraction and retention of staff, availability of skilled labour force (associated management measures are described in the management findings). Directly-negotiated contracts (DNCs) work packages have been allocated to KCN to ensure income distribution proportional to the population of each KCN, and their roles in the partnership. Other labour risks and opportunities can be identified and monitored through the contractor's weekly and monthly reports, weekly inspections, monthly safety audits, workforce-safety monitoring, the daily contractors-MH meetings, and manager-workers daily meetings. Continuous liaisons between MH and the town of Gillam can also help to identify potential risks and opportunities related to worker-interaction issues.

Criteria met: Yes

## 16.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Human resource and labour management policies, plans and processes have been developed for project implementation and operation that cover all labour management planning components, including those of contractors, subcontractors, and intermediaries, with no significant gaps.*

MH's corporate system includes over 90 policies and procedures covering, among others: discipline, travel, employee benefits, expenses and allowances, hiring and placement, salaries, training and development, and workforce adjustment and termination. MH's bargaining agreements between MH and the Association of Manitoba Hydro Staff and Supervisory Staff Employees (AMHSSE), Canadian Union of Public Employees and the International Brotherhood of Electrical Workers (IBEW) set out the working conditions, wages and salaries,

appointments and promotions, premiums and grievance mechanisms. MH have a OH&S system in place, which includes procedures for safe-work practices, healthy-living programmes, safety-management programme, training and policy development, and OH&S (e.g. safety rule book and the SafetyNet system).

Management systems and measures are aligned with MH's corporate strategic plan 2011/2012 goals. The plan also presents targets for MH's employees' accident severity rate, accident frequency rate and a zero-tolerance for high-risk incidents. The Manitoba's Workplace Health and Safety Act lists the contents required in a workplace health and safety programme. The act also requires the availability of a safety committee and safety officers on site which, accordingly, will be available for the KGP. KGP contractors are required to produce a Health, Safety and Environment Handbook (HSEH) as part of the tendering process, that should comply with the act. Assessors reviewed the list of contents of the KIP's main contractor's safe work practices and HSEH. The handbook includes a comprehensive list of policies and procedures in line with the H&S Act and MH's H&S system. Camp rules have been developed for Keeyask using the Wuskwatim model.

Evidence from the Wuskwatim project shows how MH met its commitments to hire aboriginal workers, and MH contractors' ability to reduce accident frequency in similar projects. Implementation of H&S management measures and lessons learnt from previous projects will help ensuring good H&S performance for the Keeyask project.

Detailed operational plans have not been developed yet, but this is not a significant gap. There is still enough time for the preparation of operational plans, and MH's H&S systems provide a framework for their preparation.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities.*

There are a number of regular daily, weekly and monthly meetings addressing both risks and opportunities in detail. Audits and incident reports will help identifying areas for H&S improvement and to eliminate hazards. A safety committee will also be available on site and it will be formed by the union representative on site and employees of contractors. The committee will also deal with sanitary conditions. Workers that receive training on the job (e.g. driving training) will be re-evaluated to ensure they undertake their tasks correctly over time. Record of evaluation forms will be kept on site.

Camp rules have been developed for Keeyask and include measures to address potential risks identified during the assessment such as cross-cultural training, disciplinary measures, access and security as well as H&S and camp facilities. The employment retention and support-work package will be awarded through a DNC to implement measures to retain aboriginal employees (e.g. cross-cultural office) and address emerging cross-cultural issues.

Criteria met: Yes

## 16.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *Ongoing processes are in place for employees and contractors to raise human resources and labour management issues and get feedback.*

If any MH or contractor employee wants to raise a concern, they would have to contact their supervisor, or a person in management, or bargaining-unit representative, to start the grievance procedure described in the MH's collective agreements (for MH's employees) and the BNA grievance process (for contractors). No major issues have been raised on the KIP project to date. All concerns were resolved via the manager or supervisor. A

cross-cultural office will be available on site and open every day of the week; a phone and a fax number will also be available on site and included in the camp rules for information.

As described in the BNA, any concerns regarding sanitary conditions on site that cannot be resolved, can be referred to the Project Safety Committee, and if the matter is still not resolved there, the chair of the committee can advise the senior representative of MH and contractors.

Any issues with regard to aboriginal employment can be discussed through the aboriginal community employment committee that will be in place in accordance with the Wuskwatim model.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, feedback on how issues raised have been taken into consideration has been thorough and timely.*

No major issues have been raised to the contractor on the KIP project to date and concerns have been resolved talking to the supervisor or manager on duty. Daily safety meetings also address any H&S or other concerns before the start of the day.

Interviews and similar previous project experience indicate that the Keeyask project can be expected to be compliant with the grievance procedures in place, and feedback on any concerns can confidently be expected to be thorough and timely. The BNA and MH's collective agreements describe systematically the grievance and arbitration mechanisms with specific timeframes for each step.

Criteria met: Yes

## 16.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *There are no identified inconsistencies of labour management policies, plans and practices with internationally recognised labour rights.*

There are no identified inconsistencies of labour management policies, plans and practices with internationally recognised labour rights. All contractors are required in their contracts to meet legal requirements.

Canada is a party to human-rights treaties and a signatory of the Universal Declaration of Human Rights (1948). Canada is also a signatory to 6 of the 8 International Labour Organisation (ILO) core conventions related to fundamental human rights and other related conventions; ratifications exclude C098 - Right to Organise and Collective Bargaining and C138 - Minimum Age. However, evidence indicates that the right to organise and collective bargaining has been respected and Manitoba's legislation establishes a minimum working age of 16. The ILO 2012 Report of the Committee of Experts on the Application of Conventions and Recommendations General Report and observations concerning particular countries, make specific reference to Manitoba's Employment Standards Code and cases of inconsistencies with C1 on the number of hours of work allowed<sup>3</sup>; but evidence indicates that hours of work in project plans and agreements are in line with ILO C1.

The implementation of processes and systems described under the management findings and facilities for employees to raise issues will help to identify any breaches of the BNA, and actions will be implemented.

Criteria met: Yes

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<sup>3</sup> source: [http://www.ilo.org/dyn/normlex/en/f?p=1000:13100:0::NO:13100:P13100\\_COMMENT\\_ID:2697811](http://www.ilo.org/dyn/normlex/en/f?p=1000:13100:0::NO:13100:P13100_COMMENT_ID:2697811)

### Analysis against proven best practice

**Scoring statement:** In addition, labour management policies, plans and practices are demonstrated to be consistent with internationally recognised labour rights.

Labour management policies, plans and practices are not demonstrated to be consistent with internationally recognised labour rights for any of IFC Performance Standard 2, ILO, United Nations conventions and instruments or International Organization for Standardization (ISO)/Occupational Health and Safety Assessment Series (OHSAS) 18001 standards. This is a **significant gap**.

Criteria met: No

## 16.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

Labour management policies, plans and practices are not demonstrated to be consistent with internationally recognised labour rights.

1 significant gap

## 16.3 Scoring Summary

An assessment of human resources and labour management requirements has been undertaken, taking into consideration risks and opportunities faced in previous projects of similar characteristics, including cross-cultural issues and training and use of local workforce.

Management procedures applied through MH's corporate H&S system incorporates procedures for safe-work practices, safety-management programme, training and policy development, and OH&S procedures. Provincial H&S laws and collective-bargaining agreements set requirements for labour and working conditions, with no inconsistencies found against internationally recognised labour rights. There are culturally appropriate ways for employees and contractors to raise issues and gain feedback, as described in the collective-bargaining agreements' grievance mechanisms.

Labour-management policies, plans and practices are not demonstrated to be consistent with internationally recognised labour rights. This constitutes a significant gap at the level of proven best practice, resulting in a score of 4.

**Topic Score: 4**

## 16.4 Relevant Evidence

<b>Interview:</b>	9, 27, 29, 50, 53, 54, 63
<b>Document:</b>	11, 12, 14, 19, 20, 21, 24, 29, 31, 32, 34, 41, 47, 57, 70, 71, 72, 74, 78, 82, 87, 88, 102, 103, 112, 123, 135, 146, 154, 170
<b>Photo:</b>	4, 5, 6, 7, 8 and 9



## 17 Cultural Heritage (P-17)

This topic addresses cultural heritage, with specific reference to physical cultural resources, at risk of damage or loss by the hydropower project and associated infrastructure impacts (e.g. new roads, transmission lines). The intent is that physical cultural resources are identified, their importance is understood, and measures are in place to address those identified to be of high importance.

### 17.1 Background Information

The project is located in an area with a long record of human occupation and may have been inhabited at least as early as 4 300 BP. The original inhabitants of Manitoba were nomadic aboriginal tribes (who became the present-day Cree), who lived off the land and typically followed a seasonal cycle, timing their movements to take advantage of the region's natural resources. The first Europeans to arrive to the current Province of Manitoba were fur traders in the 1600s. Since then, aboriginals were exposed to new economic and social influences that affected their way of life and culture, transforming their lives from a nomadic lifestyle to a more sedentary one.

The area is associated with the following temporal periods of recorded archaeological sites: Archaic, Middle Woodland, late Woodland, early, middle and late Cree and European Historic. The cultural landscape is identified by indigenous peoples as fundamental to the maintenance of their identity and culture, and the relationship between the Cree and the land that is the base for their practices, e.g. hunting, trapping and fishing. Each of the Keeyask Cree Nations (KCN) has their own culture and spirituality values that are based on the oral tradition from the spirits to the Elders and from the Elders to the youth (traditional knowledge) and their worldview, defined as the integral relationship with Mother Earth.

This topic addresses physical heritage resources including burial sites, the KCN's cultural landscape and natural features considered to have spiritual and cultural importance e.g. Gull rapids related to the Keeyask Generation Project (KGP), Keeyask Transmission Project (KTP) and the Keeyask Infrastructure project (KIP).). Issues related to spirituality, culture and worldview are addressed under P-15.

### 17.2 Detailed Topic Evaluation

#### 17.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *A cultural heritage assessment has been undertaken with no significant gaps; the assessment includes identification and recording of physical cultural resources, evaluation of the relative levels of importance, and identification of any risks arising from the project.*

A cultural-heritage assessment has been undertaken for the KGP, KTP and the KIP with no significant gaps. The assessments have been undertaken by Manitoba Hydro (MH), Northern Lights Heritage Services (NLHS) and KCN representatives and heritage advisors, and are included in the KGP EIS and heritage-resources supporting volume, the KTP environmental assessment report (EAR) and the KIP EIS. The scope of the study is in accordance with the requirements of the Manitoba Heritage Resources Act. The assessment of tangible physical resources includes protected objects, sites, designated areas of heritage value, heritage sites and objects, archaeological, paleontological, pre-historic, historic, cultural, natural, and scientific or aesthetics features. The assessment was based on existing records, predictive modelling, archaeological investigations, contributions, and the Aboriginal Traditional Knowledge (ATK) of the KCN.

The KIP EIS contains an assessment of heritage resources. The surveys were undertaken between 2002 and 2005 and included shovel tests and helicopter and pedestrian surveys, covering the start-up camp, the main camps and the north access road.

The KGP heritage study area was divided into 3 geographic areas, a regional study area, a local study area and a core study area. The assessment evaluates the relative levels of importance (low, medium or high) of physical heritage resources encountered using ranking values derived from the Historic Resources Branch of Manitoba Culture, Heritage and Tourism (MCHT).

The assessment identifies project activities that may affect known and undiscovered heritage resources during construction and operation. The assessment also identifies risks arising from the project, including disturbance or permanent loss of known and unknown heritage resources and burial sites, cultural landscapes (e.g. loss of rapids, earthworks, reservoir erosion and vegetation clearance) and reduced ability to provide a complete historical record. 9 heritage sites may be affected during the construction phase that will require monitoring; 43 sites of the 50 known heritage-resources sites in the study areas will be destroyed or disturbed during reservoir impoundment and operation. Assessors were advised that the landscape was filmed to create a historical record.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

The KGP assessments take broad considerations, through e.g. consistent inclusion of ATK, Elders' knowledge and the experience gained from previous projects. The assessment also considers monitoring areas outside the zone of hydraulic influence under open-water conditions e.g. Clark Lake, through the "System-wide archaeological project" undertaken between MH and MCHT. This is in response to Tataskweyak Cree Nation (TCN) and York Factory First Nation (YFFN) members' concerns on potential backwater effects. Assessors were advised that during the construction of the KGP, a GIS database of identified and potential heritage resources will be maintained.

The assessment considers risks in a variety of ways, e.g. cultural-heritage studies were undertaken at Clarke Lake and Cache Lake, and no cultural-heritage effects were identified; these sites were used historically by Aboriginal peoples but are located outside the Keeyask hydraulic zone of influence. It also considers risks of affecting aesthetics and cultural landscape and loss of natural features, and uncertainties on burial-sites locations (see findings under basic good practice, above). The assessment considers opportunities by, e.g., involving KCN community members in the assessment, and by providing training and capacity building.

Criteria met: Yes

## 17.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Plans and processes to address physical cultural resources have been developed for project implementation and operation with no significant gaps; plans include arrangements for chance finds, and ensure that cultural heritage expertise will be on site and regularly liaised with by the project management team during construction.*

The KIP EIS indicates that environmental protection plans and heritage-resources protection measures should be implemented, e.g. chance-find procedures. At the time of the assessment, assessors were told that no heritage resources were found to date at the KIP camp. The KIP construction environmental management plan describes responsibilities for the contractor, project archaeologist, the chance-find procedure, and the environmental inspector's daily-log template including heritage resources. Borrow pits will be closely

monitored for chance finds. The partnership submits a report every year to obtain heritage-resources annual permits required by the Provincial Government; assessors were advised that annual reports have been submitted since 2001.

During the KGP construction, any evidence of human occupation will be recovered and processed following the Heritage Resources Protection Plan (HRPP), and if human remains are exposed, mandated Provincial procedures will be implemented. The HRPP describes the processes that should be followed if any heritage resources or human remains are encountered and differentiates between practices for low-, medium- or high-priority sites. The draft HRPP describes responsibilities for the project archaeologist and resident manager. The EIS contains a chance-find procedure, and staff requirements including for the project archaeologist, that will advise and provide support, and for environmental officers that will be trained to conduct identifications. The plan is complemented with ATK-based monitoring programmes. The plan will be reviewed by contractors at pre-job meetings and relevant contractor's employees will have access to copies on site. Prior to impoundment, shoreline surveys will be conducted and as much physical heritages resources as possible will be recovered. In areas designated as sacred or heritage site, vegetation will be cleared by hand. Measures considered to mitigate the changes in the landscape aesthetics are rituals and ceremonies at project milestones, and counselling services. Potential effects such as increased human traffic can be mitigated through education and awareness of workers.

The HRPP and its outcomes will be reviewed by the board of directors and the Monitoring Advisory Committee (MAC, formed by MH and representatives of the KCN). The board may choose to review certain outcomes; if this was the case, the MAC would undertake more systematic and thorough review. Reports will also be provided to regulators. MH, in conjunction with the MAC, and under contract to the Partnership, will provide communication to the public. During the KGP operational phase, key mitigation measures include ongoing seasonal monitoring of the shoreline within the core study area, and in particular the reservoir area, by the project archaeologist and/or members of the KCN. This will be undertaken through the implementation of the Waterways Management Plan. A salvage strategy will be implemented to mitigate effects on the sites that will be lost or disturbed during reservoir impoundment and operation. The Environmental Monitoring and Protection Plans (EMPP) and the HRPP provide the management tools for protection of known and unknown heritages resources.

A number of mitigation programmes will be developed by the KCN to address adverse effects on physical cultural heritage resources, e.g. Gravesite Restoration Program, Traditional Knowledge Program, and Museum and Oral Histories Program. Over 20 000 artifacts have been found during Keeyask studies. In 2009, TCN's Chief requested a repatriation of the artifacts and on September 28, 2009, Manitoba Historic Resources Branch (HRB) responded, saying "HRB will accommodate and make possible a transfer of custody of these archaeological materials to TCN at a mutually agreeable time."

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities; and plans are supported by public, formal and legally enforceable commitments.*

The MAC will have the responsibility to communicate the outcomes to members of KCN communities, regulators and the general public. These processes will serve to identify both risks and opportunities and measures to act on these. If unforeseen effects appear during the project, there is opportunity to revise the Adverse Effects Agreements (AEAs) to respond to changed opportunities and management needs.

The Waterways Management Program and the Reservoir Clearing Management Plan are part of the JKDA, which is a legally-binding document and publicly available. The AEAs are also publicly available and legally binding. Commitments are made to produce a HRPP which will be publicly available in the first quarter of 2013.

Criteria met: Yes

## 17.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The assessment and planning for cultural heritage issues has involved appropriately timed, and often two-way, engagement with directly affected stakeholders; ongoing processes are in place for stakeholders to raise issues and get feedback.*

Both verbal and documentary evidence indicate that the assessment and planning for cultural issues have involved appropriately timed and often two-way engagement with stakeholders. Community input was provided by reviewing cultural models, cultural statements and traditional-knowledge studies developed by the KCN. The participation of Elders and KCN assistants provided valuable information to identify locations for field investigations in the regional-study assessment. KCN members were involved in identifying potential effects and contributing to impact-management measures e.g. Waterways Management Program.

There is ongoing communication with the MCHT through meetings and approvals of annual permits, and engagement with MH and KCN to identify grave-relocation sites in advance of the KGP construction due to the potential of encountering grave sites. Before impoundment, MH and KCN will work together to identify and contribute to impact-management measures at high-priority spiritual and heritage sites that will be flooded, and cooperate on the relocation of graves.

The ongoing consultations (see P-1 and P-5 for more detail) and meetings provide opportunities for raising issues and receiving feedback. The AEAs and the JKDA (that contains the Waterways Management Program) contain dispute-resolution mechanisms. Annual reports will be issued to the Provincial Government to obtain the permit required by the heritage resources act.

During construction, questions related to the implementation of the environmental protection measures will be directed to MH's project manager, and the HRPP will be an item on the agenda at project progress meetings.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

Engagement with directly affected stakeholders – KCN, Manitoba Aboriginal and Northern Affairs Aboriginal Consultation Unit (MANAACU) and Manitoba Culture Heritage and Tourism Unit – is inclusive and participatory through the EIS regulatory consultation processes and section 35 crown consultations; and during project planning a number of committees have been in place: the Council and Elders planning committee, water and land process and reference group, internal and external committee reference groups (see P-1 and P-5) are examples of this.

Assessors were advised that the MANAACU facilitates participatory and inclusive consultations, providing transport, culturally-appropriate events and support to Elders and other community members. Verbal evidence indicates that issues raised have been considered in a thorough and timely manner through the mechanisms described. Consideration of heritage resources issues are documented in the EIS.

