Keeyask Generation Project

Environmental Impact Statement

Supporting Volume

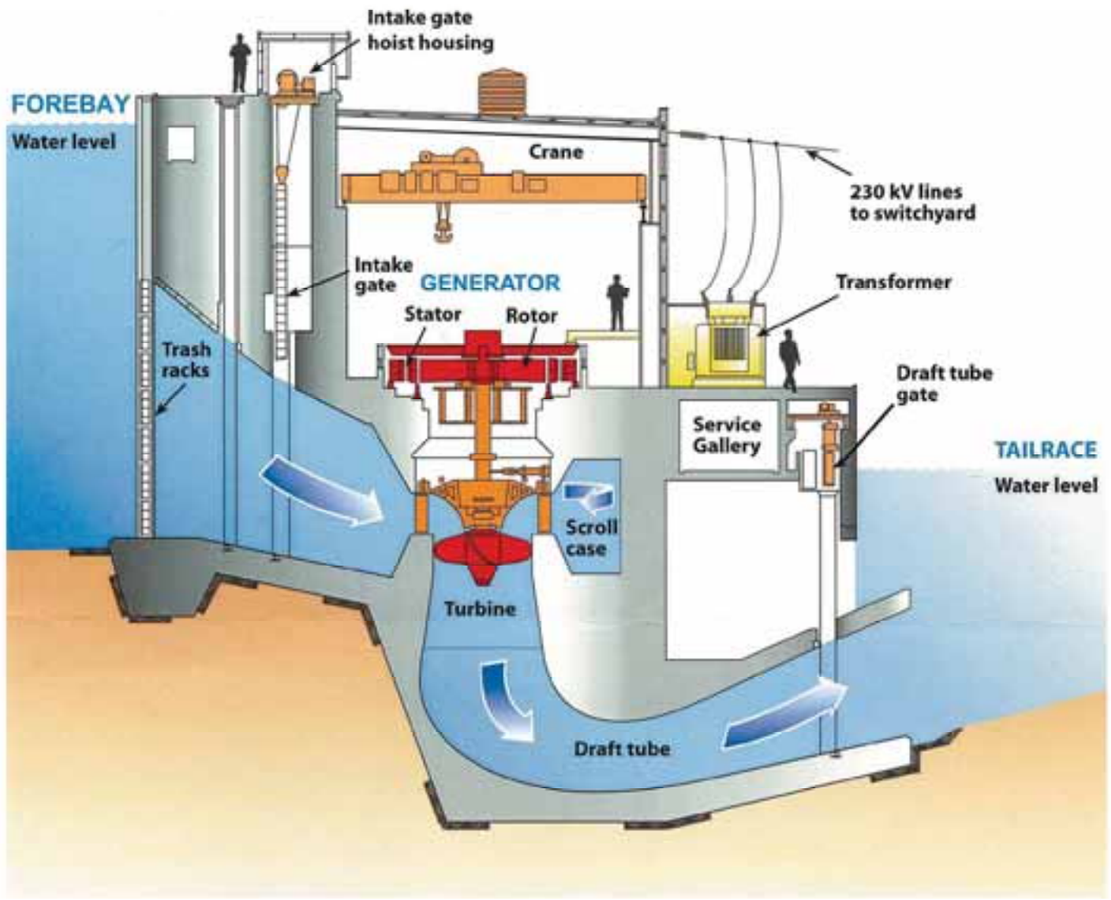
Project Description

KEEYASK

Hydropower Limited Partnership

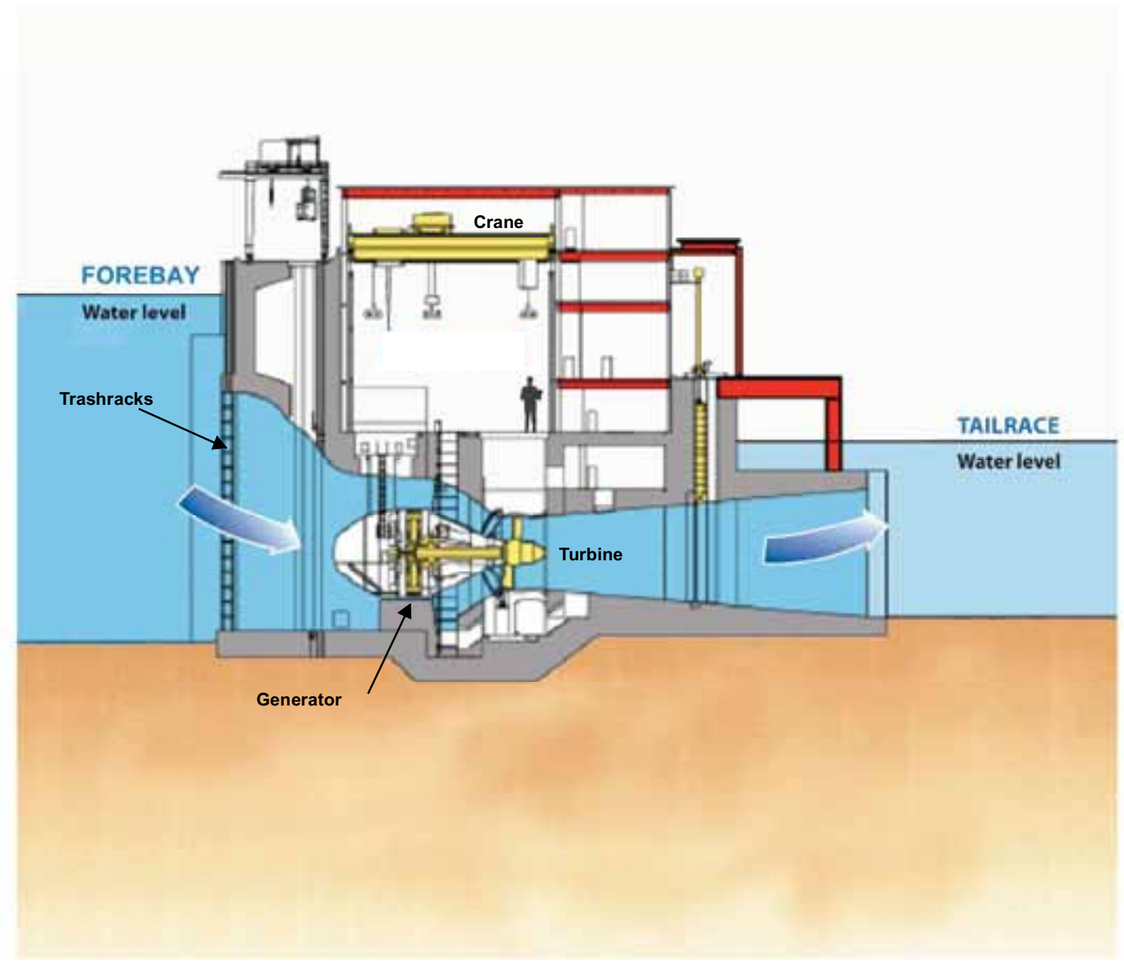
June 2012

Vertical Shaft Turbine
Powerhouse Cross Section



Source: http://www.hydro.mb.ca/corporate/facilities/gif/producing_elec_cross.gif

Bulb Turbine
Powerhouse Cross Section



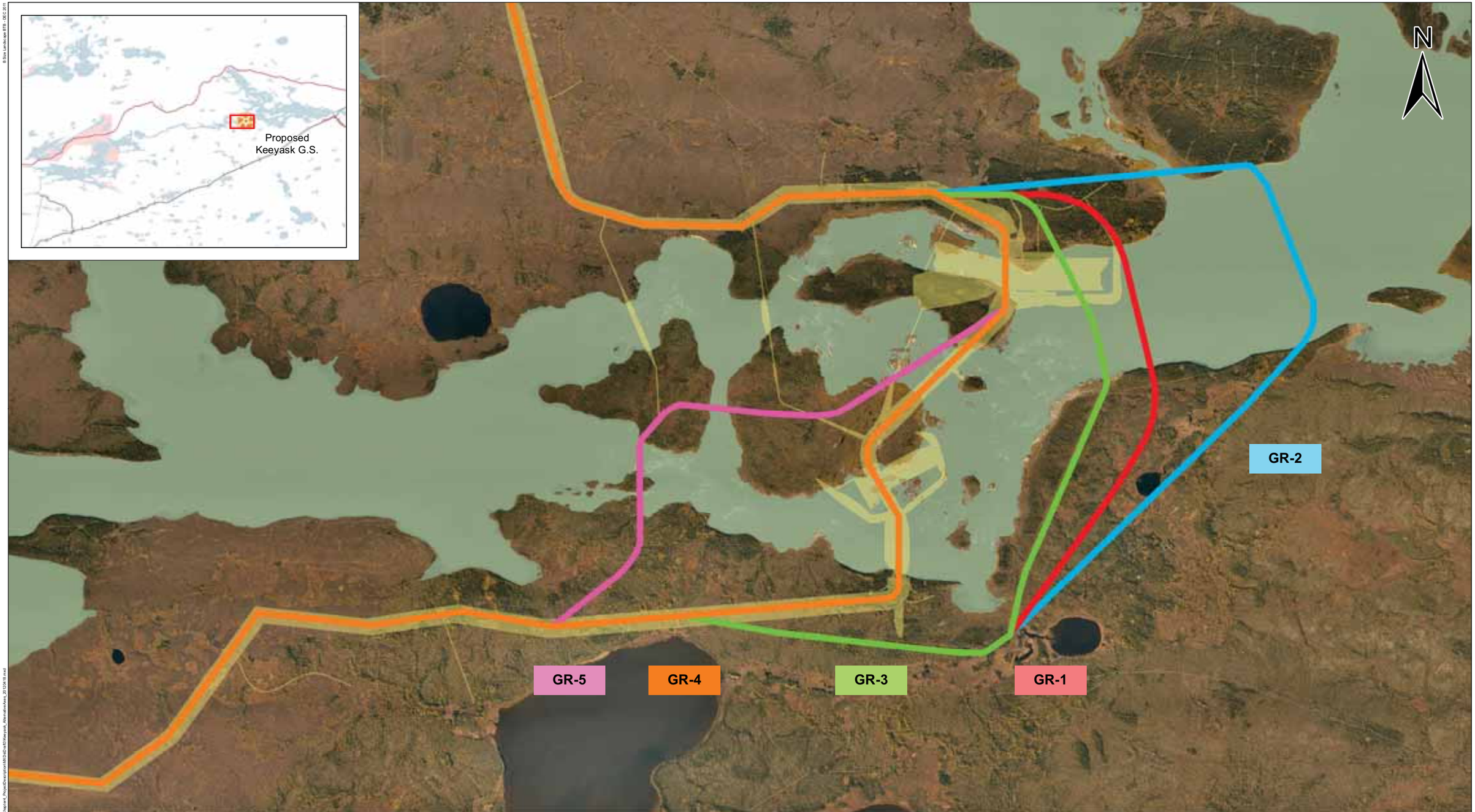
Source : http://www.hydroquebec.com/rupert/en/images/i_shema-sarcelle.gif

KEEYASK
Hydropower Limited Partnership

DATA SOURCE: Manitoba Hydro; Hydro Quebec		
CREATED BY: Manitoba Hydro - Hydro Power Planning - Keeyask & Burntwood Planning		
NOTE(S): Artist's Rendering - Concept Only	DATE CREATED: 17-JAN-12	REVISION DATE: 19-JAN-12
	VERSION NO: 1.0	QA/QC: APPROVED

Vertical Shaft and Bulb Turbine
Cross Sections

Figure 6-1



KEEYASK
Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; Government of Manitoba; Government of Canada

CREATED BY:
Manitoba Hydro - Hydro Power Planning - GIS & Special Studies

COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	12-APR-12	18-APR-12
0 0.25 0.5 Kilometres / 0 0.2 0.4 Miles	VERSION NO: 1.0	QA/QC: APPROVED

