

KEEYASK GENERATION PROJECT ENVIRONMENTAL IMPACT STATEMENT

Updates to Project Description Information

June 2013

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KEEYASK GENERATION PROJECT

UPDATES TO PROJECT DESCRIPTION INFORMATION, JUNE 2013

INTRODUCTION

Since the submission of the Response to EIS Guidelines in July 2012 engineering studies have been ongoing resulting in some minor changes to Project information that was submitted in the Response to EIS Guidelines. This document has been submitted so that the public and regulators are fully aware of the changes. As has occurred during all phases of Project design, the potential changes in the Project Description have been provided to the environmental assessment team so that decisions address the potential effects to the various environmental components.

Table 1 provides a brief description of the modifications followed by a description of the impacts to the assessment of effects to the physical, biological (aquatics/terrestrial) and socio-economic (including resource use and heritage) environments provided in the 2012 Response to EIS Guidelines. In general, changes focus on operational workforce estimates and Project footprint area.

OPERATION PHASE WORKFORCE ESTIMATE

The estimated on-site and off-site operation phase staffing requirements for the Keeyask Generation Project were increased as shown in Table 2. The table includes low, average and high estimates to reflect that some staffing requirements are seasonal where more staff are required mainly during the summer period. It is also noted that the workforce for environmental monitoring and waterways management will be highest during the first 10 years of operation and less after 10 years. The total workforce increased from 46 people to 49 (winter) and 80 (summer) with an average of 53 people. It is noted that the minor increase in jobs is driven by the creation of additional employment opportunities for First Nations members.

PROJECT FOOTPRINT

Table 2-1 of the Project Description Supporting Volume is revised as shown in Table 3 and 4 of this document (Table 3 corresponds to Map 1 and 2. Table 4 corresponds to Maps 3 and 4). Table 3 shows the total net effect change for each Project component and Table 4 shows the generalized differences (i.e., to water and land) area. The total overall extent of the Construction Phase Footprint increased by 1.9% or 249 ha and the Operation Phase Footprint increased by 1.1% or 152 ha.

The changes to the footprint resulted from the following:

- Modifications to the alignment of the south access road near the Butnau Dam (Map 5).
- Wetland Enhancement Compensation area along Gull Rapids South creek was added. This increased the footprint by 286 ha, which includes possible disturbed areas (77 ha) to account for additional areas that

may be required for construction, altered water flows (135 ha) accounting for the two lakes located south of the south dyke and the mitigation measure (74 ha) which includes buffers.

- Quarry 7 was expanded. This did not change the footprint total area (Map 6 and 7).
- Boat launch and barge landing areas were refined. This did not change the footprint total area.
- Waste water treatment plant outfall corridor was revised. This did not change the footprint total area.
- Concrete batch plant outfall corridor was revised. This did not change the footprint total area.
- Sensitive areas located in Borrow Area N-6 were removed from the footprint resulting in a decrease of 49 ha to the total footprint area.
- Small areas that had been inadvertently omitted were added to the footprint. This increased the footprint by 42 ha.
- Removal of inadvertent overlapping areas. This decreased the total footprint area by 9 ha in the construction phase and 2 ha in the operation phase.
- The Test Ice Boom access trail corridor for Option B was removed, which resulted in a decrease of 7 ha to the total footprint area.
- The predicted reservoir expansion is 7-8 km² (EIS Section 6.3.7.2), which is relative to the water surface area that is present after the reservoir has been filled to the full supply level (159m) and buoyant peat that moves up with reservoir water is accounted for. The initial flooding boundary in the project footprint includes the approximately 104 ha of peat that rises up with the initial flooding predicted, so it was double counted in the EIS table which included the upper end of the reservoir expansion range to the Project Footprint area. Removing the double counted area in the footprint table resulted in a decrease of 104 ha to the operation phase total footprint area.