Criteria met: Yes

## 17.2.4 Stakeholder Support

### Analysis against basic good practice

**Scoring statement:** *There is general support or no major ongoing opposition amongst directly affected stakeholder groups for the cultural heritage assessment, planning or implementation measures.*

There is no major ongoing opposition to the management of cultural-heritage issues in assessment, planning or implementation amongst directly-affected stakeholder groups (i.e. KCN, MANAACU and MCHT). Evidence of general support includes: involvement of KCN community members in training, field investigations, heritage-resources studies, handbooks and monitoring plans; KCN community members participation in partnership working groups, socio-economic steering committee and the regulatory licensing committee during project planning. The MANAACU representative stated that no major cultural heritage issues have been raised to date.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, formal agreements with the directly affected stakeholder groups have been reached for cultural heritage management measures.*

Commitments to cultural-heritage management measures have been formally agreed with KCN through the following documents: the Waterways Management Program in the JKDA, a legally binding document signed in 2009 by KCN members and MH ; and the AEAs (2009) which contain programmes for the mitigation and compensation of impacts on historical landscape and physical heritage resources (e.g. YFFN's Cultural-Sustainability Program, FLCN's Gravesite-Restoration Program, and the Cree Nations Partners' Museum and Oral-Histories Program). The KIP EIS, the KTP EAR and the KGP EIS contain heritage-resources measures that have been prepared in consultation with the KCN communities and the partnership.

Annual permits and the statement of the MCHT in the KIP EIS license constitutes a formal agreement between the partnership and the Provincial government to implement the measures described in the EIS, and the construction environmental plan. If the formal regulatory process approves the KGP EIS, a similar license with conditions will be in place. The KGP HRPP is currently being prepared by MH on behalf of the partnership; this plan will contain further cultural-heritage management measures that will require the MCHT's approval.

Criteria met: Yes

## 17.2.5 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans avoid, minimise, mitigate, and compensate negative impacts on cultural heritage arising from project activities with no significant gaps.*

The assessment and the management plans avoid, minimise, mitigate and compensate negative impacts on physical cultural-heritage resources arising from the KIP, the KTP and the KGP with no significant gaps. Measures described in the management findings above are directly linked to the protection of the inventory of physical cultural resources identified for the project, and the assessment of potential impacts and risks. KGP potential impacts from increased human traffic will be mitigated through education and awareness of workers and environmental officers, see above under management. Measures are in place in the Waterways Management Program and the draft HRPP to avoid and mitigate potential impacts on known and unknown physical cultural resources; the plans assign responsibilities and resources for implementation. The results will be monitored by the MAC that can provide recommendations and advice to the partnership on additional or alternative mitigation measures if required

The cultural landscape will be permanently altered with the loss of Gull rapids and other sites. The permanent loss of heritage sites will be compensated through cultural ceremonies; a video of the cultural landscape and

nature trails, and the AEAs' mitigation programmes e.g. monetary contributions to implement the Museum and Oral Histories Program and selection of sites for potential discovery of burial sites. The AEAs assign responsibilities, and allocate funding for implementation of mitigation programmes and compensation for residual effects. Some community members expressed in interviews that compensation provided may not be enough, but the AEAs offer the opportunity for amendments if unforeseen events occur during construction or operation, including changes to the landscape and the loss of rapids. Resources for implementation will be determined by the partnerships.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans avoid, minimise, mitigate and compensate negative cultural heritage impacts with no identified gaps; and contribute to addressing cultural heritage issues beyond those impacts caused by the project.*

No gaps were identified, in addition to the findings presented above at the level of basic good practice. The project contributes to addressing impacts on physical heritage resources beyond the core study area, as documented in the EIS. The "system-wide archaeological project" will assess the impacts of past hydropower projects on archaeological resources within lands and waterways adjacent to hydropower developments in Manitoba; this project is undertaken between MH and MCHT's, Historic Resources Branch, and covers areas of KCN concerns that are outside of the zone of hydraulic influence under open-water conditions. The AEAs offer the opportunity for amendments if unforeseen events occur during construction or operation.

Other examples of contributions proposed to date to address cultural-heritage issues beyond the impacts caused by the project include: preservation and storage of tangible artefacts recovered to date at either the Historic Resources Branch or in the custody of NLHS on behalf of the Province; all artefacts will be accessible to KCN and the public at the Keeyask Centre (to be located at TCN); the Keeyask centre will hold mobile heritage educational displays that will be used by the KCN; TCN approved an educational partnership with the University College of the North to provide skills and knowledge to manage small museums; the heritage-related mitigation programmes will enhance KCN historic memory and heritage identity in the long term; the project planning has provided new archaeological knowledge of the Nelson River and opportunities for research, capacity building, and knowledge-sharing between the Cree worldview and western scientific approaches.

Criteria met: Yes

## 17.2.6 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 17.3 Scoring Summary

Cultural-heritage impacts have been assessed in the EIS, including the Heritage Resources supporting volume and in the KCN environmental assessments. The assessment was based on existing records, predictive modelling, archaeological investigations and contributions and cultural knowledge from the KCN. The

assessment evaluates the relative levels of importance and considers risks and opportunities. Key impacts arising from the project are disturbance or permanent loss of known and unknown heritage resources, burial sites and cultural landscapes.

Measures are in place to manage identified impacts on known and unknown heritage resources including salvage, cultural ceremonies as well as monitoring of construction works and the reservoir shoreline before and after impoundment. Environmental protection plans, and a heritage-resources protection plan are implemented in the KIP, and similar plans (e.g. a Waterways Management Program) will be implemented through the KGP. Residual or permanent impacts are compensated through the AEAs mitigation programmes and compensation payments that include provisions for unforeseen effects.

Directly-affected stakeholders have been engaged in a participatory and inclusive manner and the heritage-resources plans have their general support. Commitments are documented in legally enforceable agreements. The plans are expected to avoid, minimise, mitigate and compensate negative impacts. The project will deliver a number of cultural-heritage contributions beyond the impacts caused by the project, including a mobile display of heritage resources, education and capacity building.

There are no significant gaps against proven best practice, resulting in a score of 5.

**Topic Score: 5**

## 17.4 Relevant Evidence

<b>Interview:</b>	2, 19, 27, 29, 30, 53
<b>Document:</b>	1, 2, 3, 4, 40, 47, 50, 51, 57, 59, 60, 67, 68, 69, 70, 73, 84, 120, 136, 140
<b>Photo:</b>	None



## 18 Public Health (P-18)

This topic addresses public health issues associated with the hydropower project. The intent is that the project does not create or exacerbate any public health issues, and that improvements in public health can be achieved through the project in project-affected areas where there are significant pre-existing public health issues.

### 18.1 Background Information

The communities affected by Keeyask face a range of public health issues, particularly non-communicable health concerns. These include: a poorly-balanced diet, resulting in a high prevalence of obesity and diabetes; alcohol and drug misuse, linked to a high incidence of violence and sexual violence; mental health, depression and anxiety; and skin conditions. The high incidence of these non-communicable health issues is related to the legacy of Canada's historical treatment of the First Nations, including previous poorly-managed impacts of hydropower developments.

Health services in the area include: health centres in Split Lake and War Lake, a nursing station in York Landing, and a community health centre in Fox Lake (Bird); a small hospital at Gillam (with 1 physician and 10 nurses), and a larger hospital in Thompson with specialist physicians. Facilities in Split Lake, War Lake and York Landing are new, having been constructed in the past 5 years. Services suffer from the difficulty of attracting qualified health personnel to the area, and retain them. All Keeyask communities fall within the area served by the Northern Health Region (NHR), and a federal First Nations and Inuit Health Branch provides services to on-reserve First Nations. Manitoba Health and Healthy Living is the provincial agency responsible for public health.

Aboriginal Traditional Knowledge (ATK) in the area includes the KCN concept of "Mino-pimatisiwin" – living a good and honourable life – and the knowledge of traditional herbal medicines, which continue to be gathered, particularly by women.

A significant public-health issue in some hydropower developments is the bio-accumulation of methyl-mercury (usually shortened to just "mercury") in the food chain. This develops in recently created reservoirs due to the methylating activity of sulphate-reducing bacteria in anoxic waters and sediments. The increase in mercury is linked to the amount of organic matter in the flooded area. Human consumption of food high in mercury can impair reproduction, growth, neurological development, and learning ability, and the development of fetuses. Conversely, campaigns to promote avoidance of natural foods may result in less balanced diets amongst the target populations.

### 18.2 Detailed Topic Evaluation

#### 18.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *A public health issues assessment has been undertaken with no significant gaps; the assessment includes public health system capacities and access to health services, and has considered health needs, issues and risks for different community groups.*

KHLP has assessed the public health impacts of Keeyask comprehensively, through the following two processes: the preparation of the EIS, particularly in the socio-economic supporting volume (regulation of public-health impacts of projects in Manitoba is addressed through the environmental regulatory process); and a Human Health Risk Assessment (HHRA) of Mercury from the Proposed Keeyask Project with its associated Technical Working Group.

The health assessment in the EIS was carried out by environmental consultants with socioeconomics specialisations, drawing upon data from Federal and Provincial authorities on mortality, birth rates,

communicable diseases, and hospitalisation. An epidemiologist and toxicologist were also retained to undertake technical aspects of the health assessment. The assessment compared health indicators to on-reserve First Nations and the wider Canadian population. There were limited primary healthcare records from which to draw conclusions, but interviews with local health professionals provided useful information (see Stakeholder Engagement below).

The HHRA was carried out using methods based on Health Canada, WHO and US EPA guidance, and has been peer-reviewed by a leading academic from the University of Ottawa. The Technical Working Group consisted of KCN representatives, Manitoba Hydro (MH), the EIS study team, and the Medical Health Officer of BRHA.

An assessment of the public-health system is included in the EIS. The assessment has considered health needs, issues and risks for different community groups, specifically the health needs of elderly people and youth. A further example of the assessment of risks for different community groups is the differentiation of permissible levels of fish consumption between women of child-bearing age, children, women beyond child-bearing age, and all adult men.

**Criteria met: Yes**

### **Analysis against proven best practice**

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

The EIS has taken broad considerations into account. Examples are: the range of community health issues assessed, closely linked to the socio-economic part of the EIS, using a WHO definition of health to include well-being, and the non-communicable issues described in the background above; the evaluation of health issues in the FLCN Environmental Evaluation Report, and (less so) in the Environmental Evaluation Report of CNP (while the York Factory First Nation report does not make specific reference to health); and consideration of the health impacts of reduced country-foods consumption, and a continuing or increasing reliance on imported processed foods that would arise from avoiding country foods on the assumption that it all has raised levels of mercury.

The KCN Environmental Evaluation Reports put great emphasis on the public-health issues related to their relationship with land and water, with the FLCN report including a specific section on human health, referring to: travel, interconnections and relationships; community cohesion; and the relation to the land. They emphasise the quality of water in the river for drinking, availability of plants and medicines, and access to natural resources. The Environmental Evaluation Reports were based around the Cree concept of *Mino pimatisiwin*.

The HHRA and Technical Working Group placed as much emphasis on the need to ensure that people continue to eat country foods (i.e. fish, bird eggs, game, and herbs), and therefore the need for a quantitative analysis of the expected mercury levels, to distinguish which country foods pose a risk and which do not.

The assessment of risks for public health has been inherent in this approach to the assessment, as most of the issues identified are a risk, rather than a definite impact. A specific example of the assessment of a risk from the HHRA is the tagging of fish to understand their movements, to determine whether there is a risk of fish (with raised mercury levels from Gull Lake) moving upstream beyond Birthday Rapids. A further example is the assessment of the risk that continuing peatland erosion would significantly elevate mercury levels.

Public-health opportunities in the project area exclusively concern KCN communities, so there is a high degree of overlap with the measures being taken to address adverse effects of the project under the AEAs. These measures respond directly to the issues identified by KCN leadership and members and the assessment of public health described above, so the assessment can be considered to have taken opportunities into account (see Management below for further information on the AEAs).

**Criteria met: Yes**

### Analysis against basic good practice

**Scoring statement:** *Plans and processes to address identified public health issues have been developed for project implementation and operation with no significant gaps.*

Plans broadly fall into four categories: the management of worker interaction (during implementation); adverse effects agreements; improved services and communications materials related to health (during implementation and operation); and wastewater management (implementation and operation).

Plans to manage worker interaction include: locating the main workers' camp on the northern shore of the river, thereby preventing direct access to Gillam, and thereby reducing worker interaction; provision of facilities at the camp of a quality that will encourage employees to remain at the camp, using a similar approach to that used for a small camp for the Kettle maintenance project; restriction of unauthorised public visits to the camp, restricting the use of company vehicles for personal use, a shuttle to transfer workers to/from Gillam and Thompson (discouraging the bringing of personal vehicles to site); a camp committee to oversee camp rules; employment of KCN members by the project on a range of construction and services contracts; the provision of security, recruitment, employee retention and support/counselling services by KCN, promoting better worker-community interactions; cultural-awareness training for all employees, a cross-cultural office on-site, and the appointment of community liaison officers; and informing RCMP of the construction schedule and the timing of the peak workforce.

Plans included in the AEAs directly address emotional well-being and dietary impacts. For example, they include resource access and use programmes (with explicit country food, community cohesion, coping and mercury objectives), a community fish programme, and cultural programmes and counselling programmes that may mitigate emotional and mental health impacts. Access programmes are currently underway, providing transport for families to visit resource management areas and traplines. Interviews on site indicate that the access programmes are popular.

Regarding improved services, KCN are making plans for improving services using revenues from the project, for example FLCN plan youth-recreation programmes and WLFN plan a youth drop-in centre. KHLP has demonstrated its ability to link KCN with service providers by a recent workshop on HIV/AIDS provided by Keewatin Tribal Council. In addition, construction workers will have medical and ambulance services provided by a contractor, to minimise the burden on local hospitals and clinics.

Plans to address the issue of mercury are integrated into the AEAs and work with the health services. Levels will remain higher than pre-project concentrations for up to 30 years (Gull Lake) and 25 years (Stephens Lake). A number of mercury-related communication products have been developed to encourage people to continue to eat fish, whilst avoiding fish with levels beyond acceptable limits. MH has already bought out a fishing operation because of concerns on high mercury-level fish getting into the food chain, and all fishing will be subject to permitting requirements. The specific measures are: all to avoid Jackfish (Northern Pike) and Pickerel (Walleye) of standard size from Gull Lake; women of child-bearing age and toddlers avoid, while men consume no more than 1 meal per week of Jackfish (Northern Pike) and Pickerel (Walleye) of standard size from Stephens Lake. All are permitted to consume Lake Whitefish from both lakes.

Plans to avoid public-health impacts arising from wastewater disposal from the power plant and workers' camp are: a waste-water treatment plant to be installed inside the powerhouse, discharging to the Nelson River, meeting Manitoba Conservation's tier 1 water quality standards; and a packaged plant installed as part of the KIP to treat camp waste-water, discharging to meet tier 1 standards to the Nelson.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities.*

There are specific monitoring plans that can be used to anticipate emerging risks, for example: monitoring of the number and type of incidents of adverse worker interactions, and of traffic incidents; annual monitoring of mercury levels in water, birds, mammals and fish during operation until maximum levels are reached and then every three years thereafter until concentrations return to long-term stable levels; continuous testing of fish for mercury from the Freshwater Fish Marketing Corporation; and the re-assessment of the HHRA every 5 years.

Response to emerging risks is addressed by clause 11.2.8 of the JKDA which states that if information obtained from ongoing monitoring discloses unanticipated adverse effects, then such effects will be addressed by KHLF, as set out in the KCN AEAs. Additional examples are: a committee being established to address worker interaction issues (involving Manitoba Hydro and Fox Lake and, as needed, TCN) which can respond to unanticipated negative worker interaction issues; the Crisis Centre, Wellness Counselling, and 'Where Do We Go From Here?' Program being established by Fox Lake as part of their AEA; and the provision for 'extra work' in the Keeyask Emergency Medical and Ambulance Services contract to address communicable disease outbreaks.

KHLF governance, including review of the AEAs and the potential to make changes to the AEA programmes, provide a process to respond to public health opportunities (though they are not specific to public health).

There is a risk that the incidence of non-communicable diseases – especially alcohol and drug abuse and related physical and sexual violence, and mental health problems – rises as a result of Keeyask, despite the prevention measures outlined above. In this event, it will be the responsibility of the statutory health service providers to respond with appropriate health services. Manitoba Hydro works with the Northern Health Region (NHR), through meetings, assistance to recruitment and retention, flying in specialist services, and a new Wellness Centre in Gillam. In addition, MH has stated that they plan to have ongoing communication with local service providers (e.g. the National Native Alcohol and Drug Abuse programme), with one-on-one meetings. However, there is no agreed process by which additional services or resources of the statutory service providers would be mobilised, for example in response to monitoring data indicating an increase in non-communicable diseases. The EIS states only that KHLF will continue dialogue with health- and social-service providers to allow these agencies to react to potential increased demands on their capacity. A further example is reference in the EIS to the need for discussions with health-service providers to help them prepare and plan for the construction period, and the assumption that they will be able to respond: for example the EIS assumes that the NHR will be able to carry out public information campaigns to address sexually-transmitted infections. In addition, there are no firm plans to respond to opportunities to improve non-communicable health conditions, irrespective of the impact attributable to Keeyask. Owing to the significance of public-health risks, the absence of detailed processes at this stage is **a significant gap** against proven best practice.

Criteria met: No

## 18.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The assessment and planning for public health has involved appropriately timed, and often two-way, engagement with directly affected stakeholders, including health officials and project affected communities; ongoing processes are in place for stakeholders to raise issues and get feedback.*

Engagement with directly-affected stakeholders has been extensive, appropriately-timed and two-way. Examples of engagement processes include: field-research programmes and community workshops; gathering of data from KCN, the Inuit Health Branch and Manitoba Health; reference groups in some KCN communities;

the use of local KCN members to carry out interviews; involvement of KCN in the HHRA Technical Working Committee, by providing information on patterns of country-foods use; and their involvement in 14 one-day workshops on mercury. Health officials have been directly involved, for example through interviews of health professionals, the gathering of data from Federal and Provincial agencies, and the involvement of the Medical Officer for the Northern Region in the Technical Working Committee on mercury.

Ongoing processes for overall engagement with directly-affected communities are set out in P-1. There are no ongoing processes in place that are specific to public health or focused on health-service providers, although there is general ongoing dialogue with some health-service providers.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

The above processes for engagement have been highly inclusive of directly-affected KCN representatives and community members through their direct involvement, and health-service providers have been interviewed. Feedback on issues raised has been provided within the meetings of the reference groups and committees, as well as feedback through the processes described under P-1.