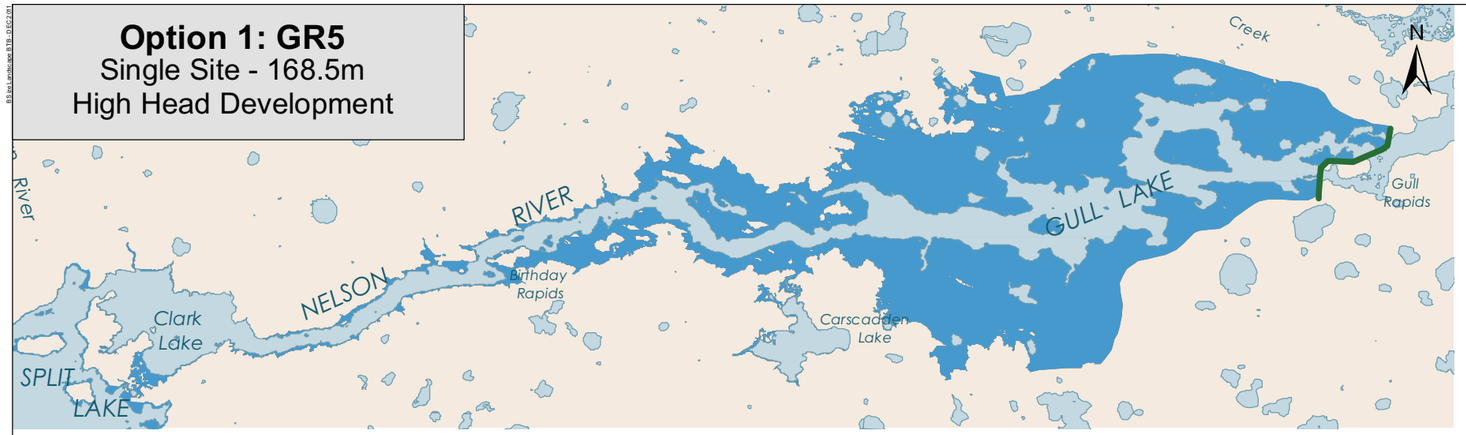
Legend

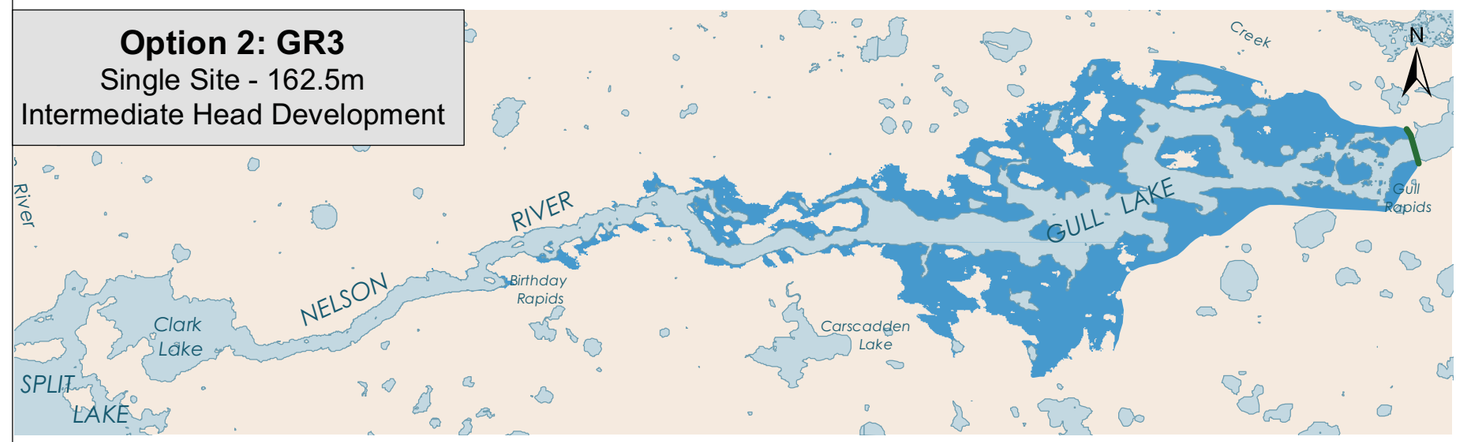
Alternative Axis
- GR-1
- GR-2
- GR-3
- GR-4
- GR-5

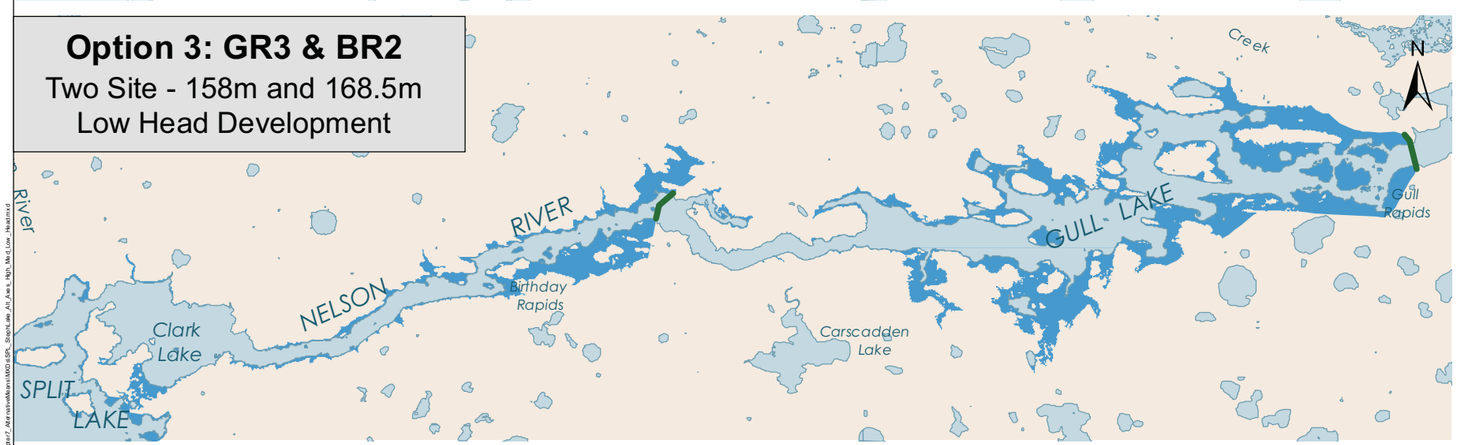
Proposed Infrastructure

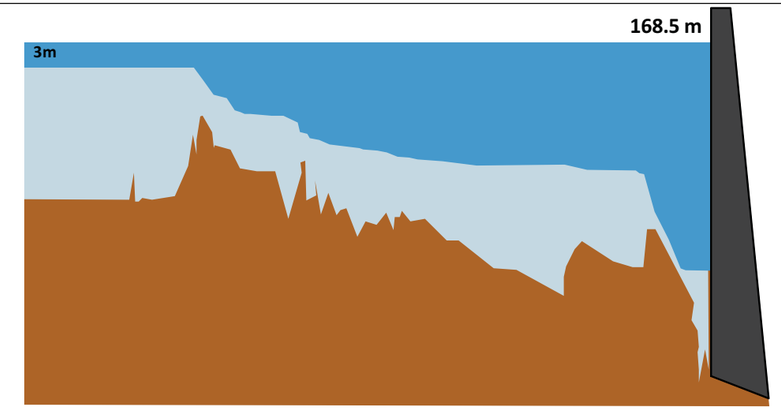
Keeyask Alternative Axes

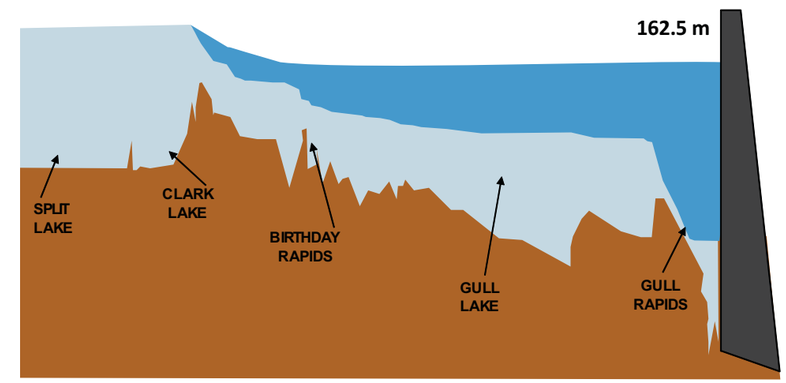
Map 6-1

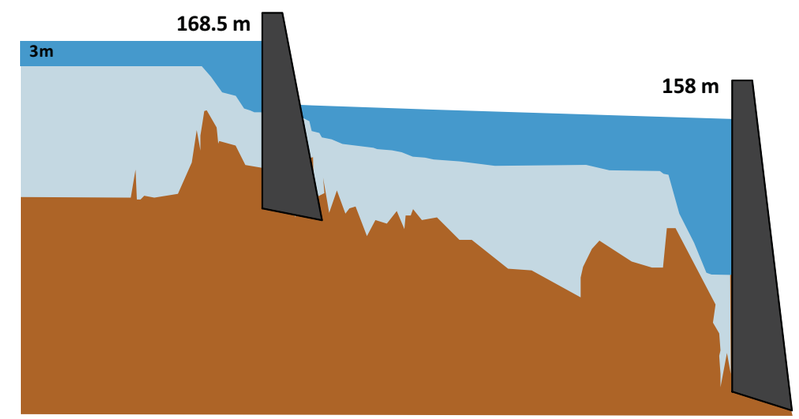












KEEYASK Hydropower Limited Partnership

DATA SOURCE: Manitoba Hydro; Government of Canada, Manitoba Government		
CREATED BY: Manitoba Hydro: Hydro Power Planning Department - GIS & Special Studies		
COORDINATE SYSTEM: UTM NAD 1983 Z15N	DATE CREATED: 19-JAN-12	REVISION DATE: 01-MAR-12
0 1 2 Kilometres / 0 1 2 Miles	VERSION NO: 1.0	QA/QC: APPROVED