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Table 1 – Environmental implications of Project Description Change

Project Description		Implication to Effects Assessment and Mitigation					
Project Component	Description of Change	Physical	Aquatic	Terrestrial	Socio Economic	Resource Use	Heritage Resource
Operation Phase Workforce Estimate	Increases in estimated on-site and off-site staffing requirements for the Keeyask Generation Project as shown in Table 2.	Assessed residual effects (magnitude, extent, frequency, duration) on local air quality and noise is not expected to change as a result of changes in the estimated operation phase work force.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	<p>Further opportunity for KCN operational employment; particularly Fox Lake and TCN, and to a lesser degree YFFN for waterways management, with the greatest increase in the summer</p> <p>Based on the total number of operations jobs and the number likely coming from outside the community it is estimated that 120-150 people would be added to Gillam due to operation employment</p> <p>Given that the majority of the increases are not full-time positions and would not likely represent new people moving into the community, there is little change to Gillam housing, infrastructure and services as compared to what has been filed.</p> <p>Given that the majority are summer season positions, it is not likely that effects on the KCN communities would change in terms of housing, infrastructure and services.</p>	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.
General Footprint	Correction of inadvertent double-counting of several overlapping areas, removal of additional restricted zones near borrow areas and principal structures, and careful reviews to ensure that any small areas omitted from the initial estimation were included in the footprint, if appropriate. See the notes included with Table 3 for further additional explanation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	The removal of restricted zones near borrow areas and principal structures would be a positive change for terrestrial habitat effects.	Not expected to change the residual effects assessments or require any further mitigation.	The revised footprint would have no or negligible effect on each of these components of resource use and would not alter the magnitude, extent, frequency or duration of residual effects.	Not expected to change the residual effects assessments or require any further mitigation.
Wetland Compensation Area	The wetland compensation area along Gull Rapids South creek was added to the	Since only 12 ha of off-system marsh compensation is being developed, the actual	Gull Rapids Creek provides minimal fish habitat;	The wetland compensation increases total area of terrestrial habitat effects. The total amount will depend on how much of the	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require	Not expected to change the residual effects assessments

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Table 1 – Environmental implications of Project Description Change

Project Description		Implication to Effects Assessment and Mitigation					
Project Component	Description of Change	Physical	Aquatic	Terrestrial	Socio Economic	Resource Use	Heritage Resource
	footprint. The addition of the off-system marsh wetland compensation area could increase the total area by approximately 286 ha. Approximately half of this area may potentially be disturbed during the construction of the wetlands and flow improvements in the Gull Rapids South creek.	area affected is expected to be much lower than 286 ha. To the extent this area is actually disturbed, the mitigation involves creating a regionally rare off-system marsh habitat that will replace regionally widespread and relatively abundant wetland types. The area additions do not include any other soil/peatland or surface permafrost sensitivities not already identified for the Project footprint.	changes associated with the wetland enhancement represent a low risk to low value habitat.	<p>approximately 286 ha is actually disturbed.</p> <p>Some of this area was already included in the Project zone of influence on wetlands.</p> <p>To the extent this area is actually disturbed, the mitigation involves creating a regionally rare off-system marsh habitat that will replace regionally widespread and relatively abundant wetland types. The area additions do not include any other rare or otherwise sensitive habitat types not already identified for the Project Footprint. The effects are expected to be temporary. Additionally, the wetland compensation is intended to become an enhancement of existing wetland conditions. Residual effects assessments for all key topics remain the same.</p> <p>As per terrestrial habitat description above, these changes will extend to terrestrial and aquatic mammals, and birds, including potential loss of some bird Species at Risk habitat for the short-term. Depending on how the wetland mitigation enhancements will occur, any drainage considerations to construct high-quality wetlands could involve the temporary removal of beaver and muskrat. Short-term losses/disturbances to enhance long-term habitat gains require consideration for the effects assessment. However, the long-term residual effects assessment would remain the same, and the net compensatory benefit is positive for aquatic mammals.</p>		any further mitigation.	or require any further mitigation.

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Table 1 – Environmental implications of Project Description Change

Project Description		Implication to Effects Assessment and Mitigation					
Project Component	Description of Change	Physical	Aquatic	Terrestrial	Socio Economic	Resource Use	Heritage Resource
Boat Launch and Barge Landing Areas	The boat launch and barge landing areas were updated based on current Stage IV Engineering design.	Not expected to change the residual effects assessments or require any further mitigation.	Habitat changes associated with boat launches and barge landings are small relative to the overall Project and would not affect the assessment conclusions.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.
Extent of waste water treatment plant and concrete batch plant outfall corridor	The location of the waste water treatment plant and concrete batch plant outfall corridors have been identified and are incorporated into the construction phase footprint. The areas were categorized as possibly disturbed areas since the final location of the outfalls are yet to be finalized.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.
Quarry 7	The extent of Quarry 7 has been expanded because the rock in that portion of the north channel of Gull Rapids may not have the quality required for concrete coarse aggregate. Rock in other portions of Gull Rapids are likely to be suitable for concrete coarse aggregate.	Not expected to change the residual effects assessments or require any further mitigation. While the revised footprint of Quarry Q7 is larger than what was assessed in the EIS this area was already part of the Project's assessed footprint.	Not expected to change the residual effects assessments or require any further mitigation because this is within the planned cofferdam.	Not expected to change the residual effects assessments or require any further mitigation because this area was already considered in the assessment. No issues for mammals or habitat as described above. No issues for birds or amphibians.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation. The area included in the revised quarry areas was previously considered as part of the HRIA.
Borrow Source Areas	The borrow sources and quarries map has been updated to reflect the extension to Quarry Q-7. This map also reflects that	Quarry Q7 would be larger, however the area covered was already part of the assessed project footprint. Borrow Areas N-6 would	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation because these areas were already considered in the assessment.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation.