Criteria met: Yes

## 18.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans avoid, minimise and mitigate negative public health impacts arising from project activities with no significant gaps.*

The plans described above will be sufficient to avoid, minimise and mitigate the predicted significant public-health risks of the Keeyask project: Based on recent, local experience, plans to minimise worker interaction can be expected to be effective; plans included in AEAs can be expected to be successful in mitigating adverse impacts on nutrition and emotional well-being (parts which are already under implementation appear to be popular); and, based on previous experience, plans to mitigate the impact of raised mercury levels in food sources and the associated risk of reduced consumption of natural foods can be expected to be effective.

In addition there is the possibility that, in the long term, the wealth created by partnership in the KHLP will enable KCN communities to reduce the incidence of non-communicable health problems. FLCN and Gillam residents will also benefit from reduced travel time to the hospital in Thompson.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans avoid, minimise, mitigate and compensate negative public health impacts with no identified gaps; and provide for enhancements to pre-project public health conditions or contribute to addressing public health issues beyond those impacts caused by the project.*

However, there is considerable uncertainty that the plans will prevent all significant negative impacts, and no plans to compensate for residual impacts, for example by ensuring improved health services. The EIS concludes that residual effects are expected to be adverse for the construction phase due to the risk of increased drug and alcohol abuse, worker interactions and KCN members' worries about the impending change to the environment, and a cumulative effect with previous developments.

Plans to support the capacity of health (and fitness and well-being) services in KCN communities would clearly satisfy the scoring statement's requirement for enhancements to pre-project public-health conditions or contributions to public-health issues beyond the impacts caused by the project. There are a number of plans including the programmes in Fox Lake's AEA, youth programmes, and the Wellness Centre in Gillam funded by the Gillam Region Expansion Program (providing chiropractic, physiotherapy, massage therapy, dentistry). However, it is not clear that they would enhance pre-project public-health conditions amongst KCN communities, and they do not target the high incidence of non-communicable health issues. There do not appear to be plans to reduce health-staff turnover, reduce waiting times for appointments, or extend mental-health services. Although there is a year remaining to the end of the Preparation phase, the absence of sufficiently detailed plans, which would also address the risk of significant residual impacts described here, is a **significant gap**.

Criteria met: No

## 18.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

The absence of processes to respond to an increased incidence and severity of non-communicable diseases resulting from Keeyask's development.

The absence of plans to support and enhance the capacity of health services in KCN communities and the town of Gillam to address significant pre-project public health conditions, particularly those of non-communicable diseases.

2 or more significant gaps

## 18.3 Scoring Summary

KHLP has assessed the public health impacts of Keeyask comprehensively through the EIS and a peer-reviewed assessment of impacts on raised levels of methyl mercury, and the assessment has taken broad considerations into account through a broad definition of public health and assessment in KCN Environmental Evaluation reports. Plans to manage public-health impacts concern the management of worker interaction, natural-foods access and emotional support programmes as part of KCN AEAs, and the provision of improved services and communications materials related to health. Stakeholder engagement in the identification of issues and management plans has been extensive, with both affected communities and health-services professionals.

However, owing to the seriousness and intractability of the public-health issues facing KCN communities, there remain significant risks of adverse impacts or at least a failure to enhance pre-project health conditions. KHLP is yet to develop processes to respond to an increased severity of health conditions arising from Keeyask's development, or plans to support health services to seek an improvement to significant pre-project health issues.

There are two significant gaps against proven best practice, resulting in a score of 3.

Topic Score: 3

## 18.4 Relevant Evidence

Interview:	3, 5, 25, 26, 56, 60, 62
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<b>Document:</b>	1, 2, 3, 4, 47, 51, 57, 58, 59, 60, 65, 67, 70, 76, 121, 122, 170, 199
<b>Photo:</b>	10, 11, 12 and 13



## 19 Biodiversity and Invasive Species (P-19)

This topic addresses ecosystem values, habitat and specific issues such as threatened species and fish passage in the catchment, reservoir and downstream areas, as well as potential impacts arising from pest and invasive species associated with the planned project. The intent is that there are healthy, functional and viable aquatic and terrestrial ecosystems in the project-affected area that are sustainable over the long-term, and that biodiversity impacts arising from project activities are managed responsibly.

### 19.1 Background Information

The Keeyask project is located in Canada's boreal forest, which may be the most intact forest remaining on earth, with 25% of the world's wetlands (including the world's largest peatland system in the Hudson and James Bay lowlands) and more surface water than any other continental-scale landscape. Wildlife, aquatic and plant species typically have large ranges, are relatively limited in number, and are well understood in terms of life cycles and habitat requirements, compared to other world regions.

More than 12% of the boreal region is strictly protected, and much of it is unpolluted and pristine, with few invasive species. Human alteration of northern ecosystems was traditionally limited to local pressures on some natural resources (e.g. subsistence fishing and trapping of fur-bearing animals); in recent decades roads and industrial developments such as mining, commercial logging and fishing, and hydroelectric developments have been added; and in the longer term climate change is expected to have a significant impact on these ecosystems.

Biodiversity in the project area is shaped by the prevailing low temperatures and precipitation (mean annual values of ~ -4°C and ~ 500 mm/year, respectively). The habitat types in the area immediately affected by the Keeyask project are, principally, riverine and lacustrine open waters, shoreline wetland, inland wetland, and upland forest. Biodiversity in the project area has been altered by past developments, in particular the hydropower developments on the Nelson, as well as linear developments (roads, railroads, transmission lines). Most habitats lost to these developments are shoreline wetlands (lost to inundation) and upland forests on mineral soils (preferred for linear developments). Stephens Lake, the reservoir of the Kettle project (located immediately downstream of Gull Rapids, the planned site for the Keeyask project), and its associated infrastructure allow a preview of impacts that can be expected from Keeyask. Understanding of impacts and possible mitigation and compensation measures has been expanded by past experiences of the developer Manitoba Hydro (MH), affected communities (in particular, the Keeyask Cree Nations or KNC) and regulators.

### 19.2 Detailed Topic Evaluation

#### 19.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *An assessment of terrestrial biodiversity; aquatic biodiversity including passage of aquatic species and loss of connectivity to significant habitat; and risks of invasive species has been undertaken with no significant gaps.*

The assessment of project impacts on biodiversity was conducted between 2001 and 2011 and included extensive surveys and baseline documentation, predictions of habitat loss, alteration and disturbance, and the consequent impacts on species dependent upon such habitats. The Keeyask Cree Nations have conducted their own environmental assessment, focussing on their historic experiences with reduced abundance and quality of fish and wildlife populations, as a consequence of hydropower development.

The following aquatic and terrestrial Valued Environmental Components (VECs) were identified using ecological and cultural criteria, and subsequently investigated in more detail: ecosystem diversity, intactness, wetlands functions, and priority plants; four fish species (Pickerel, Jackfish, Lake Whitefish and Lake Sturgeon); six bird species (Canada Goose, Mallard, Bald Eagle, Olive-Sided Flycatcher, Common Nighthawk and Rusty Blackbird); and three mammal species (Caribou, Moose and Beaver).

Three of the bird species are listed and protected under the federal Species at Risk Act. In addition, a subspecies of Caribou, the Boreal Woodland Caribou is listed under this Act (the area-resident Caribou is probably of a different subspecies; this is currently under investigation through tracking and genetic studies). The Lake Sturgeon (heavily affected by commercial fishing and slow to recover) is considered for listing.

Fish passage on the Nelson River has been affected by earlier developments. Results of connectivity analyses show that local fish species are generally not long-distance migrants which would need to pass up- or downstream through the various rapids, and viable populations can be found in restricted habitats as long as sufficient foraging and spawning areas (for example, in rapids or tailraces) are available. Connectivity issues and related solutions were also identified within the project area, for example between the main reservoir and a flooded lake, and the main reservoir and a creek.

An assessment of the risk of increasing the rate at which invasive plants and animals are introduced and spread was also undertaken. A number of invasive plants tend to occur in human-disturbed areas such as roadsides and two invasive fish species have become established in the Nelson River.

MH also supports ongoing research and monitoring efforts, such as the regional Coordinated Aquatic Monitoring Program, which contribute information to the Keeyask assessment.

**Criteria met: Yes**

### **Analysis against proven best practice**

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

The assessment process benefits from good background documentation (e.g. known impacts of previous projects, threatened and invasive species lists and action plans at the federal and provincial levels) and experience. It is based on a thorough understanding of ecological processes, habitat types, and physical environmental changes, an appropriate prioritisation process, and many years of fieldwork to understand plant and animal communities.

Risks to natural features in the project area have been analysed. They include, for example, the risk of producing large wildfires that would not otherwise naturally occur. While fires play an important role in shaping the ecosystem, the fire regime has been altered by human influence. This as well as other potential risks such as increased hunting pressure, are closely related with increased fragmentation and access.

A number of different conclusions if not contradictions, persist in the presentation of the assessment reports based on Western science and those based on aboriginal traditional knowledge. Examples include the questions whether water levels and therefore aquatic biodiversity on Split Lake are likely to be affected, what herds and subspecies the resident Caribou belong to, and whether populations of certain species are likely to be diminished or may even increase. The project's approach to continue research and monitoring efforts to reach a more robust consensus is prudent.

The assessment has been conducted not just with a view to documenting impacts, but with an awareness of the need to mitigate impacts and identifying opportunities to enhance natural features in the project area. This is particularly evident with respect to the four identified priority fish species. For example, early identification of their needs led to the specification of fish-friendly turbines that allow safer downstream passage; provisions are made in the design and budget of the project, in accordance with the precautionary principle, for initial trap-and-transport operations, and later physical upstream passage facilities if they should become necessary;

and MH is facilitating and funding a collaborative Lake Sturgeon management mechanism on the Lower Nelson River, with a view to also preparing for the potential future Conawapa project.

Criteria met: Yes

## 19.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Plans and processes to address identified biodiversity issues have been developed for project implementation and operation with no significant gaps.*

The project documentation contains or is on track to contain, when Environmental Management, Protection and Monitoring Plans are finalised, a range of mitigation and enhancement measures addressing all biodiversity-relevant VECs. Which of the proposed (or possibly, additional) measures that will be implemented will, in some cases, depend on the regulatory review and on monitoring and adaptive management systems. Key measures currently proposed include: for ecosystem diversity, intactness, wetlands functions, and priority plants - detailed surveys to avoid and minimise impacts on sensitive vegetation during construction, revegetation, blockage of access trails, prevention of impacts on and development of new marshes; for fish - restrictions on construction (for example, during spawning seasons), creation of spawning habitats, connections between shallow areas to avoid trapping, provisions for up- and downstream passage, and in the case of Lake Sturgeon, stocking, awareness creation and support to regional management efforts; for birds – establishment of vegetation buffers, restrictions on construction (for example, during breeding seasons), establishment of wetlands, preservation and creation of nests and breeding habitats, restrictions on access and harvesting of waterfowl; for mammals – restrictions on construction (for example, during Caribou calving season) and avoidance of calving habitats, establishment of wetlands for Moose and vegetation buffers around water bodies for Beavers, prohibition on firearms in work camps, signage, measures to deter Caribou and Moose from roads, rehabilitation of vegetation, and support to regional management efforts for Caribou and Beaver.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities; and commitments in plans are public, formal and legally enforceable.*

Many natural processes are inherently difficult to predict; for example, Caribou presence depends on multiple factors including migration patterns and population cycles, some of which are outside the influence of the project. Extensive monitoring programmes during construction and operation are therefore part of the Environmental Protection Program, with the involvement of public authorities, MH staff and contractors, and representatives of local communities. These are designed to detect and to be able to respond to emerging issues. A Monitoring Advisory Committee as well as the Partnership Board of Directors and regulators will supervise the Environmental Protection Program.

The Environmental Management, Protection and Monitoring Plans become binding once they are approved by licensing authorities. Licenses with their conditions, and most plans and monitoring reports are public documents.

While some fish stocks may increase, access problems and elevated mercury levels may render the fish less suitable for consumption. Commitments are in place under the Adverse Effects Agreements (AEAs) to provide alternative access to fish (and other country foods), with transportation being provided to fishing sites away from the Nelson River.

Given the range of issues to be considered during preparation and approvals, and supervised and enforced during implementation, for multiple projects in the north-eastern region of Manitoba, provincial authorities

such as Manitoba Conservation & Water Stewardship may lack sufficient staffing levels, which would increase dependence on self-regulation by MH and the Partnership.

Criteria met: Yes

## 19.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans avoid, minimise, mitigate, and compensate negative biodiversity impacts arising from project activities with no significant gaps.*

Early in the planning and assessment process, steps were taken to avoid impacts by reducing the size and adjusting the location of the project. Biodiversity considerations influenced the alignment of access roads and transmission lines, the choice of borrow and spoil areas, and other design parameters. Mitigation and/or enhancement measures were designed for all VECs, and residual effects were evaluated: for ecosystem diversity, intactness, wetlands functions, and priority plants, impacts are expected to be adverse but small and regionally acceptable; for fish, during construction populations are expected to either decrease temporarily or to remain stable, and to remain at historic levels, or increase, during operation; for birds, effects are expected to be adverse but small and regionally acceptable (for Bald Eagles, neutral during operation); for mammals, effects are expected to be adverse but small and regionally acceptable (Beavers cannot use the Nelson River as habitat, with or without the project, and Caribou and Moose are expected to lose less than 1% of their habitat in the study area).

Addressing the VECs will also provide functional habitats for other species. With mitigation, the project is not expected to substantially affect the rate at which invasive species are introduced and spread.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans avoid, minimise, mitigate and compensate negative biodiversity impacts due to project activities with no identified gaps; and plans provide for enhancements to pre-project biodiversity conditions or contribute to addressing biodiversity issues beyond those impacts caused by the project.*

Biodiversity in the project area has been comprehensively addressed. No critical habitat for endangered species is likely to be affected. The replacement of some habitat types which are not rare, by other habitat types, and small adverse effects on a number of terrestrial habitats and species, are deemed acceptable. Positive effects on at least one key species that is being considered for listing as at risk, the Lake Sturgeon, are expected.

Criteria met: Yes

## 19.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 19.3 Scoring Summary

MH and the KCN have comprehensively assessed and are planning to manage biodiversity impacts of the Keeyask project, including associated project components, in a responsible manner. The KCN are concerned that wildlife and fish populations of high importance for their culture and livelihoods may be locally diminished, adding to the historical reductions that they have experienced, partly as a result of past hydropower development.

In terms of biodiversity there is, however, an expectation and commitment to maintaining viable populations of all identified species in the project area. Beyond the impacts on species, shifts in ecosystem diversity are small against the background of a very large forest and freshwater mosaic in the northern boreal region.

There are no significant gaps against proven best practice, resulting in a score of 5.

**Topic Score: 5**

## 19.4 Relevant Evidence

<b>Interview:</b>	12, 31, 40, 43, 65
<b>Document:</b>	2, 9, 25, 30, 33, 36, 57, 58, 59, 66, 70, 133, 143, 144, 145, 167, 178, 179, 181
<b>Photo:</b>	None

## 20 Erosion and Sedimentation (P-20)

This topic addresses the management of erosion and sedimentation issues associated with the project. The intent is that erosion and sedimentation caused by the project is managed responsibly and does not present problems with respect to other social, environmental and economic objectives, and that external erosion or sedimentation occurrences which may have impacts on the project are recognised and managed.

### 20.1 Background Information

The reservoir created by the Keeyask project will flood 45 km<sup>2</sup> of land and 48 km<sup>2</sup> of existing waterways. A large proportion of the flooded land is peatland that will rapidly disintegrate following impoundment. In some areas, the peatland disintegration will reveal an underlying mineral shoreline that will also be affected by erosion. The reservoir will expand as the peatland and mineral shoreline erode.

The changes to the water regime caused by the project, and the associated changes in the erosion regime, will affect sedimentation processes. Upstream hydropower developments including the Lake Winnipeg Regulation (LWR) and the Churchill River Diversion (CRD) strongly influence the current sediment regime at Keeyask. However, in general the sediment concentration in the upstream reach is low, under a variety of flow conditions.

Erosion and Sedimentation is a key water-quality issue, but is addressed here, rather than in P-21.

### 20.2 Detailed Topic Evaluation

#### 20.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An erosion and sedimentation issues assessment has been undertaken with no significant gaps; the assessment identifies impacts that may be caused by the project, issues that may impact on the project, and establishes an understanding of the sediment load and dynamics for the affected river system.*

The EIS comprehensively assesses erosion issues created by the construction process and project operation by documenting, mapping and classifying the 205 kilometres of the existing Nelson River shoreline that the project is likely to affect as well as the 264 km of shoreline that will be present in the Keeyask reservoir. The mineral and organic erosion processes that may occur at the project site were assessed using computer and numerical modelling (models were calibrated using data from Stephens Lake, which serves as a proxy for the future Keeyask reservoir) and other similar reservoirs in northern Manitoba using aerial photography, field data and borehole investigations. MH also used a GIS-based wave model to predict the shoreline recession rate in mineral soils. The predicted shoreline erosion volumes were then used to estimate the rate of shoreline recession and its changing profile. Estimates of peatland disintegration and shoreline erosion caused by project operation were made for Years 1, 2-5, 6-15, 16-30, 31-51 and 51-100 after impoundment, and compared to the predicted erosion in a scenario without the project.

The Socio Economic Supporting Volume of the EIS assesses the impact of erosion and sedimentation on the KCN's access, navigation, traditional campsites and drinking water. It is noted that all communities in the area live outside of the project's open-water hydraulic zone of influence, so drinking water supplies will not be affected. The impacts of erosion and sedimentation are documented in the EIS and supporting volumes, including the use of aboriginal traditional knowledge (ATK), see P-19 for more details).

The EIS assesses erosion and sediment issues that may affect the project. The volume of sediment that will pass through the generating stations turbines is relatively low, and its composition fine. As such, sediment is not expected to have any impact on turbine operations or longevity. Equally, the low volume of sediment

deposition is not predicted to significantly affect the lifetime of the reservoir. MH expects an average of approximately 1 cm of sediment deposition each year during operation.

The EIS establishes an understanding of the sediment load and dynamics for the affected river system and the assessment includes consideration of suspended sediment concentrations, bedload transport, peat transport, organic suspended solids, river and lake-bed substrates, and an estimate of the sediment budget. Quantitative predictions of sediment load are made for the future environment with and without the project for implementation and operation. Two-dimensional modelling was undertaken using the Mike 21 software to assess the local mineral sediment environment. Hydraulic and sedimentation modelling of existing project environment was carried out to estimate the impact of cofferdam construction and potential changes to sediment concentration. A one dimensional HEC-6 model was used to assess the sediment changes in Stephens Lake. The EIS includes an assessment of the transport and deposition of peat and organic suspended solids, undertaken using GIS tools and numerical models, based on wind and post-project flow conditions. The study includes base maps of the post project environment based on water depth, shoreline and water surface information. The Aquatic Environment Supporting Volume of the EIS assesses the impact of changes in sedimentation to the watercourse due to the construction of the South Access Road, transmission line, campsite, work areas and other cleared lands. The document also considers the impact of inundation of excavated materials on TSS in the watercourse.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

MH has taken a broad approach to the assessment of erosion and sedimentation. The EIS draws on a large range of data including historical water level data, soil profile, stratigraphy, stereo photos, digital elevation models, meteorological data, field observations, video, and published literature. Cumulative impacts with future projects like Bipole III transmission, the Keeyask Transmission Project (KTP), and Conawapa have been considered for both erosion and sedimentation.