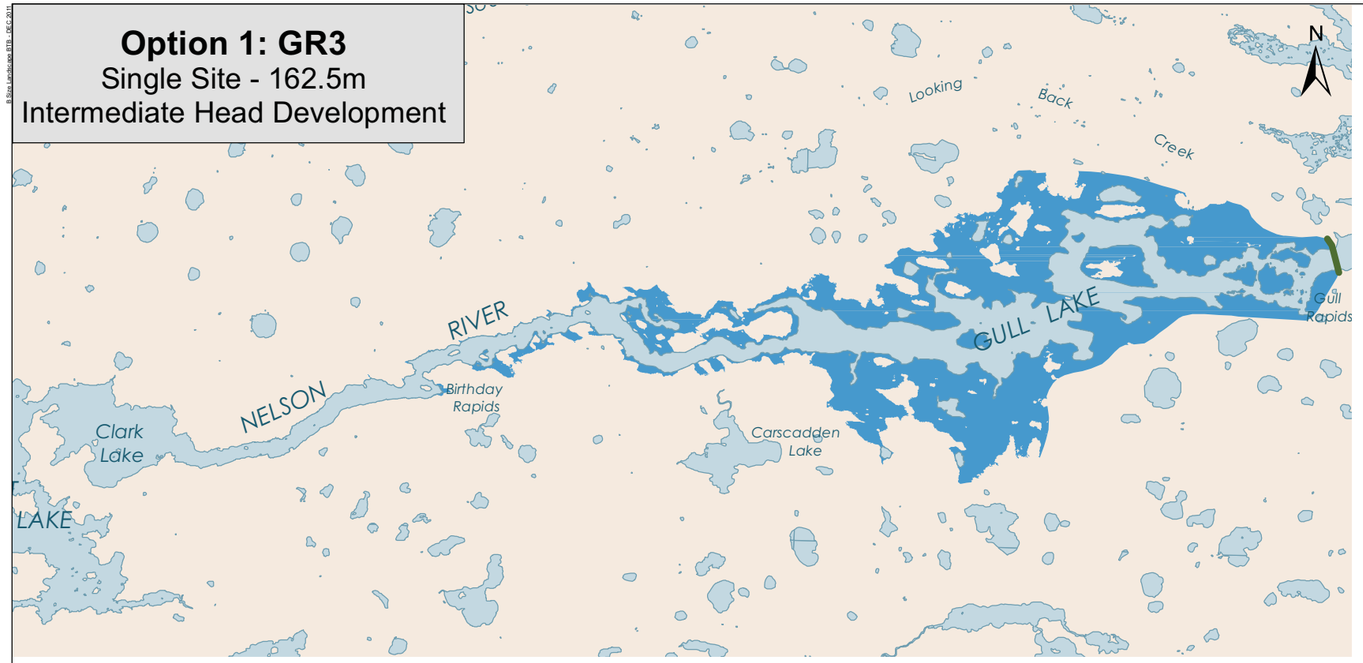
Legend

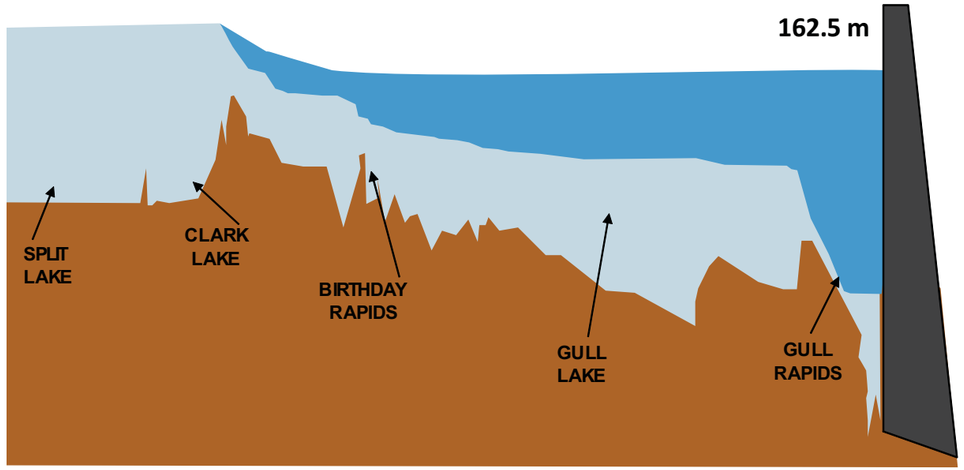
- Generating Station Axis
- Existing Environment Water Level
- Flooded Area
- River Bed