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Table 1 – Environmental implications of Project Description Change

Project Description		Implication to Effects Assessment and Mitigation					
Project Component	Description of Change	Physical	Aquatic	Terrestrial	Socio Economic	Resource Use	Heritage Resource
	the extent of borrow N-6 has been reduced to avoid impacting sensitive areas.	decrease in size, therefore the area considered in the EIS is larger than what will actually be affected.					
South Access Road Alignment	The south access road alignment was modified to optimize the horizontal geometry and to avoid a saturated area that exists northeast of the Butnau Weir. Other considerations included to safely locate the turnoff to the Butnau Marina at a sufficient distance, while still maintaining Manitoba Infrastructure and Transportation Geometric Design Criteria.	Not expected to change the residual effects assessments or require any further mitigation. Realignment of the south access road represents a minor alteration to the Project footprint. The total affected land area is approximately 14 ha less in the revised alignment. The revised alignment and the alignment assessed in the EIS pass through the same soil/peatland and permafrost types.	Changes to the alignment of the south access road will affect local streams; these will be assessed when applications are made for the stream crossings.	Not expected to change the residual effects assessments or require any further mitigation given the very small area and lack of highly sensitive terrestrial habitat types. The route was previously aligned with considerations for avoiding caribou calving complexes. These small adjustments do not change the conclusions of the effects assessment.	Not expected to change the residual effects assessments or require any further mitigation.	Not expected to change the residual effects assessments or require any further mitigation. There will be a minor safety benefit for resource users using the Butnau Marina.	Not expected to change the residual effects assessments or require any further mitigation.

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Table 2 – Revised Estimated Keeyask GS Operating Staff Requirements

	2012 Response to EIS Guidelines	Revised			Comments
		Min	Average	Peak	
Staff Located at Keeyask Project					
Plant Manager	1		1		No change
Administration Representative	1		1		No change
Supervisor - Electrical	1		1		No change
Supervisor – Mechanical	1		1		No change
Power Supply Worker - Electrical	8		8		No change
Power Supply Worker – Mechanical	8		8		No change
Planner	1		1		No change
Engineering Technician	1		1		No change
Store Keeper	1		1		No change
Utility Workers	4		4		No change
Welder	1		1		No change
Janitor	1		1		No change
Apprentice - Electrical	4		4		No change
Apprentice - Mechanical	4		4		No change
Apprentice - Utility	0		1		Addition
Sub-Total	37		38		
Staff Located Along Lower Nelson River					
Engineering – Mechanical	1		1		No change
Engineering – Electrical	1		1		No change
Engineering – Civil	1		1		No change
Engineering – Geotechnical	0		0.5		New
Engineering - Technical Assistant	0		1		New
IT/Communications/Testing	1		0.25		Reduced from 1.0
Operational Training Support	0		0.5		New
Employee Retention Support	0		0.5		New
Gillam Services - Trades	3		3		No change
Community Liaison	0		0.25		New

Table 2 – Revised Estimated Keeyask GS Operating Staff Requirements

	2012 Response to EIS Guidelines	Revised			Comments
		Min	Average	Peak	
Environmental Specialist	0		0.25		New
Waterways Management / Safe Winter Trails / Environmental Mitigation Support	2	2	5	25	Increased from 2
Environmental Monitoring	0	0	1	8	New
Sub-Total	9	11.25	15.25	42.25	
Total	46	49.25	53.25	80.25	

Table 3 – Revised Summary of Lands Required (Project Description Supporting Volume Table 2-1)