The EIS assesses the influence of climate-change risks on shoreline erosion and sedimentation processes, concluding it to be small, as the majority of erosion will take place in the first five years. The erosion and sedimentation study was third-party peer-reviewed, and MH-external experts reviewed the models and parameters employed to check that the process was reasonable, defensible and repeatable. The findings of this process were fed into continued analysis. Another risk assessed is that posed by erosion and sedimentation processes to navigation and waterways.

Opportunities assessed are: consideration of the KCN perspective on erosion and sedimentation issues; open sharing of peatland-disintegration modelling for northern Manitoba (which has not been undertaken before) for public use supported by the province-wide CAMP (Coordinated Aquatic Monitoring Program) database; and an assessment of the costs and benefits of removing the peat that will be inundated, for potential use as an energy source, or to remediate land. This study concluded that such utilisation would be prohibitively expensive.

MH also undertook an assessment of shoreline erosion and sedimentation processes at York Landing on Split Lake, which is outside of the open-water hydraulic zone of influence of the Keeyask project, at the request of YFFN.

Criteria met: Yes

### Analysis against basic good practice

**Scoring statement:** *Plans and processes to address identified erosion and sedimentation issues have been developed for project implementation and operation with no significant gaps.*

MH has developed an Instream Construction Sediment Management Plan to minimise the impact of in-stream sediment from construction activities. It sets out management measures for sediment that may enter the river via shore-line erosion, in-stream construction, river management and spillway and powerhouse commissioning. In addition, separate environmental protection plans exist to manage potential impacts from the construction of the generating station, the South Access Road and the Keeyask Infrastructure Project (KIP). Primary mitigation measures include directing river flow away from in-stream construction, minimising cofferdam erosion through careful design, reducing flow velocities across cofferdams using deflector groins, and working in the dry, where possible. Sediment and erosion control measures like vegetative buffer zones will be in place to reduce the sediment content in the construction-site runoff. Water will not be discharged from settling ponds or areas to be dewatered (e.g. from within cofferdams) unless suspended sediment concentrations are less than specified in requirements. Rehabilitation of disturbed land will begin towards the end of the construction period, this is discussed in P6.

MH is developing an Environmental Protection Program to mitigate, manage and monitor the environmental effects described in the EIS, for the operation phase. This programme includes environmental protection, management and monitoring plans, discussed in detail in P-5. The programme will cover erosion control from the shoreline, roads, stream crossings, earth dams and dykes, will guide compliance with relevant legislation. Specific erosion and sedimentation mitigation measures for the project's aquatic habitat during the operation phase are discussed in P-19.

Floating peat may pose a hazard to navigation, this will be mitigated by the Waterways Management Program, discussed in more detail in P-22.

The Water Power Act licensing process addresses shoreline erosion, in part, by the creation of a severance line for land upstream of the Keeyask dam. Inside the severance line, permission is required from both the Province and MH before a third party can build a structure like a dock, cabin, or boathouse. This reduces the risk for future property damage as a result of the project's operation.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities.*

Processes in place to anticipate and respond to emerging risks and opportunities are the Monitoring Advisory Committee (MAC), Physical Environment Monitoring Plan, the Aquatic Effects Monitoring Plan, and the Instream Construction Sediment Management Plan, which includes a plan for managing sediment during spillway and powerhouse commissioning.

The Instream Construction Sediment Management Plan includes a detailed in-stream real-time monitoring programme. If recommended TSS concentrations in the river are exceeded, a dedicated site environmental officer will respond with an Adaptive Action Plan. The plan could lead to the temporary suspension of work, modification of activities or installation of erosion or sedimentation control measures.

The Spillway and Powerhouse Commissioning Plan is in place to address the risk of excess sediment that could result from the first passage of water through the powerhouse, intake channel, tailrace channel and spillway.

The Aquatic Effects Monitoring Plan and Physical Environment Monitoring Plan make provision for the adaptive monitoring of erosion and sedimentation during the project's operating phase. Parameters measured will



include TSS, turbidity, mineral and organic shoreline erosion, and sediment deposition. The MAC will deal with any unforeseen erosion and sedimentation issues highlighted by the monitoring. This committee will meet every two months through construction and at a frequency to be determined during operation. The MAC will include both MH and KCN representatives.

Criteria met: Yes

## 20.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans avoid, minimise and mitigate erosion and sedimentation issues arising from project activities and erosion and sedimentation issues that may impact on the project with no significant gaps.*

Plans will avoid, minimise or mitigate all significant issues as required to keep suspended sediment content within applicable requirements. The Instream Construction Sediment Management Plan sets out how issues caused by erosion in construction will be avoided, minimised and mitigated. The key construction erosion issue highlighted is the river diversion caused by the cofferdams, which will increase erosion on the south shore of the south channel of Gull Rapids.

During construction, the EIS predicts that mineral suspended sediment concentration will increase in Gull Rapids and the inflow into Stephens Lake. The prediction is that the river will deposit around 30% of the increased sediment load in Stephens Lake, and the rest will be transported downstream of the Kettle GS. The sediment management plan will trigger corrective action if suspended solids increase beyond threshold levels. The EIS predicts that construction activities will deposit 0.1-0.6 cm sediment on the bottom of Stephens Lake within 4-6 km of Gull Rapids, but that the deposition will not change the composition of the lake's substrate.

During operation, there are a number of erosion and sediment impacts that MH do not intend to mitigate, but these are not considered significant. Shoreline erosion is predicted to increase the reservoir area by 7-8 km<sup>2</sup> over the first 30 years of operation, due to peatland disintegration and bank erosion in mineral soil.

The KCN remain concerned that shoreline erosion will increase sediment in the water and cause an unsightly new shoreline susceptible to slumping. This will be resolved through the monitoring programme.

Sediment load into the project area from Split Lake is not expected to change during operation. Mineral suspended solids between Birthday Rapids and Keeyask GS (in the new reservoir) are predicted to be reduced compared to the present conditions, due to lower water velocities. The EIS predicts the majority of sediment deposition to be in the near-shore areas at a rate of between 0 and 3 cm per year after year one, and mineral suspended solids downstream of Keeyask are expected to decrease. Although a large amount of organic sediment will initially be released by the peatland disintegration, the amount of organic suspended solids in the reservoir are expected to be reduce to low levels in subsequent years.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans avoid, minimise, mitigate and compensate erosion and sedimentation issues due to project activities with no identified gaps; and plans provide for enhancements to pre-project erosion and sedimentation conditions or contribute to addressing erosion and sedimentation issues beyond those impacts caused by the project.*

Compensation to replace fish habitat lost due to the erosion and sedimentation caused by the project is addressed in P-19. Contingency plans are in place to address potential changes in the substrate available for fish habitat. The assessment of other residual impacts (e.g. disintegration of peatland) show that these would not require compensation to meet proven best practice.

The project development will enhance the current erosion and sedimentation conditions by preventing the formation of an ice dam below Gull Rapids, which is currently responsible for considerable bank erosion on Stephens Lake. This will also reduce the risk to the cabins situated on the lake shore.

Criteria met: Yes

## 20.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 20.3 Scoring Summary

Erosion and sedimentation issues have been comprehensively assessed in the EIS, with broad consideration given to both impacts caused by the project and issues that may affect it through the use of a wide range of input data, and innovative computer modelling. Plans such as the Instream Construction Sediment Management Plan and the Aquatic Effects Monitoring Plan are in place to address identified erosion and sedimentation issues through construction and operation and to respond to emerging risks and opportunities. If implemented fully, these plans should avoid, minimise, mitigate and compensate erosion and sedimentation issues arising as a result of the project. The project will enhance existing erosion and sedimentation conditions by eliminating the formation of an ice dam at Gull Rapids. There are no significant gaps against proven best practice, resulting in a score of 5.

Topic Score: 5

## 20.4 Relevant Evidence

<b>Interview:</b>	1, 3, 8, 20, 42
<b>Document:</b>	3, 16, 47, 57, 58, 62, 63, 65, 75, 143, 145
<b>Photo:</b>	None

## 21 Water Quality (P-21)

This topic addresses the management of water quality issues associated with the project. The intent is that water quality in the vicinity of the project is not adversely impacted by project activities.

### 21.1 Background Information

Water quality is one the five valued environmental components used to assess the project's impact on aquatic habitat in the EIS.

Some areas of interest that relate to water quality are addressed separately in specific topics, so will not be addressed here. These are erosion and sedimentation, which is addressed in topic P-20, methyl-mercury and waste-water relevant to public health, which are addressed in topic P-18 and the impact of water quality on aquatic life, which is addressed in P-19.

### 21.2 Detailed Topic Evaluation

#### 21.2.1 Assessment

##### **Analysis against basic good practice**

**Scoring statement:** *A water quality issues assessment has been undertaken with no significant gaps.*

The EIS contains a water-quality assessment which has been undertaken in a systematic way, based on data analysis, computer models, scientific literature, and predictions based on information from a proxy reservoir (Stephens lake). The assessment covers reservoir water quality, downstream changes and construction impacts through the implementation and operation phases of the project. The assessment covers the affected project area, extending up to Split Lake, and down to Kettle GS. A pre-project baseline is established for pre-1997 conditions and for current conditions.

Characterisation of the impact on water quality is based on a comparison between the predicted change and existing water quality, and against the standards set by the Manitoba Water Quality Standards, Objectives and Guidelines and the CCME guidelines for the protection of aquatic life.

Water temperature and dissolved oxygen (DO) content is assessed across the project area and through a range of conditions. Existing water temperature monitoring data was assessed, taken from upstream and downstream of Gull Rapids. Modelling was used to simulate conditions for different weekly periods with different inflows, temperatures and wind speeds for year one and five of the operation. The analysis considered both the open-water and the ice-covered periods.

Criteria met: Yes

##### **Analysis against proven best practice**

**Scoring statement:** *In addition, the assessment takes broad considerations into account, and both risks and opportunities.*

A large number of water-quality studies have been undertaken over a 10-year period. The collection of data was spatially broad, and went beyond the open-water hydraulic zone of influence of the project. Comprehensive assessment was done for water temperature, dissolved oxygen, total dissolved gases, pH, total suspended solids/turbidity, organic carbon, true colour, water clarity, nitrogen and phosphorous and metals. The impact of climate change on the water-quality study was also assessed (concluding that the findings are not sensitive to climate change).

The EIS includes a study of the cumulative impacts for water quality. The overlap with the existing generating stations on the Nelson and Burntwood rivers is identified, as is the effect of the Churchill River Diversion, Lake Winnipeg Regulation and potential future overlaps with Conawapa. The inter-relationships between water quality and other project-related issues are discussed in the socio-economic and aquatic environment sections of the EIS.

The inclusion of the KCN assessments of water-quality issues from their own perspective using Aboriginal Traditional Knowledge (ATK) is considered a further broad consideration. As are studies of the water quality at York Landing on Split Lake, which were undertaken following concerns of the community about the effect of the project on drinking-water supply. This has served to improve the understanding of the drinking water resource at that location.

The EIS assesses of the risks the project might cause, such as the entrapment of fish in low DO areas and the shallow nature of the groundwater table, increasing risk of contamination from construction activities.

The baseline study does not identify any significant water-quality issues, so the EIS does not suggest any mitigation to improve water quality.

Criteria met: Yes

## 21.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Plans and processes to address identified water quality issues have been developed for project implementation and operation with no significant gaps.*

The EIS predicts that there will be no significant water-quality impacts through the construction or operation of the project, except for sediment-related issues that are addressed in P-20. Nonetheless, a number of environmental protection, management and monitoring plans, for construction and operation have been developed in draft form (see P-5 and P-20). Monitoring is planned to measure the effect of the project on total dissolved gas pressure downstream of the generating station. Results could be used to provide information on how spillway operation might be adapted to minimise these downstream impacts.

When operating, Keeyask will use the ISO 14001-certified EMS, which is employed by all of MH's generating stations. This covers waste-water treatment and monitoring, storage and handling of petroleum products, water-quality monitoring of the station sump, and storage, use and disposal of hazardous materials. During the project's operation phase, a waste-water treatment plant will be installed to process waste-water generated in the powerhouse. Effluent will be discharged to the Nelson River and will meet Manitoba conservations Tier 1 water quality standard for municipal wastewater effluent discharged to a water body. Waste-water issues relevant to public health are dealt with under P-18.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities.*

The project will employ an adaptive management process to respond to uncertain and unexpected project effects. The basis of this is an extensive monitoring programme which will provide data that will help determine if additional mitigation and compensation measures are required; or if no additional measures are possible, potential compensation and lessons learned for future projects. The EMS will also enable the project to respond to emerging risks. The risk to fish getting caught in low-DO back bays during winter will be mitigated by excavating deep channels, between the affected area and the main water body, which will not freeze, thus allowing fish to escape.

The Aquatic Effects Monitoring Plan addresses water quality and the aquatic habitat. It outlines core and specific monitoring plans for the construction and operation phases of the project. The plan is designed to be adaptive and its results will be used to modify the monitoring programmes and mitigation measures. Monitoring may continue for 30 years into operation, although the programme may be curtailed if no impacts are observed. The Aquatic Effects Monitoring Plan will be reviewed by Environment Canada, Manitoba Conservation and Water Stewardship (MCWS) and Fisheries and Oceans Canada (DFO), who may identify additional monitoring activities to be included. A Monitoring Advisory Committee will meet on a bi-monthly basis and will deal with water-quality issues identified as a result of the ongoing monitoring.

Community-specific monitoring will be undertaken based on Cree perspectives and understanding of potential project effects. This will take place at key milestones through the project's construction and operation.

Criteria met: Yes

## 21.2.3 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans avoid, minimise and mitigate negative water quality impacts arising from project activities with no significant gaps.*

The project is predicted to affect water quality through a number of pathways in both the construction and operation phases. During construction, key pathways are placement and removal of cofferdams, runoff from construction sites, blasting, accidental spills, and road construction. During operation, key pathways are changes in the water and ice regimes, flooding of terrestrial habitat, erosion, and sediment transport and deposition.

Plans will avoid, minimise or mitigate all impacts with no significant gaps. The project explicitly sets out to prevent adverse effects, mitigate unavoidable adverse effects or provide appropriate compensations.

During construction, the EIS predicts the largest impact on water quality will be an increase in sediment load; this issue is addressed in P-20. Little effect is predicted for water temperature or dissolved oxygen in the river at this stage, due to the high levels of mixing upstream of the project. Water-quality risks and mitigation measures for the construction phase are set out in detail in the EIS and environmental protection plans. Activities, their impacts and mitigation measures are explained. Residual effects of construction activities on water quality are expected to be in-significant due to mitigation measures planned. Reservoir clearing will take place during construction to reduce debris in the waterway, this is discussed in more detail in P-22.

Through the operation phase, water temperature and dissolved oxygen in the majority of the reservoir is expected to be within the criteria limits for protection of aquatic life. Some stratification and increased surface water temperature is likely in shallow back bays for short periods of time, and low dissolved oxygen is expected in the back bay areas in winter and under infrequent low-wind periods in summer. No major changes in water temperature or dissolved oxygen is expected downstream of the project. It is expected that the water in the flooded area during operation will experience a slight increase in sediment, nutrients and metals. The EIS predicts that the project will not affect groundwater quality.

Specific mitigation measures for surface-water temperature and dissolved oxygen have not been identified since the impacts on the aquatic environment are not assessed as significant. Low dissolved oxygen in back bays is a risk for fish but in most cases fish will be able to move away from these areas. The exception is Little Gull Lake, which will be flooded by the reservoir and would be susceptible to low DO since it could be cut off during the winter as the shallow channels that link it to the main body of water will freeze. As stated above, this will be mitigated by excavating escape channels that are deep enough that they will not freeze.

Water quality impacts on fish and concomitant mitigation measures are addressed in P-19.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans avoid, minimise, mitigate and compensate negative water quality impacts with no identified gaps; and plans provide for enhancements to pre-project water quality conditions or contribute to addressing water quality issues beyond those impacts caused by the project.*

Plans will avoid, minimise or mitigate all significant impacts without gaps. Residual impacts (e.g. seasonal, localised changes in DO and temperature) are not considered significant, and would not require compensation to meet proven best practice. However, in accordance with the precautionary approach adopted in co-operation with the KCN, and responding to potential regulatory requirements, these parameters will be monitored.

The ATK-based assessment predicts changes to water level and flow causing water-quality changes in Split Lake and Clark Lake, upstream of Birthday Rapids. Technical studies exclude this through careful hydraulic analyses and planning, but monitoring will be carried out during operation to address KCN concerns.

In terms of enhancements, the pre-project baseline does not identify any significant water-quality issues that could be addressed by the project through remediation measures. The project area is sparsely populated and there are no major human-related discharges that the project can address. The project has contributed to addressing water quality beyond its own impacts through the monitoring programme, which has contributed to an improved understanding of the water quality in the river.

Criteria met: Yes

## 21.2.4 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice

0 significant gaps

## 21.3 Scoring Summary

A water quality assessment has been undertaken as part of the EIS process. It takes broad considerations, including sampling a wide range of water-quality parameters, assessment of cumulative impacts and the inter-relationship amongst issues. Risks, such as the entrapment of fish in low-DO areas are assessed and mitigation is identified. Given the absence of current significant water-quality issues, no opportunities for improvement are identified. There are plans and processes in place to address identified water-quality issues for project construction, such as the Generating Station Environmental Protection Plan, and emerging issues through operation, such as the Aquatic Effects Monitoring Plan. If implemented fully, plans will avoid, minimise, mitigate and compensate water-quality impacts arising from the project. The EIS does not identify opportunities to enhance pre-project water conditions, but the project has contributed to addressing water quality beyond its own impacts through the monitoring programme which has contributed to an improved understanding of the water quality in the river.

There are no significant gaps against proven best practice, resulting in a score of 5.

Topic Score: 5

## 21.4 Relevant Evidence

<b>Interview:</b>	1, 3, 20, 36
<b>Document:</b>	4, 9, 15, 57, 58, 62, 65, 75, 125, 143
<b>Photo:</b>	None

## 22 Reservoir Planning (P-22)

This topic addresses the planning for management of environmental, social and economic issues within the reservoir area during project implementation and operation. The intent is that the reservoir will be well managed taking into account power generation operations, environmental and social management requirements, and multi-purpose uses where relevant.