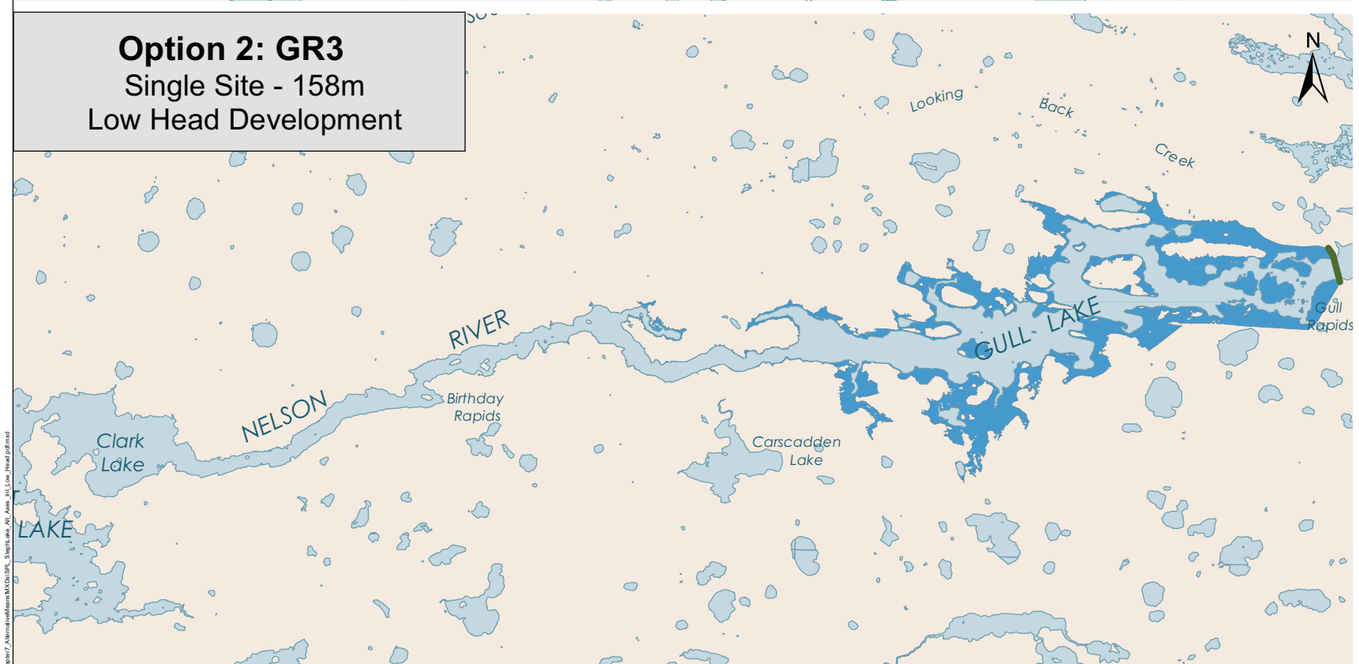
Split Lake to Stephens Lake

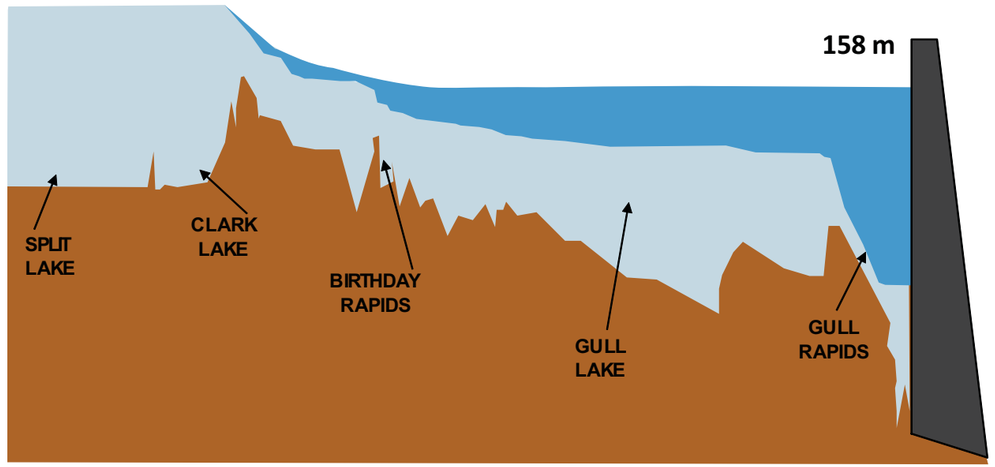
Alternative Axes For High, Intermediate & Low Head Full Reach Development Options

Map 6-2









KEEYASK Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; Government of Canada, Manitoba Government

CREATED BY:
Manitoba Hydro: Hydro Power Planning - GIS & Special Studies

COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	20-JAN-12	27-JAN-12
0 2 4 Kilometres / 0 1.5 3 Miles	VERSION NO: 1.0	QA/QC: APPROVED

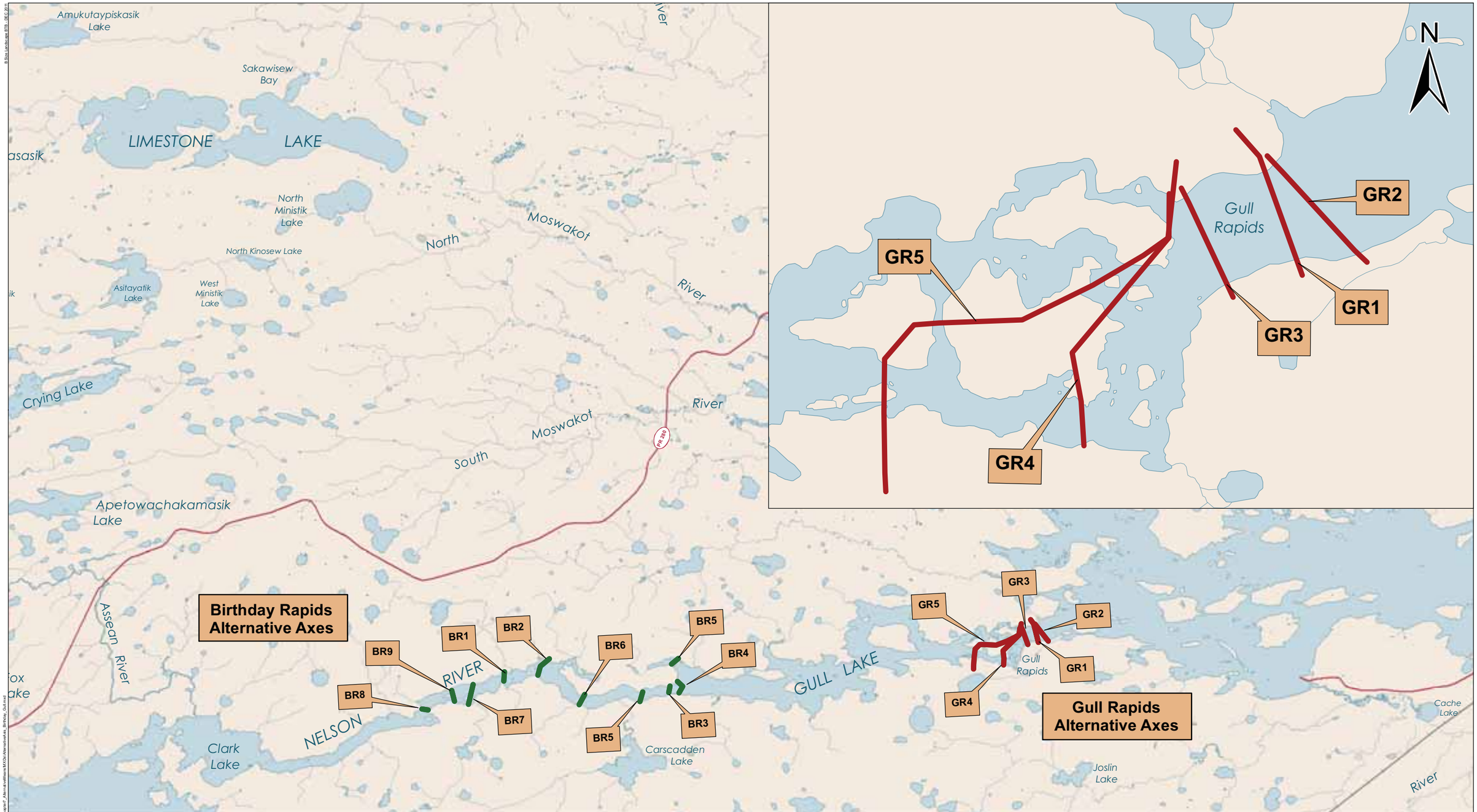
Legend

- Generating Station Axes
- Existing Environment Water Level
- Flooded Area
- River Bed

Split Lake to Stephens Lake

Alternative Axes For Intermediate & Low Head Full Reach Development Options

Map 6-3



KEEYASK Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; Government of Canada; Government of Manitoba

CREATED BY:
Manitoba Hydro - Hydro Power Planning - GIS & Special Studies

COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	18-JAN-12	25-JAN-12
0 2 4 Kilometres / 0 1.5 3 Miles	VERSION NO: 1.0	QA/QC: APPROVED