Footprint Components	Table 2-1 – July 2012 [ha]		Table 2-1 – Revised [ha]		Difference		Percent of Difference	
	Construction Phase	Operation Phase	Construction Phase	Operation Phase	Construction Phase	Operation Phase	Construction Phase	Operation Phase
Roads ^{3, 13, 15}	621	638	607	618	(13.65)	(20.48)	-2%	-3%
Road Corridors ^{14, 15}	122	119	71	69	(51.23)	(50.23)	-42%	-42%
Infrastructure ^{7, 10}	317	208	317	214	(0.37)	6.23	0%	3%
River Management ⁹	27	1	27	-	(0.12)	(1.00)	0%	-100%
Borrow Areas ^{4,11}	1,321	1,052	1,377	1,004	55.51	(48.49)	4%	-5%
Camp and Work Areas	154	154	153	153	(0.70)	(0.70)	0%	0%
Excavated Material Placement Area	181	99	181	99	0.20	0.47	0%	0%
Mitigation and Compensation Area ^{2, 12}	133	-	201	74	68.29	74.38	51%	100%
Possibly Disturbed Area ^{1, 11, 15, 17}	672	219	1,745	1,314	1,073.34	1,094.77	160%	500%
Reservoir Clearing ¹²	3,602	-	3,529	-	(73.20)	0.00	-2%	0%
Areas Unlikely to be Used ^{5, 15}	945	936	-	-	(945.00)	(936.00)	-100%	-100%
Altered Water Area ^{8, 13}	5,161	5,038	5,296	5,173	135.07	135.45	3%	3%
Dewatered Area ^{7, 13, 16}	100	100	101	102	0.89	2.27	1%	2%
Flooded Area ¹³	-	4,463	-	4,463	0.00	(0.22)	0%	0%
Reservoir Expansion (First 30 Years) ⁶	-	800	-	696	0.00	(104.50)	0%	-13%
Total Construction/Operating Phase	13,356	13,827	13,605	13,979	249.04	151.96	2%	1%

Notes:

1. Difference due to Areas Coded are "Areas Unlikely to be Used" changed to Possible Disturbed Area, Possible Disturbed Areas added around GS (for construction reasons), and PDA area added around wetland enhancement area

2. Difference due to refinement of Wetland Enhancement Area

3. Difference due to refinement of South Access Road

4. Difference due to Identified Sensitive Area removed from N-6

5. Areas Unlikely to be Used changed to Possible Disturbed Area

6. Reservoir Expansion (First 30 Years) is actually 696 ha, but published as the maximum expected area of 800 ha

7. Difference due to areas coded as Dewatered Areas recoded as Infrastructure

8. Difference due to 2 small lakes added due to effects possibly caused by Wetland Enhancement

9. Difference due to area coded as River Management in Operation changed to Infrastructure

10. Difference due to Barge Landing near B-1 being added to the footprint

11. Difference due to Q-7 extension area being added

12. Difference due to small changes in the Whitefish and Walleye Habitat Shoal Locations

13. Difference due to small changes in the Boat Launch and Barge Landing Infrastructure and Portage/Access Route Alignment