### 22.1 Background Information

The reservoir of the Keeyask project will have an initial surface area of approximately 93 km<sup>2</sup>, expanding over time by about 7-8 km<sup>2</sup> during the initial 30 years of operations. The project will utilise approximately 18 m of the 27 m of hydraulic head available between Split Lake and Stephens Lake; about 12 m of this drop occurs through Gull Rapids, the site for the Keeyask dam. The 2000 Agreement In Principal (AIP) between Manitoba Hydro (MH) and Tataskweyak Cree Nation (TCN) included, at TCN's insistence, the sentence that "The forebay will be cleared". This was a first for Manitoba. The AIP also set out, in general terms, the size of the reservoir.

Discontinuous earth-fill dykes will be located along both sides of the river, to contain the reservoir and to limit flooding of the surrounding landscape. A roadway will be constructed on top of the dykes and on high ground between the sections of the dykes to facilitate inspection and maintenance. Including roadway sections, these earth dykes will extend 11.6 km on the northern side, and 11.2 km on the south side of the river/reservoir.

Analyses specifically dealing with detailed issues concerning heritage resources, public health, wildlife, erosion and sedimentation, water quality, and downstream flows are addressed under topics P-17, P-18, P-19, P-20, P-21 and P-23 respectively. Considerations relating to choice of site and design are assessed under topic P-4.

### 22.2 Detailed Topic Evaluation

#### 22.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment has been undertaken of the important considerations prior to and during reservoir filling and during reservoir operations, with no significant gaps.*

Important considerations prior to and during reservoir filling are assessed and documented in the Joint Keeyask Development Agreement (JKDA) schedules 7-1, 11-1 and 11-2, and in the Environmental Impact Statement (EIS) for the Keeyask Generation Project. Three design alternatives were assessed concerning the extent of the flooded area, and a low-level reservoir option was selected to avoid impacts on both Split Lake and Clark Lake, and reduce impacts at Birthday Rapids. The project will operate with a Full Supply Level (FSL) of 159 m.a.s.l. and a Minimum Operating Level (MOL) of 158 m.a.s.l. The spillway is designed to accommodate a flow of 9 960 m<sup>3</sup>/s at the project's normal FSL of 159 m. The Probable Maximum Flood (PMF) for Keeyask is calculated as more than twice the record flood from 2005 (the highest recorded daily average flow). Based on a preliminary schedule, the filling is planned to start in August 2019 and to be completed by October 2019, in ice-free conditions. The rate of filling will be limited to a maximum of 0.5 to 1.0 m per day.

The assessment covers all other important aspects, e.g. (but not limited to): current and future water profiles, velocities, hydraulics, open-water conditions, winter conditions, bathymetry, and vegetation within future inundated areas; to fish habitat; waterways public safety, including navigation hazards and ice layers conditions and boat access and relocation of boat launches and landing sites; and Identification of burial sites and heritage resources within the reservoir area (see P-17 for more details).

The project reservoir's surface area will initially be approximately 93 km<sup>2</sup> of which 48 km<sup>2</sup> are existing waterways and the remaining 45 km<sup>2</sup> will consist of newly inundated areas. The reservoir is predicted to



expand by 7 to 8 km<sup>2</sup> over the first 30 years of project operation due to shoreline erosion and peatland disintegration. Other issues were considered in the assessment of reservoir operations including monitoring of areas suffering future peatland disintegration to identify potential uncovered heritage resources, and mitigation for the loss of habitats. The project will operate within a 1 m range in either base-load or peaking mode, depending on power demand. Water levels in the reservoir may be stable but may fluctuate up to 1 m on a weekly or daily basis.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment is based on dialogue with local community representatives, and takes broad considerations, risks and opportunities into account.*

The preparation of the EIS and the JKDA have involved extensive public consultations and negotiations processes with Keeyask Cree Nations (KCN) (see P-1 and P-5). Certain fundamental features of the project such as operating levels of the reservoir were established in the JKDA and cannot be altered without the consent of the KCN.

The reservoir-planning assessment takes broad considerations into account, exemplified by the assessment of Green-house Gases (GHG) emissions from the reservoir and assessment of climate change impacts based on Intergovernmental Panel on Climate Change (IPCC) guidance. MH have conducted field studies to measure pre-impoundment CO<sub>2</sub> and CH<sub>4</sub> concentrations in the reservoir, at both upstream and downstream locations, since 2008. The reservoir GHG-emissions assessment is also part of a project life-cycle GHG assessment that provides an emission-reduction statement for the project, see also P-7.

The selection of a low-head option is mainly based on KCN concerns; other aspects considered include: improvement of access and navigation routes safety, an assessment of salvaging cleared timber for firewood, saw-logs, etc., as well as an assessment of salvaging peatland that will be flooded.

The assessment of reservoir issues considers risks. Examples of this are: floating debris and navigation hazards; erosion and peatland disintegration and exposure or damage of buried human remains and heritage resources; loss of terrestrial habitat; public safety and reservoir-level fluctuations; burning of brush piles will be undertaken in the winter to avoid peat fire; and the rate of filling of the reservoir is limited out of concern for bank stability and monitoring considerations.

The reservoir planning assessment also takes opportunities into account. The GHG research undertaken is an opportunity to continue research and development on climate change and to share knowledge with other projects in and out of MH.

Criteria met: Yes

## 22.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Plans and processes to manage reservoir preparation, filling and operations have been developed.*

Key plans and processes to manage reservoir preparation and filling are contained in the Reservoir Clearing Plan and the Waterways Management Program.

The Reservoir Clearing Plan contains measures to minimise impacts on fishery and impacts of vegetation on fishing, aesthetics and hazards to boat safety. Measures include clearing trees prior to impoundment in the area inundated and post-impoundment in areas affected by erosion or peatland disintegration. The plan indicates areas to be cleared together with timing and methods of clearing.

The Waterways Management Program aims to provide safe waterways during construction and operation. Measures are identified for the pre-impoundment and post-impoundment phases. Some examples are boat patrols for reservoir monitoring, marking of navigation hazards, provision of safe landing sites, development of depth charts and monitoring of floating debris.

Other measures and processes proposed for the preparation and filling periods include: removal of the ice boom prior to impoundment; undertake cultural ceremonies for significant activities e.g. loss of Gull rapids due to impoundment; and mitigate for the loss of habitats by habitat recovery and creation of fish spawning habitats (see P-19).

A number of additional environmental protection and monitoring plans for the construction and operation phases, relating to reservoir-issues management are in the process of development, e.g.: Environmental Protection Plans; Sediment Management Plan; Vegetation Rehabilitation Plan; Terrestrial Mitigation Implementation Plan; Fish Habitat Compensation Plan; Access Management Plans; Physical Environment Monitoring Program (e.g. water levels, ice processes and conditions); a Heritage Resources Protection Plan (HRPP); and Water Management Program; to name a few. The Assessment Team had access to draft plans and were advised that they will be finalised prior to the start of construction.

The Adverse Effects Agreements (AEAs) also contain provisions for developing mitigation programmes to compensate for impacts of resource use and traditional fishing practices e.g. the Fish Stocking Program.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, reservoir plans are based on dialogue with local community and government representatives; and processes are in place to anticipate and respond to emerging risks and opportunities.*

The following plans were developed in direct response to community concerns: the Reservoir Clearing Plan, the Waterways Management Program, location of safe landing sites, reservoir depth charts and travel routes, and the Ice Monitoring and Safe Trails Program. This is documented in the JKDA, KCN environmental assessments and the EIS. In addition, the AEA's mitigation programmes have been negotiated with KCN, and the environmental and monitoring protection plans are developed with the KCN, incorporating Aboriginal Traditional Knowledge (ATK) and the Cree worldview.

The EIS is going through a regulatory process and it will have to be reviewed by the Provincial and Federal Government. The plans are subject to the provisions of any license and conditions issued by a regulatory authority to ensure compliance with relevant legislation: Section 35; Fisheries Act; Navigable Waters Protection Act; Heritage Resources Act; and Water Power Act. As an example, the HRPP has been developed in dialogue with the provincial government heritage-resources representative.

Processes to anticipate and respond to risks and opportunities include: bi-monthly meetings on site of the Monitoring Advisory Committee (formed by MH and KCN representatives) to share monitoring information and address potential emerging issues during construction and operation; adaptive management plans updated according to monitoring results; and continuous reporting and liaisons with regulators.

Criteria met: Yes

## 22.2.3 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

## Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 22.3 Scoring Summary

The project reservoir's surface area will initially be approximately 93 km<sup>2</sup>, 48 km<sup>2</sup> of existing waterways and 45 km<sup>2</sup> of newly inundated areas. The reservoir is predicted to expand by 7 to 8 km<sup>2</sup> over the first 30 years of project operation due to shoreline erosion and peatland disintegration. The project will operate within a very narrow 1-metre band with an FSL of 159 m and an MOL of 158 m in response to community concerns. Assessment of potential issues related to reservoir planning are documented in the EIS, technical studies, supporting volumes and the JKDA.

The assessment and management measures consider issues prior to, during and after filling of the reservoir with no significant gaps. Management plans have been prepared or are on track to be prepared addressing key issues, and are developed in close co-operation with local communities through the KCN committees and regulatory licensing process. A number of processes to anticipate and respond to emerging risks and opportunities have been developed jointly with the KCN.

There are no significant gaps at the level of proven best practice, resulting in a score of 5.

Topic Score: 5

## 22.4 Relevant Evidence

<b>Interview:</b>	24, 27
<b>Document:</b>	27, 47, 48, 57, 62, 63, 64, 70, 75, 76, 91, 94, 126, 143, 144, 145
<b>Photo:</b>	1, 2, 14, 15, 16 and 17

## 23 Downstream Flow Regimes (P-23)

This topic addresses the flow regimes downstream of hydropower project infrastructure in relation to environmental, social and economic impacts and benefits. The intent is that flow regimes downstream of hydropower project infrastructure are planned and delivered with an awareness of and measures incorporated to address environmental, social and economic objectives affected by those flows.

### 23.1 Background Information

The Keeyask hydropower plant will discharge straight into Stephens Lake, the existing reservoir for the downstream-located Kettle hydropower plant. Kettle is operated such that the level of Stephens Lake, except for extreme cases, varies within approximately a 1-metre range in the short term, with an annual variation of less than 3 metres.

There are inter-relationships with topic P-19 where all aspects dealing with biodiversity impacts and conservation are dealt with, as well as P-22, dealing with the reservoir itself.

### 23.2 Detailed Topic Evaluation

#### 23.2.1 Assessment

##### Analysis against basic good practice

**Scoring statement:** *An assessment of flow regimes downstream of project infrastructure over all potentially affected river reaches, including identification of the flow ranges and variability to achieve different environmental, social and economic objectives, has been undertaken based on relevant scientific and other information with no significant gaps.*

The potential downstream impacts of the Keeyask station are clearly identified and will be limited to changed flow conditions in the immediate, approximately 5 km, downstream area of Stephens Lake.

Variation in flow releases through the Keeyask power station and dam will happen as a result of initial reservoir filling, as result of diurnal or weekly peaking utilising the 1-metre operating range available, and as a result of spilling in periods when the inflow is higher than the plant's discharge capacity.

The initial reservoir filling is planned for late summer through autumn of 2019. The plan is to fill slowly, over some months. This means retaining 100-300 m<sup>3</sup>/s only in the reservoir and pass the rest of the flow downstream through the spillways. This would mean using in the order of 3-10% of the incoming flow, resulting in an outflow well within existing variations.

The active volume of the reservoir will initially be 81 x 10<sup>6</sup> m<sup>3</sup>, expanding over time through erosion (see topics P-20 and P-22) to around 85 x 10<sup>6</sup> m<sup>3</sup>. This represents around 6-7 hours' design flow for the 7 turbines at Keeyask (550 m<sup>3</sup>/s each of design discharge).

A potential positive impact of the project is the avoidance of the ice-dam formation now occurring (photo 1) at the foot of Gull Rapids every winter, affecting water levels at the base of the rapids by up to 7-8 metres. With Keeyask, a smoother, thinner ice cover will form downstream, and water-level increases associated with the ice dam will not occur.

Detailed studies of the impact on fish and other species have been undertaken as part of the EIA work. Much of the mitigation surrounding the flow releases from the Keeyask power plant deal with habitat aspects. See topics P-5 and P-19 for more details on this.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, the assessment is based on field studies, and takes broad considerations, risks and opportunities into account.*

The assessments take broad considerations through the combined use of the Keeyask Cree Nations' (KCN's) environmental assessments, in combination with extensive scientific field work.

The risks and opportunities in the immediate downstream area in relation to fish passage and the spawning and eggs/larvae survival for Lake Sturgeon and other fish species have been assessed in detail as part of the environmental assessments and are dealt with under topic P-19.

The opportunity of turning some of the dewatered area downstream of the south dam near the spillway into wetland or aquatic habitat has been identified and included in the mitigation planning as has the establishment of fish-spawning habitat downstream of the tailrace outlet.

Criteria met: Yes

## 23.2.2 Management

### Analysis against basic good practice

**Scoring statement:** *Plans and processes for delivery of downstream flow regimes have been developed that include the flow objectives; the magnitude, range and variability of the flow regimes; the locations at which flows will be verified; and ongoing monitoring; and where formal commitments have been made, these are publicly disclosed.*

The relevant management objective is to secure the spawning areas constructed downstream of the dam. During the spring spawning period for Lake Sturgeon, mid-May through June, a minimum of 2 units will always be in operation. If the station needs to spill at all in the early summer snow-melting period, continuous spill will be maintained through the spawning season, if required to in order to meet environmental objectives.

Flows will be verified through the turbines or at the spillway. The efficiency of the suggested mitigation measured will be monitored with attention on several different species, as well as on water quality.

The monitoring programme, the Joint Keeyask Development Agreement (JKDA) and the Adverse Effects Agreements (AEAs) are all publicly disclosed.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, processes are in place to anticipate and respond to emerging risks and opportunities; and commitments in plans are public, formal and legally enforceable.*

The AEAs, mitigation and compensation measures as well as monitoring plans, are designed for adaptive management. The legacy-based doubts on the part of the First Nations for the western-science approach to impact prediction, the assignation of significance of impacts and the identification of Valued Ecosystem Components have resulted in a strong and prudent emphasis on more-than-normally comprehensive monitoring and the agreement in writing that this will be revisited and redesigned if the results indicate a need for this.

As stated above under basic good practice, both the AEAs and the JKDA are formal public documents and are legally enforceable. Following the licensing process, the authorities will also likely issue legally binding license requirements.

The Technical Advisory Committee and Monitoring Advisory Committee will guarantee attention to emerging risks and opportunities.

## 23.2.3 Stakeholder Engagement

### Analysis against basic good practice

**Scoring statement:** *The assessment and planning process for downstream flow regimes has involved appropriately timed, and often two-way, engagement with directly affected stakeholders; ongoing processes are in place for stakeholders to raise issues with downstream flow regimes and get feedback.*

The comprehensive involvement of the KCN in the preparation of the EIS, the KCN's own environmental assessments and the extensive consultations have ensured appropriately-timed and two-way communication on key issues relevant to downstream flows. Issues and feedback will be managed through the future-development offices and the Monitoring Advisory Committee.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, engagement with directly affected stakeholders has been inclusive and participatory; and feedback on how issues raised have been taken into consideration has been thorough and timely.*

The process of the KCN's environmental assessments have been a tool for the directly-affected communities to engage in an inclusive and participatory manner with their own community members.

The specific issue of downstream flows has not been an issue of contention or debate (the attention is on fish and aquatic continuity, and these issues are dealt with under topic P-19). The attention to feedback and internalisation of issues raised throughout the planning process is described in detail under P-1.

Criteria met: Yes

## 23.2.4 Outcomes

### Analysis against basic good practice

**Scoring statement:** *Plans for downstream flows take into account environmental, social and economic objectives, and where relevant, agreed transboundary objectives.*

The planning for downstream flows and the dewatered areas downstream of the planned dam have only environmental objectives. Given the fact that there are no identified issues in the social or economic areas, this is a non-significant gap.

Criteria met: Yes

### Analysis against proven best practice

**Scoring statement:** *In addition, plans for downstream flow regimes represent an optimal fit amongst environmental, social and economic objectives.*

The creation and maintenance of fish habitat and the wetland areas are the only relevant priorities in relation to downstream flow and dewatered areas. The suggested mitigation plans can, therefore, be regarded as an optimal fit, as they address all identified objectives.

Criteria met: Yes

## 23.2.5 Evaluation of Significant Gaps

### Analysis of significant gaps against basic good practice

There are no significant gaps against basic good practice.

0 significant gaps

### Analysis of significant gaps against proven best practice

There are no significant gaps against proven best practice.

0 significant gaps

## 23.3 Scoring Summary

The affected downstream stretch of river is very short, as the plans are to release the tailwater straight into the existing hydropower reservoir of Stephens Lake.

The reservoir filling will be conducted slowly, using only 3-10% of normal inflow. Regulation during operation will be limited to the 1-metre operating range. The live storage volume of the reservoir will only represent hours of operation of the Keeyask Generating Station, running at full capacity.

Opportunities for habitat creation and enhancement have been taken through the creation of fish-spawning habitat, wetlands creation and a commitment to spill water through the spillway throughout the spawning season, if required to in order to meet environmental objectives.

The Technical Advisory Committee, the Monitoring Advisory Committee and the legally enforceable JKDA and AEA documents are appropriate management tools to address any emerging risks and opportunities. Stakeholder engagement has been thorough and the outcome can be considered an optimal fit due to the absence of social or economic priorities with downstream flow identification.

There are no significant gaps against proven best practice, resulting in a score of 5.