Legend

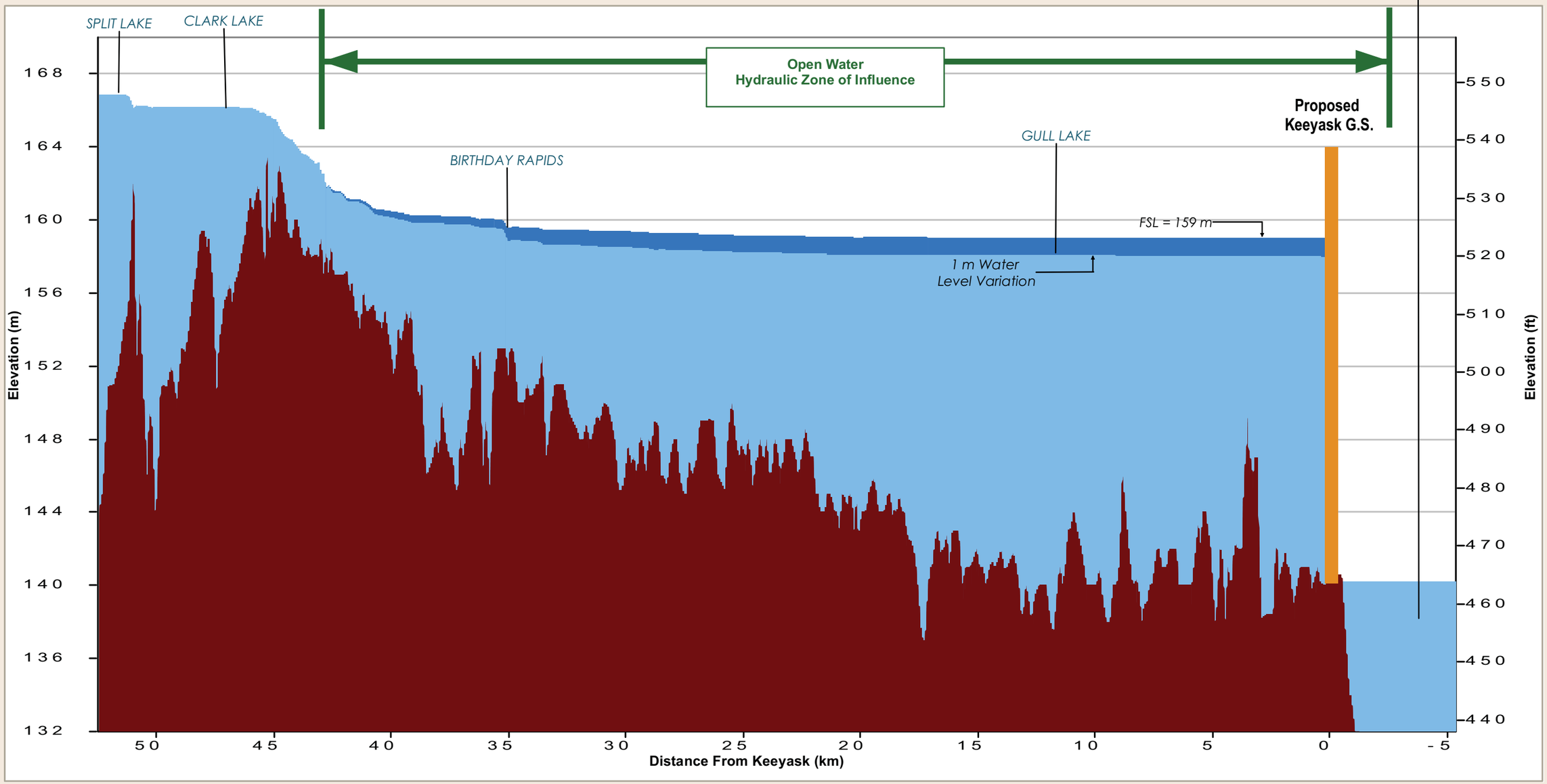
- Birthday Rapids Axes
- Gull Rapids Axes

Alternative Axes

Birthday Rapids and Gull Rapids

Map 6-4

- Water surface profiles shown at 50th percentile flow condition
- Stephens Lake Level = 140.2 m
- Keeyask GS Full Supply Level (FSL) = 159 m
- Keeyask GS Minimum Operating Level (MOL) = 158 m



KEEYASK Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro

CREATED BY:
Manitoba Hydro - Water Resource Engineering - Hydraulic and Ice Studies

NOTE:
Profiles shown at the 50th percentile flow condition and average Stephens Lake water level

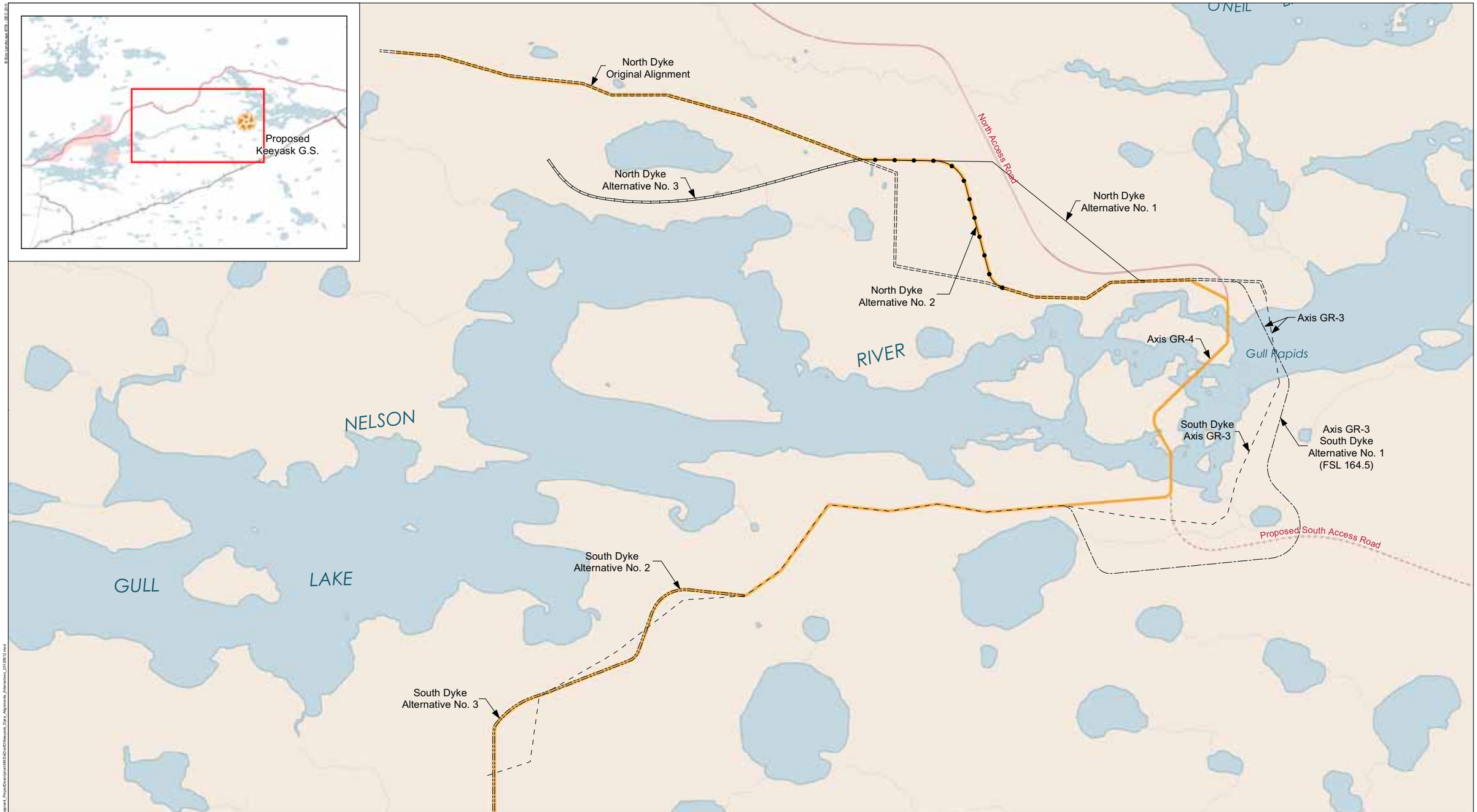
DATE CREATED:	REVISION DATE:
17-JAN-12	20-JAN-12
VERSION NO:	QA/QC:
1.0	APPROVED