14. Difference due to Test Ice Boom Option B Access Corridor being removed

15. Difference due to overlapping polygons in the EIS July 2012 GIS Dataset

16. Difference due to overlapping polygons in the EIS July 2012 GIS Dataset and Features Overlay Method

17. Difference due to small Footprint area gaps filled as Possibly Disturbed Area

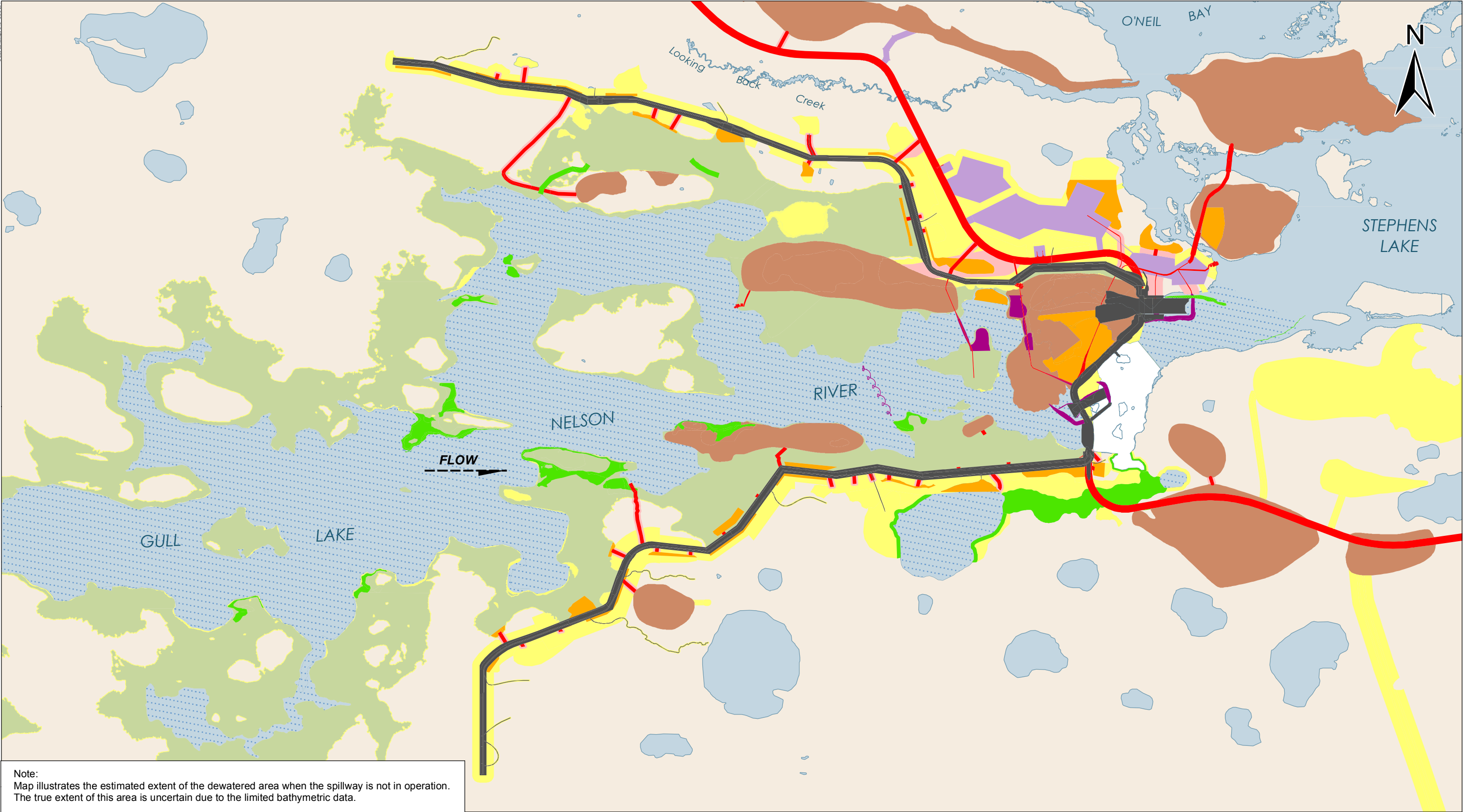
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Table 4 – General Footprint Categories

Footprint - Categories	Area (ha) *		Percent of Footprint	
	Construction Phase	Operation Phase	Construction Phase	Operation Phase
Altered Water Footprint Area	5,296	5,173	38.93%	37.01%
Planned Disturbed Footprint Area	6,462	7,389	47.50%	52.86%
Possibly Disturbed Footprint Area ¹	1,847	1,416	13.57%	10.13%
<i>Total</i>	<i>13,605</i>	<i>13,979</i>	<i>100.00%</i>	<i>100.00%</i>

1. Includes Possibly Disturbed and Dewatered Footprint Components areas outlined in Table 3.

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Note:
Map illustrates the estimated extent of the dewatered area when the spillway is not in operation.
The true extent of this area is uncertain due to the limited bathymetric data.



DATA SOURCE:
Manitoba Hydro; Government of Manitoba;
Government of Canada; ECOSTEM; Manitoba Hydro Keeyask GS Footprint
20130422