Topic Score: 5

## 23.4 Relevant Evidence

<b>Interview:</b>	7
<b>Document:</b>	1, 2, 3, 4, 9, 30, 47, 56, 57, 58, 62, 63, 64, 70, 144
<b>Photo:</b>	1

## Appendix A: Written Support of the Project Developer





## Appendix B: Verbal Evidence

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
1	<b>Loretta Ross</b> , Executive Director <b>Karen Anderson</b> , Director Operations <b>Leslie Agger</b> , Researcher	Fox Lake Cree Nation	Negotiations Office	4 December, 2012	Winnipeg	Bernt Rydgren
2	<b>Vicky Cole</b> , Manager <b>Mark Manzer</b> , Socio-Economic Assessment Supervisor	Manitoba Hydro	Major Projects Assessment/Licensing	4 December, 2012	Winnipeg	Aida Khalil
3	<b>Lorna Keeper</b> , Keeyask OWL Staff <b>Bryant Keeper</b> , Bipole III OWL Staff <b>Robert Flett</b> , Bipole III OWL Staff <b>Bill Kennedy</b> , Consultant	Tataskweyak Cree Nation Tataskweyak Cree Nation Tataskweyak Cree Nation EE Hobbs & Associates Ltd.		4 December, 2012	Winnipeg	Doug Smith
4	<b>Ed Wojczynski</b> , Division Manager <b>Ryan Kustra</b> , Manager <b>Brenda Froese</b> , Manager	Manitoba Hydro	Portfolio Projects Management Division Keeyask Regulatory & Licensing Major Project Partnership & Services	4 December, 2012	Winnipeg	Bernt Rydgren
5	<b>Betsy Kennedy</b> , Chief <b>Bill Kennedy</b> , Consultant	War Lake First Nation EE Hobbs & Associates Ltd.		4 December, 2012	Winnipeg	Joerg Hartmann
6	<b>Shawna Pachal</b> , Division Manager <b>Ryan Kustra</b> , Manager <b>Brenda Froese</b> , Manager	Manitoba Hydro	Power Projects Development Division Keeyask Regulatory & Licensing Major Project Partnership & Services	4 December, 2012	Winnipeg	Aida Khalil

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
7	<b>Marc St. Laurent,</b> Section Head - Keeyask/Burntwood River Planning <b>Jarrold Malenchak,</b> Section Head - Sediment & Ice Studies <b>Nick Barnes,</b> Sr Regulatory Achievement Advisor	Manitoba Hydro	Hydro Power Planning  Water Resources Engineering  Major Projects Assessment/Licensing	4 December, 2012	Winnipeg	Bernt Rydgren
8	<b>Ryan Kustra,</b> Manager <b>Marc St. Laurent,</b> Section Head - Keeyask/Burntwood River Planning <b>Nick Barnes,</b> Sr Regulatory Achievement Advisor	Manitoba Hydro	Keeyask Regulatory & Licensing  Hydro Power Planning  Major Projects Assessment/Licensing	5 December, 2012	Winnipeg	Bernt Rydgren
9	<b>Ralph Wittebolle,</b> Division Manager <b>Glen Schick,</b> Manager  <b>Bruce Evans,</b> Sr Labour Relations Officer <b>Don Rogalsky,</b> Labour Relations Advisor	Manitoba Hydro	New Generation Construction Division Keeyask Engineering & Construction Human Resources Division Major Projects	5 December, 2012	Winnipeg	Aida Khalil
10	<b>Ralph Wittebolle,</b> Division Manager <b>Halina Zbigniewicz,</b> Manager <b>Glen Schick,</b> Manage  <b>Dave Bowen,</b> Manager	Manitoba Hydro	New Generation Construction Division Hydro Power Planning  Keeyask Engineering & Construction Project Services	5 December, 2012	Winnipeg	Doug Smith

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
11	<b>Marc St. Laurent</b> , Section Head - Keeyask/Burntwood River Planning <b>Jarrold Malenchak</b> , Section Head - Sediment & Ice Studies <b>David Block</b> , Environmental Specialist	Manitoba Hydro	Hydro Power Planning  Water Resources Engineering  Licensing & Environmental Assessment	5 December, 2012	Winnipeg	Bernt Rydgren
12	<b>Shirley Fontaine</b> , Facilitator	Province of Manitoba – Aboriginal & Northern Affairs	Aboriginal Consultation Unit	5 December, 2012	Winnipeg	Joerg Hartmann
13	<b>Ed Wojczynski</b> , Division Manager  <b>Ryan Kustra</b> , Manager  <b>Vicky Cole</b> , Manager	Manitoba Hydro	Portfolio Projects Management Division Keeyask Regulatory & Licensing Major Projects Assessment/Licensing	5 December, 2012	Winnipeg	Doug Smith
14	<b>James Matthewson</b> , Sr Environmental Assessment Officer  <b>David Block</b> , Environmental Specialist  <b>Susan Collins</b> Sr Analyst	Manitoba Hydro	Licensing & Environmental Assessment  Licensing & Environmental Assessment  Policy & Strategic Initiatives	5 December, 2012	Winnipeg	Bernt Rydgren
15	<b>Ralph Wittebolle</b> , Division Manager  <b>Glen Schick</b> , Manager Keeyask  <b>Dave Bowen</b> , Manager	Manitoba Hydro	New Generation Construction Division Engineering & Construction Project Services	5 December, 2012	Winnipeg	Donal O’Leary
16	<b>Ed Wojczynski</b> , Division Manager  <b>Liz Carriere</b> , Manager  <b>Terry Miles</b> , Manager	Manitoba Hydro	Portfolio Projects Management Division  Financial Planning  Resource Planning & Market Analysis	5 December, 2012	Winnipeg	Joerg Hartmann

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
17	<b>Shawna Pachal</b> , Division Manager <b>Brenda Froese</b> Manager <b>Jane Kidd-Hansch</b> Partnership Implementation Supervisor	Manitoba Hydro	Power Projects Development Division Major Project Partnership & Services New Generation Partnership Implementation	5 December, 2012	Winnipeg	Aida Khalil
18	<b>Al Wolfram</b> Manager <b>Marc St. Laurent</b> Section Head - Keeyask/Burntwood River Planning <b>Jarrold Malenchak</b> , Section Head - Sediment & Ice Studies	Manitoba Hydro	Safety Regulations  Hydro Power Planning  Water Resources Engineering	5 December, 2012	Winnipeg	Donal O’Leary
19	<b>Brian Smith</b> , Manager	Province of Manitoba – Culture, Heritage & Tourism	Archaeological Assessment Services	5 December, 2012	Winnipeg	Aida Khalil
20	<b>Marc St. Laurent</b> , Section Head - Keeyask/Burntwood River Planning <b>Nick Barnes Sr</b> Regulatory Achievement Advisor <b>Carolyn Northover</b> , Sr Environmental Specialist	Manitoba Hydro	Hydro Power Planning  Major Projects Assessment/Licensing  Environmental Licensing & Protection	5 December, 2012	Winnipeg	Simon Howard
21	<b>Vicky Cole</b> , Manager  <b>Mark Manzer</b> , Socio-Economic Assessment Supervisor <b>Susan Collins</b> , Sr Analyst	Manitoba Hydro	Major Projects Assessment/Licensing Major Projects Assessment/Licensing  Policy & Strategic Initiatives	5 December, 2012	Winnipeg	Bernt Rydgren

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
22	<b>Marc St. Laurent</b> , Section Head - Keeyask/Burntwood River Planning <b>Nick Barnes</b> , Sr Regulatory Achievement Advisor <b>Carolyn Northover</b> , Sr Environmental Specialist	Manitoba Hydro	Hydro Power Planning  Major Projects Assessment/Licensing  Environmental Licensing & Protection	5 December, 2012	Winnipeg	Simon Howard
23	<b>Ed Wojczynski</b> , Division Manager <b>Joanne Flynn</b> , Division Manager <b>Connie Gamble</b> , Manager	Manitoba Hydro	Portfolio Projects Management Division  Power Planning Division  Project Sustainability Review/Coordination	5 December, 2012	Winnipeg	Bernt Rydgren
24	<b>Marc St. Laurent</b> , Section Head - Keeyask/Burntwood River Planning <b>Nick Barnes</b> , Sr Regulatory Achievement Advisor <b>Carolyn Northover</b> , Sr Environmental Specialist	Manitoba Hydro	Hydro Power Planning  Major Projects Assessment/Licensing  Environmental Licensing & Protection	5 December, 2012	Winnipeg	Aida Khalil
25	<b>Habib Ahmari</b> , Sediment & Erosion Studies Engineer <b>Wil DeWit</b> , Studies Engineer - Keeyask/Burntwood River Planning <b>Frederike Schneider-Viera</b> , Consultant	Manitoba Hydro   North/South Consultants Inc.	Water Resources Engineering  Hydro Power Planning	5 December, 2012	Winnipeg	Simon Howard

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
26	<b>Robert Flett</b> , Bipole III OWL Staff Community Members/Elders: <b>Norman Flett</b> <b>Mark Flett</b> <b>Elija Dyck</b> <b>Roddy Spence</b> <b>John Garson</b> <b>Mary Flett</b> <b>Albert Keeper</b>	Tataskweyak Cree Nation		6 December, 2012	Split Lake	Bernt Rydgren
27	<b>Ted Bland</b> , Sr Negotiator	York Factory First Nation		6 December, 2012	York Landing	Aida Khalil
28	<b>Roy Beardy</b> , Community Consultant Coordinator	York Factory First Nation		6 December, 2012	York Landing	Aida Khalil
29	<b>Jim Beardy</b> , Community Member & Consultant	York Factory First Nation		6 December, 2012	York Landing	Aida Khalil
30	<b>Wayne Redhead</b> , Future Development Coordinator	York Factory First Nation		6 December, 2012	York Landing	Aida Khalil
31	<b>Daryll Hedman</b> , Regional Wildlife Manager	Province of Manitoba- Conservation & Water Stewardship	Northeast Region	6 December, 2012	Winnipeg- Thompson (via telephone conference)	Joerg Hartmann
32	<b>Dave Cormie</b> , Division Manager <b>Efrem Teklemariam</b> , Manager <b>Marc St. Laurent</b> , Section Head - Keeyask/Burntwood River Planning <b>Terry Miles</b> , Manager	Manitoba Hydro	Power Sales & Operations Division Water Resources Engineering Hydro Power Planning  Resource Planning & Market Analysis	6 December, 2012	Winnipeg	Simon Howard
33	<b>Ken Tennenhouse</b> , General Counsel & Corporate Secretary <b>Ed Wojczynski</b> , Division Manager <b>Brenda Froese</b> , Manager	Manitoba Hydro	Portfolio Projects Management Division Major Project Partnership & Services	6 December, 2012	Winnipeg	Donal O'Leary

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
34	<b>Halina Zbigniewicz,</b> Manager	Manitoba Hydro	Hydro Power Planning	6 December, 2012	Winnipeg	Doug Smith
35	<b>Kim Sharman,</b> Former President & Chief Executive Officer <b>Allan Goddard,</b> Director, Governance Training & Senior Corporate	Crown Corporations Council		6 December, 2012	Winnipeg	Donal O'Leary
36	<b>Marc St. Laurent,</b> Section Head - Keeyask/Burntwood River Planning <b>Jarrod Malenchak,</b> Section Head - Sediment & Ice Studies <b>Kristina Koenig,</b> Acting Section Head - Hydrologic & Hydroclimatic Studies	Manitoba Hydro	Hydro Power Planning  Water Resources Engineering  Water Resources Engineering	6 December, 2012	Winnipeg	Simon Howard
37	<b>Edward Ouskin,</b> Community Member	War Lake First Nation		6 December, 2012	Ilford	Aida Khalil
38	<b>Ivan Moose,</b> Community Member	Fox Lake Cree Nation		6 December, 2012	Gillam	Bernt Rydgren
39	<b>Sophie Lockhart,</b> Employee <b>Lena Spence</b> Hanson, Band Councillor <b>Robert Wavey,</b> Band Councillor <b>Noah Massan,</b> Elder	Fox Lake Cree Nation		6 December, 2012	Gillam	Bernt Rydgren
40	<b>James Matthewson,</b> Sr Environmental Assessment Officer - Licensing & Environmental Assessment <b>David Block,</b> Environmental Specialist	Manitoba Hydro	Transmission Planning & Design  Licensing & Environmental Assessment	6 December, 2012	Winnipeg	Joerg Hartmann

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
41	<b>Glen Schick</b> , Manager  <b>Marc St. Laurent</b> , Section Head - Keeyask/Burntwood River Planning <b>Krista Halayko</b> , Section Head	Manitoba Hydro	Keeyask Engineering & Construction  Hydro Power Planning  Dam Safety, Civil Engineering	6 December, 2012	Winnipeg	Donal O'Leary
42	<b>Rob Matthews, P. Geo.</b> , Manager	Province of Manitoba- Conservation & Water Stewardship	Water Use Licensing, Regulatory Services, Ecological Services	6 December, 2012	Winnipeg	Doug Smith
43	<b>Ed Wojczynski</b> , Division Manager  <b>Nick Barnes</b> , Sr Regulatory Achievement Advisor <b>Shelley Matkowski</b> , Sr Environmental Specialist - Fisheries & Stewardship	Manitoba Hydro	Portfolio Projects Management  Major Projects Assessment/Licensing  Environmental Licencing & Protection	6 December, 2012	Winnipeg	Joerg Hartmann
44	<b>Glen Schick</b> , Manager <b>Blair Purvis</b> , Keeyask Project Support Specialist	Manitoba Hydro	Keeyask Engineering & Construction	6 December, 2012	Winnipeg	Donal O'Leary
45	<b>Dr. George Chuchman</b> , Associate Professor of Economics	University of Manitoba	Department of Economics	6 December, 2012	Winnipeg	Doug Smith
46	<b>Ryan Kustra</b> , Manager  <b>Marc St. Laurent</b> Section Head - Keeyask/Burntwood River Planning <b>Nick Barnes</b> , Sr Regulatory Achievement Advisor <b>Vicky Cole</b> , Manager	Manitoba Hydro	Keeyask Regulatory & Licensing  Hydro Power Planning  Major Projects Assessment/Licensing  Major Projects Assessment/Licensing	6 December, 2012	Winnipeg	Joerg Hartmann



Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
47	<b>Marc St. Laurent</b> Section Head - Keeyask/Burntwood River Planning	Manitoba Hydro	Hydro Power Planning	6 December, 2012	Winnipeg	Doug Smith
48	<b>Joanne Flynn,</b> Division Manager <b>Terry Miles,</b> Manager	Manitoba Hydro	Power Planning Division  Resource Planning & Market Analysis	6 December, 2012	Winnipeg	Joerg Hartmann
49	<b>Peter Miller,</b> Vice- President,	Green Action Centre	Board of Directors	7 December, 2012	Winnipeg	Joerg Hartmann
50	<b>Dave Martin,</b> Executive Director	Allied Hydro Council of Manitoba		7 December, 2012	Winnipeg	Donal O'Leary
51	<b>Gaile Whelan-Enns,</b> Director	Manitoba Wildlands		7 December, 2012	Winnipeg	Joerg Hartmann
52	<b>James Matthewson</b> Sr Environmental Assessment Officer <b>Patrick Allen,</b> Engineer	Manitoba Hydro	Licensing & EA, Transmission Planning & Design  Transmission Project Management, Transmission Construction & Line Maintenance	7 December, 2012	Winnipeg	Doug Smith
53	<b>Ron Frykas,</b> On Site Assistant Project Manager	Sigfusson Northern		7 December, 2012	Keeyask Camp Site	Aida Khalil
54	<b>Brian Beyak,</b> Civil Engineer - Keeyask Project	Manitoba Hydro	Keeyask Engineering & Construction	7 December, 2012	Keeyask Camp Site	Bernt Rydgren
55	<b>Sophia Garrick,</b> Site Environmental Officer	Manitoba Hydro	Keeyask Infrastructure Project, Keeyask Engineering & Construction	7 December, 2012	Keeyask Camp Site	Bernt Rydgren
56	<b>Vicky Cole,</b> Manager  <b>Monica Wiest,</b> Environmental Specialist - Socio- Economic Assessment <b>Janet Kinley,</b> Consultant	Manitoba Hydro   Intergroup Consultants Ltd.	Major Projects Assessment/Licensing Major Projects Assessment/Licensing	7 December, 2012	Winnipeg	Doug Smith

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
57	<b>Glen Schick</b> , Manager <b>Greg McNeill</b> , Manager <b>Lucena Scanlon</b> , Purchasing Supervisor	Manitoba Hydro	Keeyask Engineering & Construction Corporate Purchasing Major Projects Procurement, Purchasing	7 December, 2012	Winnipeg	Donal O'Leary
58	<b>Tracey Braun</b> , Director Environmental Approvals	Province Manitoba- Conservation & Water Stewardship	Climate Change & Environmental Protection	7 December, 2012	Winnipeg	Doug Smith
59	<b>Ed Wojczynski</b> , Division Manager <b>Nick Barnes</b> , Sr Regulatory Achievement Advisor <b>Vicky Cole</b> , Manager	Manitoba Hydro	Portfolio Projects Management Division Major Projects Assessment/Licensing  Major Projects Assessment/Licensing	7 December, 2012	Winnipeg	Joerg Hartmann
60	<b>Martina Saunders</b> , Future Development Officer	York Factory First Nation		7 December, 2012	Winnipeg	Doug Smith
61	<b>Nick Barnes</b> , Sr Regulatory Achievement Advisor <b>Carolyn Northover</b> , Sr Environmental Specialist <b>Sara Wakelin</b> , Environmental Specialist - Major Projects & Protection Programs	Manitoba Hydro	Major Projects Assessment/Licensing  Environmental Licensing & Protection  Environmental Licensing & Protection	7 December, 2012	Winnipeg	Joerg Hartmann
62	<b>James Goymer</b> , Mayor <b>Jackie Clayton</b> , Chief Administrative Officer	Town of Gillam		7 December, 2012	Gillam	Bernt Rydgren
63	<b>Glen Schick</b> , Manager	Manitoba Hydro	Keeyask Engineering & Construction	10 December, 2012	Winnipeg	Aida Khalil
64	<b>Bruce Owen</b> , Journalist	Winnipeg Free Press		10 December, 2012	Winnipeg	Donal O'Leary

Ref	Interviewee/s, Position	Organization	Department	Date	Location	Lead Interviewer
65	<b>Don MacDonald,</b> Fisheries Manager - Fisheries Branch Northeastern Region	Province of Manitoba- Conservation & Water Stewardship	Ecological Services	10 December, 2012	Winnipeg- Thompson (via telephone conference)	Joerg Hartmann
66	<b>Jim Crone,</b> Executive Director	Province of Manitoba- Innovation, Energy & Mines	Energy Division	10 December, 2012	Winnipeg	Bernt Rydgren
67	<b>Keith Freeman,</b> Pointe Du Bois & Keeyask CSS Engineer	Manitoba Hydro	Project Services, New Generation Construction	10 December, 2012	Winnipeg	Joerg Hartmann
68	<b>Halina Zbigniewicz,</b> Manager	Manitoba Hydro	Hydro Power Planning	10 December, 2012	Winnipeg	Doug Smith
69	<b>Gail Fifik, MA, CA.CIA, EP(EMSLA),</b> Coordinator	Manitoba Hydro	Internal Audit	13 December, 2012	Winnipeg, Canada – Washington DC USA (via telephone)	Donal O’Leary
70	<b>Glen Schick,</b> Manager	Manitoba Hydro	Keeyask Engineering & Construction	14 December, 2012	Winnipeg, Canada – Washington DC USA (via telephone)	Donal O’Leary
71	<b>Marc St. Laurent</b> Section Head - Keeyask/Burntwood River Planning	Manitoba Hydro	Hydro Power Planning	18 December, 2012	Winnipeg, Canada – Washington DC, USA (via telephone conference)	Donal O’Leary
72	<b>Tony Bennett</b> Chair	Dam Safety Panel of Experts		2013-07-02	Toronto (by telephone)	Donal O’Leary
73	<b>Mark St. Laurent</b> Section Head Keeyask/Burntwood River Planning <b>Krista Halayko</b> Section Head <b>Glen Schick</b> Manager <b>Jarred Malenchak</b> Section Head Sediment and Ice Studies <b>Halina Zbigniewicz</b> Manager	MH	Hydro Power Planning  Dam Safety, Civil Engineering Keeyask Engineering and Construction  Water Resources Engineering  Hydro Power Planning	2013-07-02	Winnipeg (by telephone)	Donal O’Leary