Legend

- Maximum Water Level Variations
- Water Level at Keeyask GS Minimum Operating Level (158 m)
- Riverbed

Keeyask Generating Station Reservoir Operating Range

Map 6-5



KEEYASK Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; Government of Manitoba; Government of Canada; KGS Acres Ltd., 2012

CREATED BY:
KGS Acres Ltd. & Manitoba Hydro - HPP

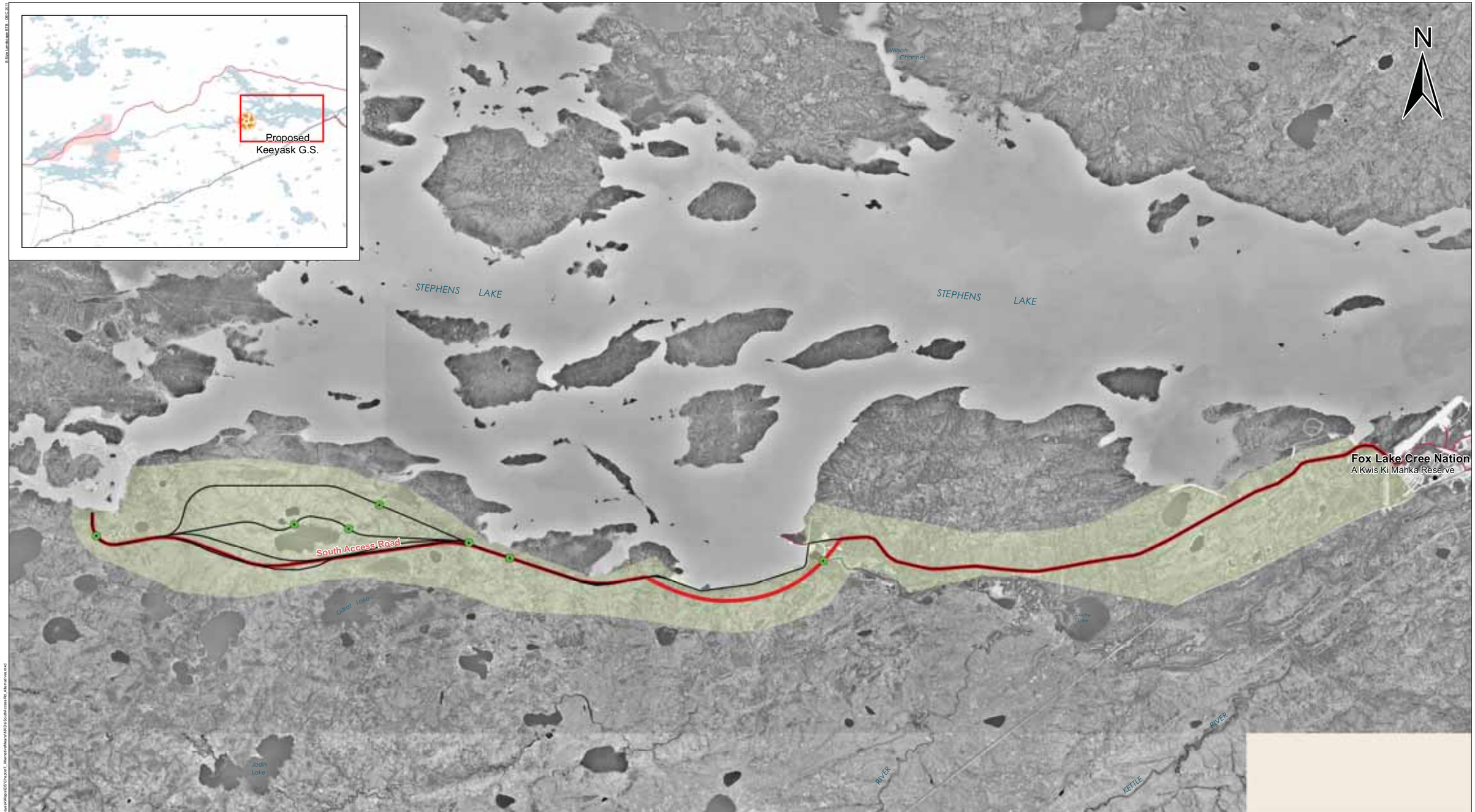
COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	30-JAN-12	12-JUN-12
0 0.5 1 Kilometres / 0 0.4 0.8 Miles	VERSION NO: 1.0	QA/QC: APPROVED

Legend

- North Dyke Original Alignment
- North Dyke Alternative No. 1
- North Dyke Alternative No. 2
- North Dyke Alternative No. 3
- South Dyke Original Alignment
- South Dyke Alternative No. 1
- South Dyke Alternative No. 2 and 3
- Keeyask Principal Infrastructure Axis (Final Alignment)
- North Access Road
- South Access Road
- Rivers
- Waterbody

Dyke Alignment Alternatives

Map 6-6



KEEYASK Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; KGSA, Government of Canada, Government of Manitoba

CREATED BY:
Manitoba Hydro - Hydro Power Planning - GIS & Special Studies

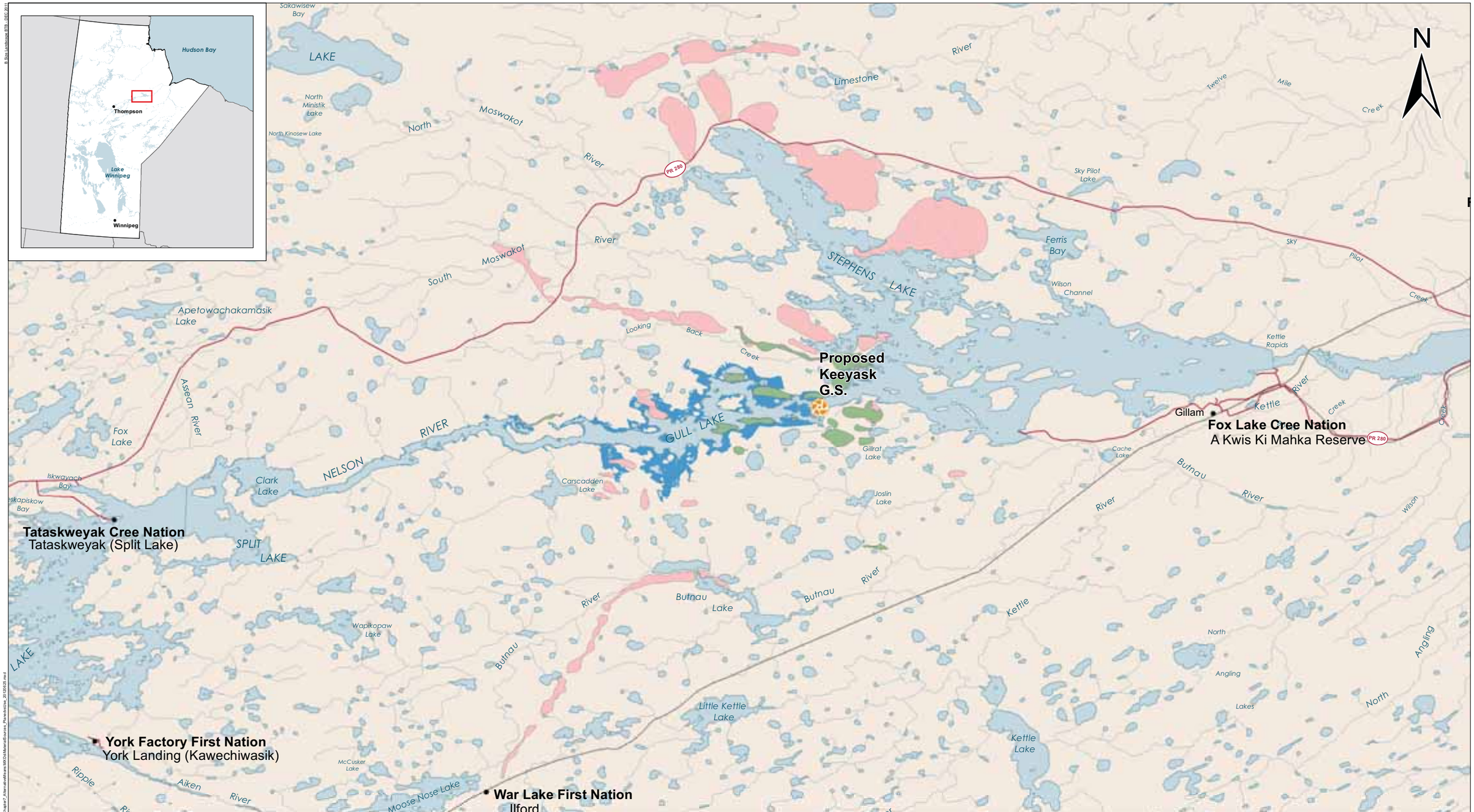
COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	24-JAN-12	12-JUN-12
0 1 2 Kilometres / 0 0.8 1.6 Miles	VERSION NO: 1.0	QA/QC: APPROVED