CREATED BY:
Hydro Power Planning - Keeyask & Burntwood Planning Section

COORDINATE SYSTEM:
UTM NAD 1983 Z15N

DATE CREATED:
18-JAN-12

REVISION DATE:
11-JUL-13

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0 0.45 0.9 Miles

VERSION NO:
3.0

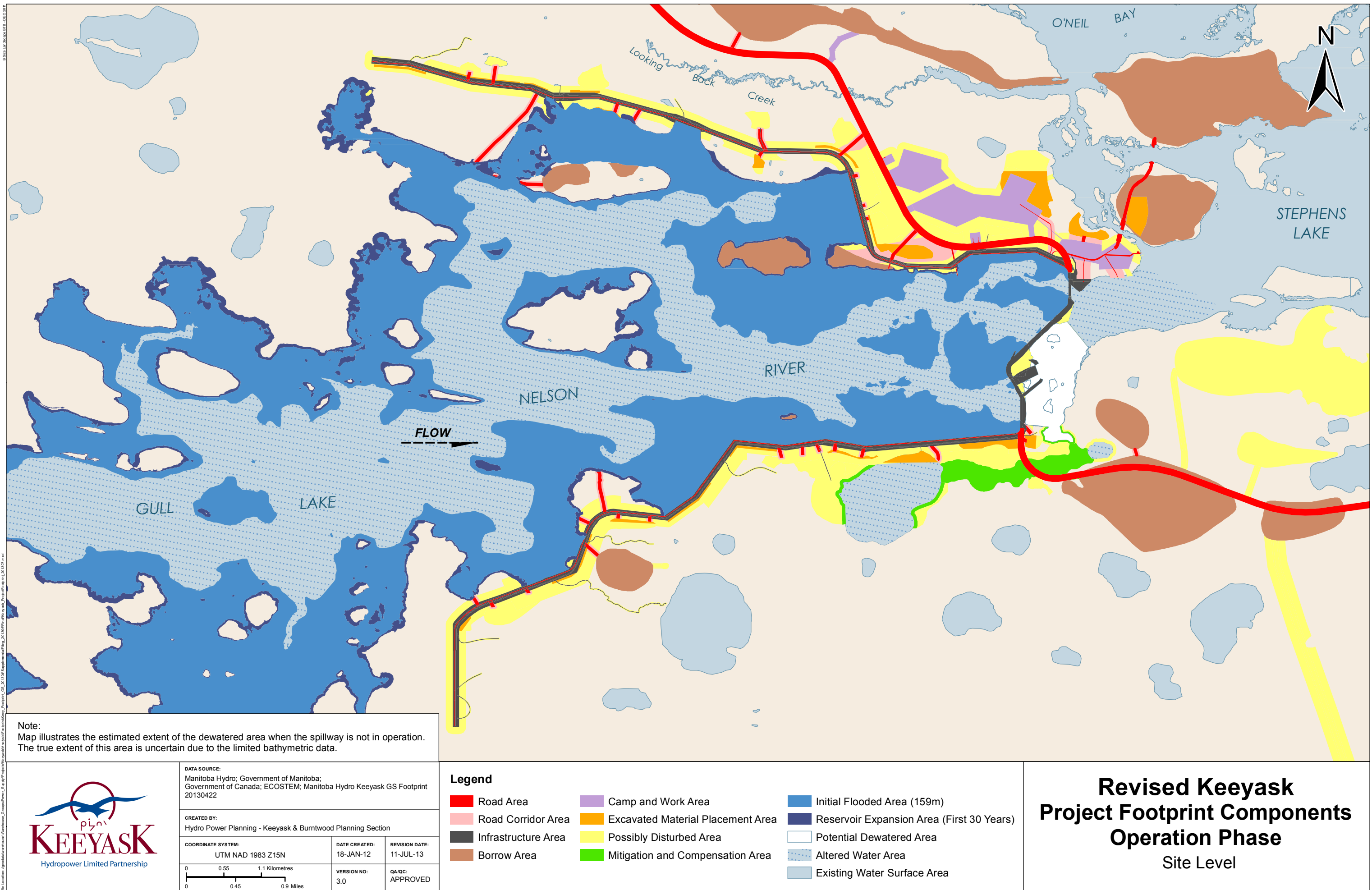
QA/QC:
APPROVED

Legend

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| Road Area | Borrow Area | Possibly Disturbed Area |
| Road Corridor Area | Camp and Work Area | Reservoir Clearing Area |
| Infrastructure Area | Excavated Material Placement Area | Potential Dewatered Area |
| River Management Area | Mitigation and Compensation Area | Altered Water Area |
| | | Existing Water Surface Area |

**Revised Keeyask
Project Footprint Components
Construction Phase
Site Level**

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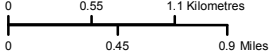
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Map illustrates the estimated extent of the dewatered area when the spillway is not in operation.
The true extent of this area is uncertain due to the limited bathymetric data.