## Appendix C: Documentary Evidence

Ref	Topic	Author	Year	Document	Language	Web Link
1	1, 5, 10, 13, 15, 17, 18, 23	Fox Lake Cree Nation, Manitoba Hydro	2009	Adverse Effects Agreement – Fox Lake Cree Nation	English	<a href="http://www.hydro.mb.ca/projects/keeyask/fox_lake_aea.pdf">http://www.hydro.mb.ca/projects/keeyask/fox_lake_aea.pdf</a>
2	1, 5, 10, 13, 15, 17, 18, 19, 23	Tataskweyak Cree Nation, Manitoba Hydro	2009	Adverse Effects Agreement – Tataskweyak Cree Nation	English	<a href="http://www.hydro.mb.ca/projects/keeyask/tataskweyak_aea.pdf">http://www.hydro.mb.ca/projects/keeyask/tataskweyak_aea.pdf</a>
3	1, 5, 10, 13, 15, 17, 18, 20, 23	War Lake First Nation, Manitoba Hydro	2009	Adverse Effects Agreement – War Lake First Nation	English	<a href="http://www.hydro.mb.ca/projects/keeyask/war_lake_aea.pdf">http://www.hydro.mb.ca/projects/keeyask/war_lake_aea.pdf</a>
4	1, 5, 10, 13, 15, 17, 18, 21, 23	York Factory First Nation, Manitoba Hydro	2009	Adverse Effects Agreement – York Factory First Nation	English	<a href="http://www.hydro.mb.ca/projects/keeyask/york_aea.pdf">http://www.hydro.mb.ca/projects/keeyask/york_aea.pdf</a>
5	1, 4, 15	Tataskweyak Cree Nation, Manitoba Hydro	2000	Agreement in Principle – Tataskweyak Cree Nation and Manitoba Hydro	English	
6	1	Manitoba Hydro	2003	Agreement Respecting the Terms of Participation	English	
7	7	Manitoba Hydro	2009	An Introduction to the SPLASH Model	English	
8	3	Manitoba Hydro	2012	Application under The Water Power Act	English	<a href="http://www.gov.mb.ca/watertewardship/licensing/keeyask.html">http://www.gov.mb.ca/watertewardship/licensing/keeyask.html</a>
9	13, 15, 19, 21, 23	Keeyask Hydropower Limited Partnership		Aquatic Effects Monitoring/ Management Plan (AEMP)- Draft	English	
10	2	Manitoba Hydro	2011	Article- Receipt of Jets Tickets	English	
11	16	Manitoba Hydro		BNA Payroll Screenshots	English	
12	2, 10, 12, 13, 15, 16	Hydro Projects Management Association, Allied Hydro Council of Manitoba, and numerous Unions.	2011	Burntwood/Nelson Agreement (BNA), Revision 10	English	<a href="http://www.hydro.mb.ca/projects/bna_agreement.pdf">http://www.hydro.mb.ca/projects/bna_agreement.pdf</a>
13	1,2, 13, 15	Government of Canada	1982	Canada's Constitution Act of 1982, Section 35	English	<a href="http://lois.justice.gc.ca/eng/Constitution/page-16.html#h-52">http://lois.justice.gc.ca/eng/Constitution/page-16.html#h-52</a>
14	16	Manitoba Hydro	2012	Capital Cost Estimates (Keeyask)	English	
15	21	Province of Manitoba	Various	CCME Environmental Quality Guidelines	English	<a href="http://www.ccme.ca/publications/ccme_ccqe.html">http://www.ccme.ca/publications/ccme_ccqe.html</a>
16	7	CEATI	2012	CEATI Planning & Optimization Working Group Questionnaire	English	
17	7		2012	Climate Change Study Plan	English	
18	1, 2, 12	Manitoba Hydro	2012	Code of Ethics	English	<a href="http://www.hydro.mb.ca/corporate/code_of_ethics.shtml">http://www.hydro.mb.ca/corporate/code_of_ethics.shtml</a>
19	16		2009-2012	Collective Agreement - Manitoba Hydro and AMHSSE	English	

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20	16	Manitoba Hydro	2009-2012	Collective Agreement between Manitoba Hydro and CUPE 998	English	
21	16	Manitoba Hydro	2009-2011	Collective Agreement between Manitoba Hydro and IBEW 2034	English	
22	6, 12	Manitoba Hydro	2011	Contract Binders	English	
23	2, 6	Manitoba Hydro	2012	Corporate Organizational Chart	English	
24	2, 8, 16	Manitoba Hydro	2012/2013	Corporate Strategic Plan, - Mission Statement: Goal # 1	English	<a href="http://www.hydro.mb.ca/corporate/csp/csp_2012.pdf">http://www.hydro.mb.ca/corporate/csp/csp_2012.pdf</a>
25	6, 19	Manitoba Hydro		Credentials of specialists, List of Key Personnel	English	<a href="http://keeyask.com/wp/wp-content/uploads/2012/07/Response-to-EIS-Guidelines-part-1-of-7.pdf">http://keeyask.com/wp/wp-content/uploads/2012/07/Response-to-EIS-Guidelines-part-1-of-7.pdf</a>
26	9	Moody's, Standard & Poor's, and DBRS	Various	Credit Ratings	English	
27	4, 22	Manitoba Hydro		Design Memo's, Stage 4	English	
28	6, 12	Manitoba Hydro	Various	Direct negotiated contracts	English	
29	16	Manitoba Hydro	2012	Discrimination & Harassment Free Workplace Guideline	English	<a href="http://www.hydro.mb.ca/careers/employment_equity/discrimination_and_harassment_free_workplace.shtml">http://www.hydro.mb.ca/careers/employment_equity/discrimination_and_harassment_free_workplace.shtml</a>
30	5, 19, 23	Manitoba Hydro		Draft Letter to Department of Fisheries and Oceans, Concerning Compensation	English	
31	16			Employment Report Keeyask Project	English	
32	8, 16	Manitoba Hydro	2012	Environment Report /incident records for infrastructure project, Hazardous Material Release Reports	English	
33	19			Environmental Study Report List, Appendix 6A	English	<a href="http://keeyask.com/wp/wp-content/uploads/2012/07/Response-to-EIS-Guidelines-part-5a-of-7.pdf">http://keeyask.com/wp/wp-content/uploads/2012/07/Response-to-EIS-Guidelines-part-5a-of-7.pdf</a>
34	16	Manitoba Hydro	2012	Example of DNC – Reviewed on site	English	
36	19	Province of Manitoba		Government – Relevant provincial and federal legislation and policies, Concordance Table 4.4	English	<a href="http://keeyask.com/wp/wp-content/uploads/2012/07/Response-to-EIS-Guidelines-part-1-of-7.pdf">http://keeyask.com/wp/wp-content/uploads/2012/07/Response-to-EIS-Guidelines-part-1-of-7.pdf</a>
40	17	Manitoba Hydro		Heritage Poster	English	
41	16	ILO	2012	ILO conventions and country status – Canada	English	<a href="http://www.ilo.org/declaration/follow-up/annualreview/ratificationstatus/lang--en/index.htm">http://www.ilo.org/declaration/follow-up/annualreview/ratificationstatus/lang--en/index.htm</a>
42	2, 5			Independent Certification to ISO 14001 EMS standard	English	
43	6	Manitoba Hydro	2012	Integrated cost estimate – Construction	English	
44	6	Manitoba Hydro		Integrated cost estimate, work and cost breakdown structures – Pre-Construction	English	
45	1, 2, 10	Manitoba Hydro	2009	JKDA – Obligations – matrix (screenshot) / and demonstration	English	

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46	1, 2, 10, 13, 15	Manitoba Hydro		JKDA, Meeting Minutes	English	
47	1, 2, 4, 8, 9, 10, 12, 13, 15, 16, 17, 18, 20, 22, 23	TCN, WLFN, YFFN, FLCN and the Manitoba Hydro-Electric Board. 2009.	2009	JKDA, the Joint Keeyask Development Agreement	English	<a href="http://www.hydro.mb.ca/projects/keeyask/jkd_agreement.shtml">http://www.hydro.mb.ca/projects/keeyask/jkd_agreement.shtml</a>
48	22	Manitoba Hydro	2012	Keeyask - IHA SAP – Topic 22 – Reservoir Planning – Presentation prepared for the assessment	English	
49	6	Manitoba Hydro	2012	Keeyask Advisory Group Meeting Agenda	English	
50	17	Manitoba Hydro		Keeyask Booklet of Heritage Sites Final	English	
51	16, 17, 18	Manitoba Hydro	Draft	Keeyask Camp Rules (worker conditions & safety)	English	
53	6	Manitoba Hydro	2012	Keeyask detailed integrated Master Schedule – Construction	English	
54	6	Manitoba Hydro		Keeyask detailed integrated Master Schedule – Pre-Construction	English	
55	1, 5	Manitoba Hydro	2011	Keeyask Generation Project – Major Project Management Office submission, Project Description	English	
56	4, 6, 23	Manitoba Hydro	2012	Keeyask Generation Project – Field Site Visit Map folder	English	
57	1, 3, 4, 5, 7, 8, 10, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis">http://keeyask.com/wp/the-project/environmental-assessment-process/eis</a>
58	4, 5, 13, 15, 18, 19, 20, 21, 23	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Aquatic Environment Supporting Volume	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/aquatic-environment">http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/aquatic-environment</a>
59	1, 4, 5, 10, 15, 17, 18, 19	Cree Nation Partners (Tataskweyak Cree Nation and War Lake First Nation)	2012	Keeyask Generation Project. Environmental Impact Statement, Cree Nation Partners Keeyask Environmental Evaluation Report	English	<a href="http://keeyask.com/wp/wp-content/uploads/2012/07/CNP-Keeyask-Environmental-Evaluation-Web-Jan2012.pdf">http://keeyask.com/wp/wp-content/uploads/2012/07/CNP-Keeyask-Environmental-Evaluation-Web-Jan2012.pdf</a>
60	1, 4, 5, 10, 15, 17, 18	Fox Lake Cree Nation	2012	Keeyask Generation Project. Environmental Impact Statement, Fox Lake Cree Nation Environment Evaluation Report	English	<a href="http://keeyask.com/wp/wp-content/uploads/2012/07/FLCN-Environment-Evaluation-Report_Sept_2012.pdf">http://keeyask.com/wp/wp-content/uploads/2012/07/FLCN-Environment-Evaluation-Report_Sept_2012.pdf</a>
61	1, 3, 4, 5, 15	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Our Story (video)	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis/video-keeyask-our-story">http://keeyask.com/wp/the-project/environmental-assessment-process/eis/video-keeyask-our-story</a>
62	4, 5, 7, 13, 15, 20, 21,	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Physical	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-">http://keeyask.com/wp/the-project/environmental-assessment-</a>

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	22, 23			Environment Supporting Volume		<a href="#">process/eis/supporting-volume/physical-environment</a>
63	4, 5, 8, 13, 15, 20, 22, 23	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Project Description Supporting Volume	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/project-description">http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/project-description</a>
64	1, 4, 10, 13, 15, 16, 17, 22, 23	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Public Involvement Program Supporting Volume	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/public-involvement">http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/public-involvement</a>
65	5, 13, 15, 18, 20, 21	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Socio-Economic Environment Supporting Volume	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/socio-economic">http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/socio-economic</a>
66	5, 13, 15, 19	Keeyask Hydropower Limited Partnership	2012	Keeyask Generation Project. Environmental Impact Statement, Terrestrial Environment Supporting Volume	English	<a href="http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/terrestrial-environment">http://keeyask.com/wp/the-project/environmental-assessment-process/eis/supporting-volume/terrestrial-environment</a>
67	1, 4, 5, 10, 15, 17, 18	York Factory First Nation. Support from Hilderman, Thomas, Frank, Cram and Northern Light Heritage Services	2012	Keeyask Generation Project. Environmental Impact Statement, York Factory First Nation Evaluation Report: Our Voices	English	<a href="http://keeyask.com/wp/wp-content/uploads/2012/07/Kipekiskwaywinan_Our-Voices_June_2012_Part-1.pdf">http://keeyask.com/wp/wp-content/uploads/2012/07/Kipekiskwaywinan_Our-Voices_June_2012_Part-1.pdf</a>
68	17	Northern Lights Heritage Services Inc.	2010	Keeyask Generation Project: Keeyask Project HRIA Heritage Permit Report A25-10 Archaeological Field Investigations Formal Excavation of the Pointe West Site (HbKx-02), a Proxy Site. Investigated for the Keeyask Generation Project HRIA	English	
69	17	Northern Lights Heritage Services Inc.	Mar-09	Keeyask heritage handbook	English	
70	ALL		2012	Keeyask High Level Introductory Presentation December 4 <sup>th</sup> , 2012	English	
71	16	Contractor	2012	Keeyask Infrastructure project – Examples of training records	English	
72	16	Manitoba Hydro / Contractor	2012	Keeyask Infrastructure project – Safe work procedures	English	
73	1, 4, 5, 10, 13, 15, 17	Keeyask Hydropower Limited Partnership		Keeyask Infrastructure Project Environmental Assessment	English	
74	8, 16	Keeyask Hydropower Limited Partnership	2011	Keeyask Infrastructure Project Safety Management Plan – Draft	English	
75	6, 13, 15, 20, 21, 22	Keeyask Hydropower Limited Partnership		Keeyask Infrastructure Project, Construction Environmental Protection Plan	English	
76	18, 22	Manitoba Hydro		Keeyask Mercury and Human Health Technical Working	English	

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				Group, Meeting Minutes		
78	6, 16	Manitoba Hydro	November 2012	Keeyask Pre-Construction Project (example of Monthly Report)	English	
79	13, 15	Manitoba Hydro	2009	Keeyask Overview Timeline	English	
80	1, 2		2002	Keeyask Process Agreement	English	
81	1, 6	Manitoba Hydro	2012	Keeyask Project Charter – Pre-Construction	English	
82	16	Manitoba Hydro	2012	Keeyask Project Monthly Report	English	
83	12	Manitoba Hydro	2012	Keeyask Project Monthly Report – Construction	English	
84	17	Manitoba Hydro	2012	Keeyask Transmission Heritage Resources Impact Assessment	English	
85	1, 4, 5, 13, 15	Manitoba Hydro	2012	Keeyask Transmission Project Environmental Assessment Report	English	
86	5, 6, 13, 15	Manitoba Hydro	2012	Keeyask Transmission Project Environmental Protection Plan	English	
87	8, 16	Province of Manitoba	2012	KIP Labor Inspection Report	English	
88	8, 16	NGC	2012	KIP Safety Performance Report	English	
89	5	Manitoba Hydro		KIP/ Wuskwatim Generating Station/Wuskwatim Transmission License	English	
90	2, 15	Manitoba Hydro		Lessons Learned Slides Energizing Nisichawayasihk Cree Nation and Manitoba for Success, Presentation	English	
91	7, 22	Manitoba Hydro	2012	Manitoba Hydro Climate Change Report	English	
93	2	Manitoba Hydro		Manitoba Hydro Operating Principles	English	
94	8, 22	Manitoba Hydro	2011	Manitoba Hydro Policy 306 Public Water Safety Around Dams Program Policy	English	
95	2, 12	Manitoba Hydro		Manitoba Hydro Policy G1-6 Purchase Approvals	English	
96	8	Manitoba Hydro	2008	Manitoba Hydro Policy G303 Dam Safety Program	English	
97	2, 12	Manitoba Hydro		Manitoba Hydro Policy G408 Board Approval for Purchases	English	
98	12	Manitoba Hydro		Manitoba Hydro Policy G425 Call for Formal Tenders or Quotations	English	
99	12	Manitoba Hydro		Manitoba Hydro Policy G427 Band Council Resolution for Commercial Agreements	English	
100	2	Manitoba Hydro		Manitoba Hydro Policy G850 Environmental Management	English	
101	1, 2	Manitoba Hydro		Manitoba Hydro Policy G851 Sustainable Development – Guiding Principles	English	



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102	16	Manitoba Hydro		Manitoba Hydro Policy Health and Safety	English	
103	2, 16	Manitoba Hydro	2012	Manitoba Hydro Policy Human Resources	English	
104	12	Manitoba Hydro		Manitoba Hydro Policy Manitoba Content Policy	English	
105	2	Manitoba Hydro		Manitoba Hydro Policy Manitoba Hydro Integrity Program- Whistle Blowing	English	
106	12	Manitoba Hydro		Manitoba Hydro Policy Northern Purchasing Policy (under review)	English	
107	7	Manitoba Hydro	2012	Manitoba Hydro Policy P195 Generation Planning Criteria	English	
109	2,12	Manitoba Hydro		Manitoba Hydro Policy P3 Integrity Policy/Program	English	
110	12	Manitoba Hydro		Manitoba Hydro Policy P410 Obtaining Goods or Services	English	
111	12	Manitoba Hydro		Manitoba Hydro Policy P421 Processing Change Orders	English	
112	2, 16	Manitoba Hydro		Manitoba Hydro Policy P593 Avoiding a Conflict of Interest Situation in the Recruitment and Selection Process	English	
113	2	Manitoba Hydro		Manitoba Hydro Policy P852 Management Review of Environmental Management Systems	English	
114	12	Manitoba Hydro	2003-2012	Manitoba Hydro Policy Purchasing	English	
115	13, 15	Manitoba Hydro	2012	Manitoba Hydro Trappers Notification/Compensation Policy	English	
116	2, 8, 9,12	Manitoba Hydro	2011/12	Manitoba Hydro-Electric Board Annual Report	English	<a href="http://www.hydro.mb.ca/corporate/ar/2011/publish/index.html">http://www.hydro.mb.ca/corporate/ar/2011/publish/index.html</a>
118	7	Manitoba Hydro	2010/11	Manitoba Hydro-System Operation Priorities PUB 2010-11 Hearings PUB I-147(a)	English	
119	3, 11	Province of Manitoba		Manitoba's Clean Energy Strategy	English	<a href="http://www.manitoba.ca/iem/energy/pdfs/energy_strategy_2012.pdf">http://www.manitoba.ca/iem/energy/pdfs/energy_strategy_2012.pdf</a>
120	17	Keeyask Hydropower Limited Partnership	2012	Keeyask EIS Core Document, Heritage Resources – Overview Presentation to Fox Lake Cree Nation; February 21 <sup>st</sup> , 2012	English	
121	18			Mercury and Human Health Working Group: Interim status report	English	
122	18			Mercury and Human Health Working Group: Meeting notes from 14 workshops	English	