Legend

- South Access Road Preferred Alignment
- South Access Road Alternatives
- Stream Crossings
- South Access Road Corridor

South Access Road
Alignment Alternatives

Map 6-7



KEEYASK Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; KGSA; Government of Canada; Government of Manitoba

CREATED BY:
Manitoba Hydro - Hydro Power Planning - GIS & Special Studies

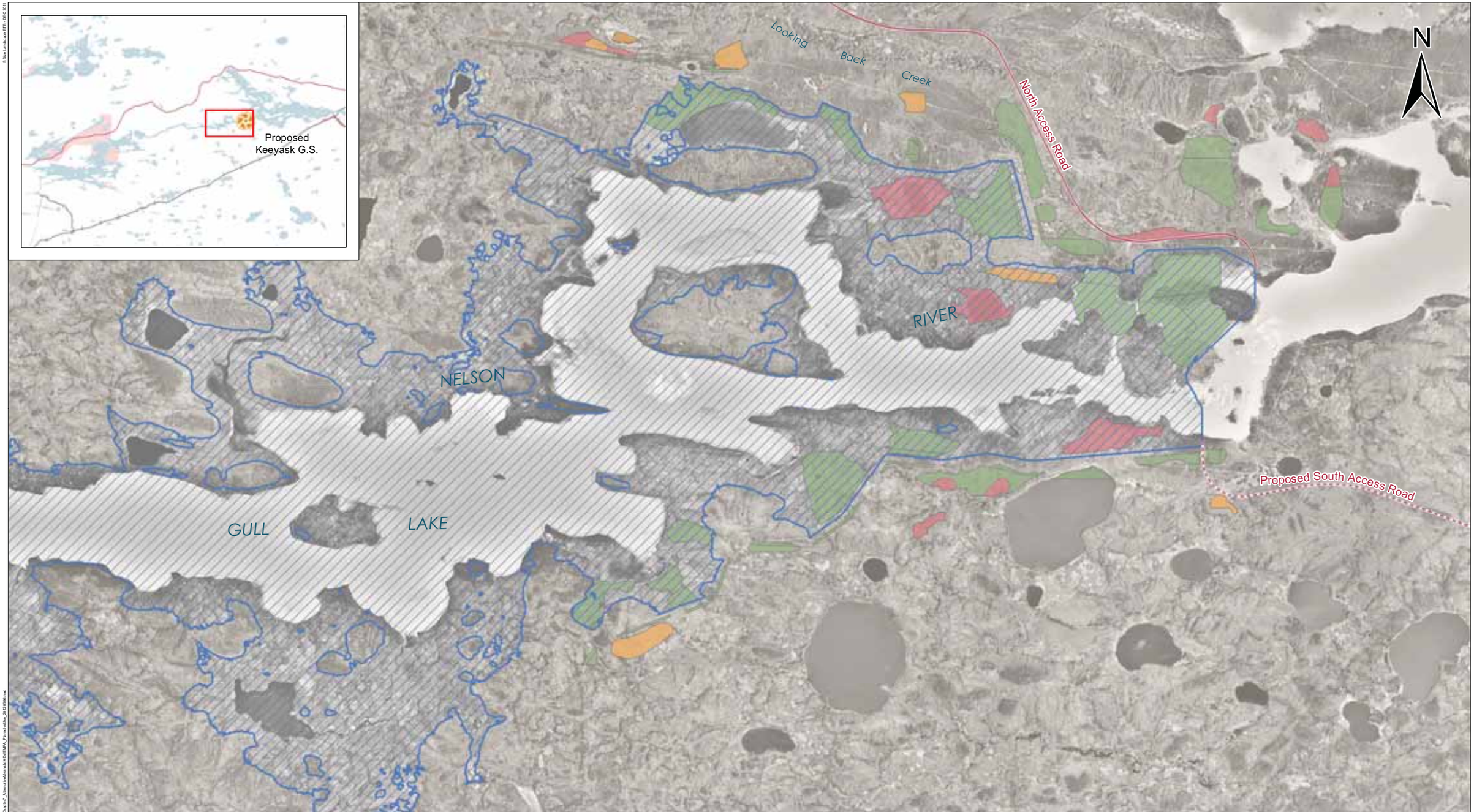
COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	17-JAN-12	25-JUN-12
0 3 6 Kilometres / 0 2.5 5 Miles	VERSION NO: 1.0	QA/QC: APPROVED

Legend

Material Sources
- Material Sources Planned for Use
- Material Sources Available
- Generating Station (Planned)
- Highways
- Rail
- Flooded Area Reservoir (159m)

Alternative Borrow Sources and Quarries

Map 6-8



KEEYASK
Hydropower Limited Partnership

DATA SOURCE:
Manitoba Hydro; Government of Manitoba; Government of Canada; KGS Acreas; Manitoba Hydro 1999 1m Black & White DOI

CREATED BY:
Manitoba Hydro - Hydro Power Planning - GIS & Special Studies

COORDINATE SYSTEM:	DATE CREATED:	REVISION DATE:
UTM NAD 1983 Z15N	09-FEB-12	06-JUN-12
0 0.55 1.1 Kilometres / 0 0.45 0.9 Miles	VERSION NO: 2.0	QA/QC: APPROVED

Legend

Excavated Material Placement Areas
- Will Use
- May Use
- Eliminated

- Initial Flooded Area (159 m)
- Access Road
- Proposed Access Road

Alternative Excavated Material Placement Areas

Map 6-9