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18-JAN-12

VERSION NO:
3.0

REVISION DATE:
11-JUL-13

QA/QC:
APPROVED

Legend

Footprint Areas

- Planned Disturbed Footprint Area
- Possibly Disturbed Footprint Area
- Altered Water Footprint Area
- Existing Water Surface Area

**Revised Keeyask
Project Footprint
Construction Phase
Site Level**

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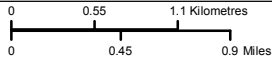
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Map illustrates the estimated extent of the dewatered area when the spillway is not in operation.
The true extent of this area is uncertain due to the limited bathymetric data.



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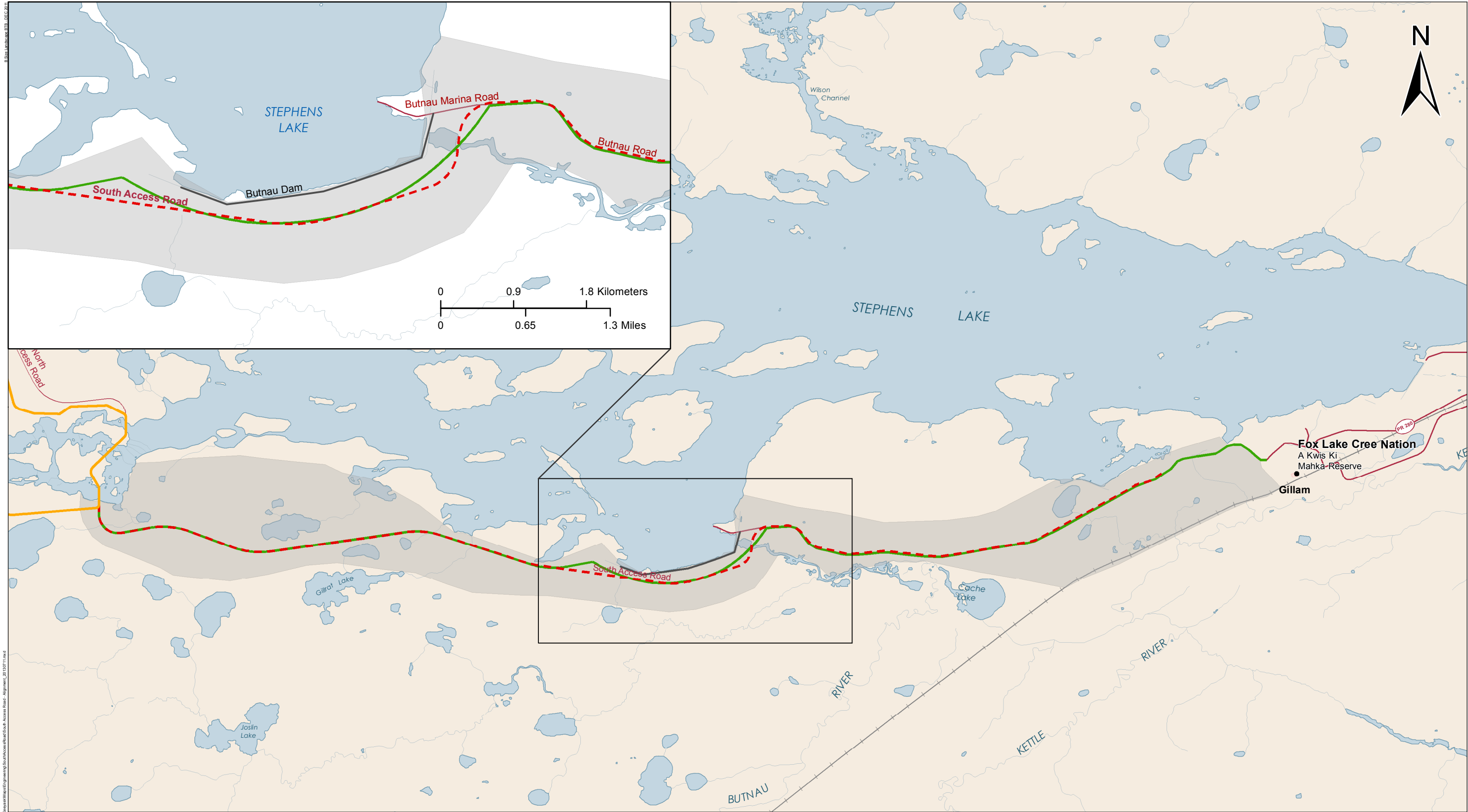
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Footprint Areas