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123	8, 16	NGC	2012	MH Incident or Injury	English	
124	3, 11	Marvin Shaffer & Associates Ltd., Scott Bias	2012	Multiple Account Benefit-Cost Analysis of Manitoba Hydro's Proposed Resource Development Plan – Methodology and Illustrative Application	English	
125	21	Province of Manitoba	Various	MWQ-SOG	English	<a href="http://www.gov.mb.ca/waterstewardship/water_quality/quality/website_notice_mwqsog_2011.html">http://www.gov.mb.ca/waterstewardship/water_quality/quality/website_notice_mwqsog_2011.html</a>
126	4, 8, 22	Government of Canada	2012	Navigable Waters Protection Act	English	<a href="http://laws-lois.justice.gc.ca/eng/acts/N-22/">http://laws-lois.justice.gc.ca/eng/acts/N-22/</a>
127	4, 8			Navigable Waters Protection Application Generation		
128	3, 11	Manitoba Hydro	2012	Needs for and Alternatives to (NFAT) Outline	English	
129	10			Org. chart Partnership, Implementation Section	English	
131	2, 4, 10, 13, 15	Manitoba Hydro	2010	World Energy Congress, Montreal. Paper on lessons learned from the Wuskwatim project	English	
132	5			Pembina Institute GHG LCA Report	English	
133	5, 19			Permits by Consultants, Geotechnical and Scientific	English	
134	12	Manitoba Hydro	Various	Policies and Procedures: New Generation Construction	English	
135	2, 7, 8, 12, 16		Various	Policy – Manitoba Hydro	English	
136	17	ECOSTEM Ltd.	2011	Potential Locations Along The North Access Road For Reburial Of Known Grave Sites That Would Be Flooded By The Keeyask Generation Project- Draft 1	English	
137	3, 7, 8, 9, 11	Manitoba Hydro	2011/12	Power Resource Plan	English	
138	3, 11	Manitoba Hydro	2012	Power Resource Plan, appendix on resource options, viewed under confidentiality	English	
139	4	Manitoba Hydro	1994	Presentation to Split Lake- Joint Study on Future Hydro Development in the Split Lake Area	English	
140	15, 17			PRLC, Meeting Minutes	English	




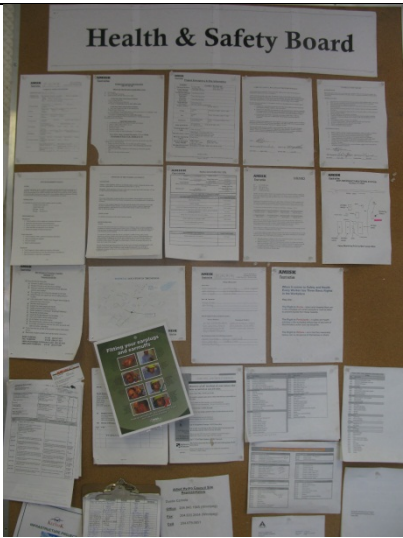
Ref	Topic	Author	Year	Document	Language	Web Link
141	3, 4	Manitoba Hydro	2012	Project description, Bipole III transmission reliability project	English	<a href="http://www.hydro.mb.ca/projects/bipoleIII/index.shtml">http://www.hydro.mb.ca/projects/bipoleIII/index.shtml</a>
142	6,12	Manitoba Hydro	2011	Project Implementation Plan (including Construction Management Plan)	English	
143	13, 15, 19, 20, 21, 22	Keeyask Hydropower Limited Partnership		Protection and Monitoring Plans	English	
144	19, 22, 23	Keeyask Hydropower Limited Partnership		Protection and Monitoring Plans Fish Habitat Compensation Plan – Draft	English	
145	6, 19, 20, 22	Keeyask Hydropower Limited Partnership		Protection and Monitoring Plans Environmental Protection Plan- In stream Construction Management Plan (SMP)	English	
146	8, 16	Province of Manitoba	2012	Province of Manitoba- Workplace Health and Safety Legislation/ Guidelines	English	<a href="http://web2.gov.mb.ca/laws/statutes/ccsm/w210e.php">http://web2.gov.mb.ca/laws/statutes/ccsm/w210e.php</a>
147	12	Province of Manitoba	2006	Provincial whistle-blower statute (annual report) (Public Interest Disclosure Act)	English	<a href="http://web2.gov.mb.ca/laws/statutes/2006/c03506e.php">http://web2.gov.mb.ca/laws/statutes/2006/c03506e.php</a>
148	10, 13, 15			Referendum Certificates from the communities Tataskweyak Cree Nation, War Lake First Nation, York Factory First Nation, Fox Lake Cree Nation	English	
149	12	Manitoba Hydro	2010	Request for Pre-Qualification for Turbine and Generator	English	
150	12	Manitoba Hydro	2011	Request for Proposal for the Turbine and Generator Contract (issued after the Request for Pre-Qualification).	English	
151	6	Manitoba Hydro		Risk Identification shown on internal sharepoint system	English	
152	6	Manitoba Hydro	Draft	Risk Register for Cost Risks	English	
153	8	Canadian Dam Association	2007	Safety Guidelines (Canadian Dam Association Guidelines)	English	
154	6, 8, 16	Manitoba Hydro	2012	Safety Management System, including Contractor Safety Management Plan	English	
156	6	Manitoba Hydro		Project Delivery Strategy (2010)	English	
157	2	Manitoba Hydro	2010/ 2011	Sustainable Development report	English	<a href="http://www.hydro.mb.ca/environment/publications/sdr_10_1_1.pdf">http://www.hydro.mb.ca/environment/publications/sdr_10_1_1.pdf</a>
158	5	Province of Manitoba	2012	The Environment Act License, 2952 R, revised April 13, 2012	English	
159	3	Province of Manitoba	2012	The Manitoba Water Strategy	English	<a href="http://www.gov.mb.ca/waterstewardship/waterstrategy/pdf/index.html">http://www.gov.mb.ca/waterstewardship/waterstrategy/pdf/index.html</a>
160	7	Prairie Provinces Water Board	2009	The Master Agreement on Apportionment and By-Laws, Rules and Procedures	English	
161	13	Thompson and Planning District with rePlan	2012	Thompson and Planning District Development Plan	English	<a href="http://www.thompson.ca/">http://www.thompson.ca/</a>
162	13	Thompson and Planning District with	2010	Thompson and Planning District Sustainable Community	English	<a href="http://www.thompson.ca/">http://www.thompson.ca/</a>

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		AECOM		Plan		
163	3	Province of Manitoba	2012	Tomorrow Now- Manitoba's Green Plan	English	<a href="http://gov.mb.ca/conservation/tomorrownowgreenplan/pdf/tomorrowNowBook.pdf">http://gov.mb.ca/conservation/tomorrownowgreenplan/pdf/tomorrowNowBook.pdf</a>
164	13	Town of Gillam and Dillon Consulting	2012	Town of Gillam Development Plan 2011-2040	English	<a href="http://www.gillamdevelopmentplan.com/">http://www.gillamdevelopmentplan.com/</a>
165	7	Manitoba Hydro	2009	Utilization of the SPLASH Computer Simulation Model to Represent Water Regime in the Manitoba Hydro System	English	
167	5, 19	Environment Canada		Woodland caribou recovery strategy	English	<a href="http://www.sararegistry.gc.ca/default.asp?lang=En&amp;n=33FF100B-1">http://www.sararegistry.gc.ca/default.asp?lang=En&amp;n=33FF100B-1</a>
168	6	Manitoba Hydro	2012	Work and cost breakdown structure - Construction	English	
169	2	Manitoba Hydro		Working groups/technical tables mechanisms arising out of agreements and meeting notes	English	
170	16, 18	Manitoba Hydro		Wuskwatim Camp Rules	English	
172	1	Manitoba Hydro	2000	Wuskwatim, Notigi and Gull Rapids Generating Stations and Transmission Facilities Environmental Assessment Study, Status report #1: Figure 4.3 concerning initial community groupings	English	
173	1	Manitoba Hydro	2012	Wuskwatim: Year in Review, 2011-12	English	
174	9, 11	Manitoba Hydro	2012	Integrated Financial Forecast (IFF11-2)	English	
175	11	Government of Manitoba		Budget 2012 Paper A ECONOMIC REVIEW AND OUTLOOK	English	<a href="http://www.gov.mb.ca/finance/budget12/papers/economy.pdf">http://www.gov.mb.ca/finance/budget12/papers/economy.pdf</a>
176	9, 11	Manitoba Hydro		DEBT MANAGEMENT STRATEGY 2012/13 AND 2013/14	English	<a href="http://www.hydro.mb.ca/regulatory_affairs/electric/gra_2012_2013/Appendix_17.pdf">http://www.hydro.mb.ca/regulatory_affairs/electric/gra_2012_2013/Appendix_17.pdf</a>
177	5	Manitoba Wildlands	February 3, 2012	Submission on Keeyask Generation Project Scoping Document		<a href="http://www.gov.mb.ca/conservation/eal/registries/5550keeyask/part4.pdf">http://www.gov.mb.ca/conservation/eal/registries/5550keeyask/part4.pdf</a>
178	19	Government of Manitoba	2011	Draft Action Plans for Boreal Woodland Caribou Ranges in Manitoba	English	<a href="http://www.gov.mb.ca/conservation/wildlife/pdf/caribou_action_plan_11_29_2011.pdf">http://www.gov.mb.ca/conservation/wildlife/pdf/caribou_action_plan_11_29_2011.pdf</a>
179	19	Manitoba Conservation and Water Stewardship Fisheries Branch	2012	Manitoba Lake Sturgeon Management Strategy	English	<a href="http://www.gov.mb.ca/waters_tewardship/fish/pdf/mb_sturgeon_mgmt_2012.pdf">http://www.gov.mb.ca/waters_tewardship/fish/pdf/mb_sturgeon_mgmt_2012.pdf</a>
180	11	Philippe U. Dunskey	2012	Written Testimony of Philippe U. Dunskey re. Manitoba Hydro's Demand-Side Management Plan	English	<a href="http://www.pub.gov.mb.ca/exhibits/mh-gra-2012-13-14-rnd2/ie/dunskey_mh_testimony_2012-11-30_corrected.pdf">http://www.pub.gov.mb.ca/exhibits/mh-gra-2012-13-14-rnd2/ie/dunskey_mh_testimony_2012-11-30_corrected.pdf</a>
181	5, 19	Pew Environment Group	2012	A Forest of Blue: Canada's Boreal	English	<a href="http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/PEGBorealWaterReport11March2011.pdf">http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/PEGBorealWaterReport11March2011.pdf</a>
182	12	Manitoba Hydro	2012	Purchase Approvals G1-G6 (Revised)	English	
184	2	Manitoba Hydro	2013	About Us	English	<a href="http://www.hydro.mb.ca/corporate/about_us.shtml?WT.mc_">http://www.hydro.mb.ca/corporate/about_us.shtml?WT.mc_</a>

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						<a href="#">id=2100</a>
185	2	Manitoba Hydro	2013	Manitoba Hydro-Electric Board	English	<a href="http://www.hydro.mb.ca/corporate/electric_board.shtml">http://www.hydro.mb.ca/corporate/electric_board.shtml</a>
186	2	Manitoba Hydro	2013	Regulatory Affairs	English	<a href="http://www.hydro.mb.ca/regulatory_affairs/index.shtml?WT.mc_id=2124">http://www.hydro.mb.ca/regulatory_affairs/index.shtml?WT.mc_id=2124</a>
187	2	Transparency International	2012	Corruption Perceptions Index 2012	English	
188	2	Transparency International	2011	Bribe Payers' Index 2011	English	
189	2	The Globe and Mail (Toronto)	18 Dec, 2012	New Corruption Allegations Hit SNC-Lavalin	English	
190	2	Winnipeg Free Press	3 Dec, 2012	SNC's New Reality (Editorial)	English	
191	1	Manitoba Hydro	2012	Wuskwatim: Monitoring Overview, 2011-12	English	
192	6	Manitoba Hydro	2010	Project Implementation Plan (draft)	English	
193	1	KHLP	2011	New Release: \$5.6 billion Keeyask Generating Station Announced	English	
194	1	Fox Lake Cree Nation		Website announcements of employment opportunities and open houses	English	<a href="http://www.foxlakecreenation.com/?s=keeyask">www.foxlakecreenation.com/?s=keeyask</a>
195	1	KHLP		KHLP website, including public involvement plan pages	English	<a href="http://Keeyask.com">http://Keeyask.com</a>
196	1	Cree Nation Partners		Cree Nation Partners website	English	<a href="http://www.creenationpartners.ca">www.creenationpartners.ca</a>
197	1	Canadian Environmental Assessment Agency		Public Notice: Keeyask Generation Project, Notice of Environmental Act Proposal, Public Comment Period and Federal Funding Available	English	<a href="http://www.ceaa-acee.gc.ca">www.ceaa-acee.gc.ca</a>
198	1			Multiple Project Crown – First Nation Consultation Framework: Her Majesty the Queen in Right of Manitoba as represented by Conservation and Water Stewardship ("Manitoba") and York Factory First Nation	English	
199	18	Hydro-Quebec		Fact sheet: Mercury in Hydroelectric Reservoirs	English	
200	1	KHLP		Keeyask Generation Project Environmental Impact Statement: Executive Summary	English	
201	1	Manitoba Hydro	May 2008	Round One of Public Involvement Program: Newsletter	English	
202	1	Manitoba Hydro	February 2012	Round Two of Public Involvement Program: Newsletter	English	
203	1	Manitoba Hydro	Not dated	Round One of Public Involvement Program: Information Panels	English	
204	1	Manitoba Hydro	Not dated	Round Two of Public Involvement Program: Information Panels	English	

Ref	Topic	Author	Year	Document	Language	Web Link
205	1	Manitoba Hydro	Not dated	Summary of Round One of the Public Involvement Programme	English	
206	1	Manitoba Hydro	15 July, 2010	Keeyask Project Communication Plan	English	
207	1	Manitoba Hydro	2008	Series of minutes to regular PRLC meetings held through 2008	English	
208	1	Manitoba Hydro	January 2008	Keeyask EIS Coordination Committee, January 2008, Recommendation to the Keeyask Partners PRLC to Proceed with Round One of the Public Involvement Programme	English	
209	1	Manitoba Hydro	2010	Series of agenda for meetings of the Keeyask Partners to discuss Keeyask Communication and Public Presence held through 2010	English	
210	1	Manitoba Hydro	2009	Memo from Manitoba Hydro to Keeyask Partners inviting them to participate in discussions on the Keeyask Communication Protocol	English	
211	8	Bennett, T., Imrie, A., Guillaud, C. and Pataky T.	2013	Keeyask GS-Design Phase Dam Safety Review: Independent Review to Benchmark with the Canadian Dam Association Guidelines.	English	
212	8	Manitoba Hydro	2013	Manitoba Hydro Dam Safety Program (G303) -Update	English	

## Appendix D: Visual Evidence

	
<p><b>Photo 1: Coarse ice below Gull Rapids</b></p>	<p><b>Photo 2: Gull Rapids from upstream</b></p>
	
<p><b>Photo 3: Kettle dam from the air</b></p>	<p><b>Photo 4: Contractor H&amp;S board</b></p>



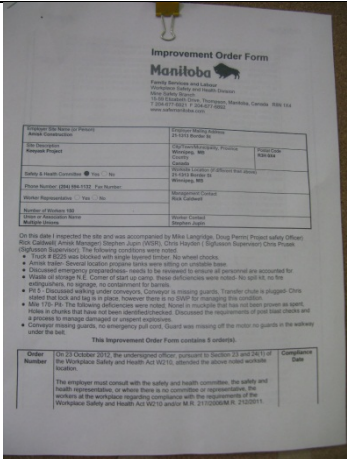

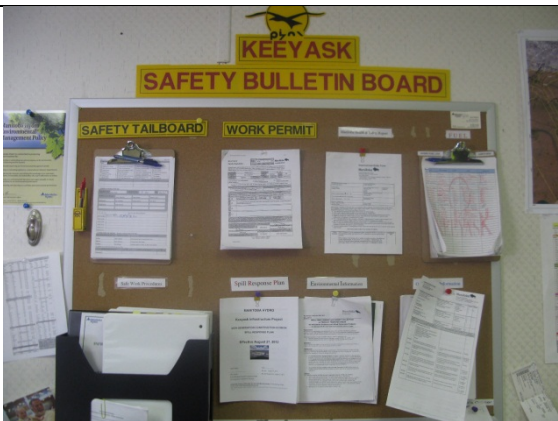


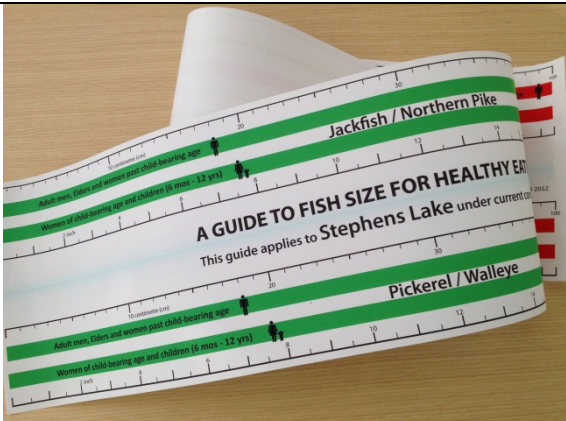
	
<p><b>Photo 5: Example of H&amp;S Improvement Order on MH noticeboard</b></p>	<p><b>Photo 6: MH camp office environmental emergency noticeboard</b></p>
	
<p><b>Photo 7: MH H&amp;S notice board</b></p>	<p><b>Photo 8: Northern road camp</b></p>
	
<p><b>Photo 9: View of the main camp and helipad</b></p>	<p><b>Photo 10: Draft health promotion materials fish measuring tape - showing detail of key</b></p>





Photo 11: Draft health promotion materials fish measuring tape (showing detail of key)



Photo 12: Draft health promotion materials placemat on Gull Lake restrictions



Photo 13: Draft health promotion materials placemat on Split Lake restrictions



Photo 14: Embankments ice erosion



Photo 15: Ice jams in the future reservoir area



Photo 16: Proposed dam location



**Photo 17: View of Gull Rapids**