- Planned Disturbed Footprint Area
- Possibly Disturbed Footprint Area
- Altered Water Footprint Area
- Existing Water Surface Area

**Revised Keeyask
Project Footprint
Operation Phase**
Site Level

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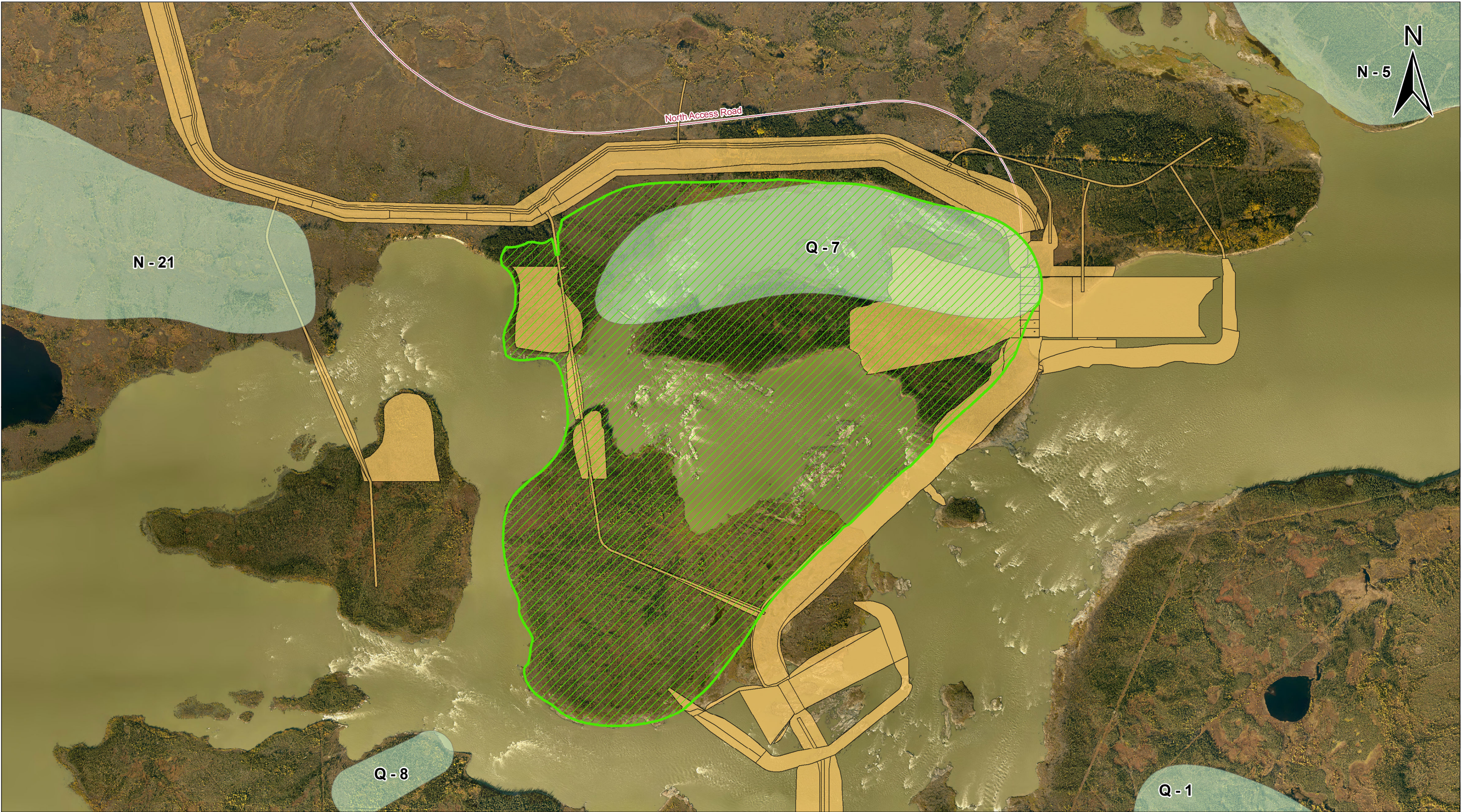
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- South Access Road - Current Alignment
- South Access Road - Presented in EIS
- South Access Road Corridor
- Butnau Dam
- Keeyask Principal Structures

**Revised Keeyask
South Access Road
Alignment**




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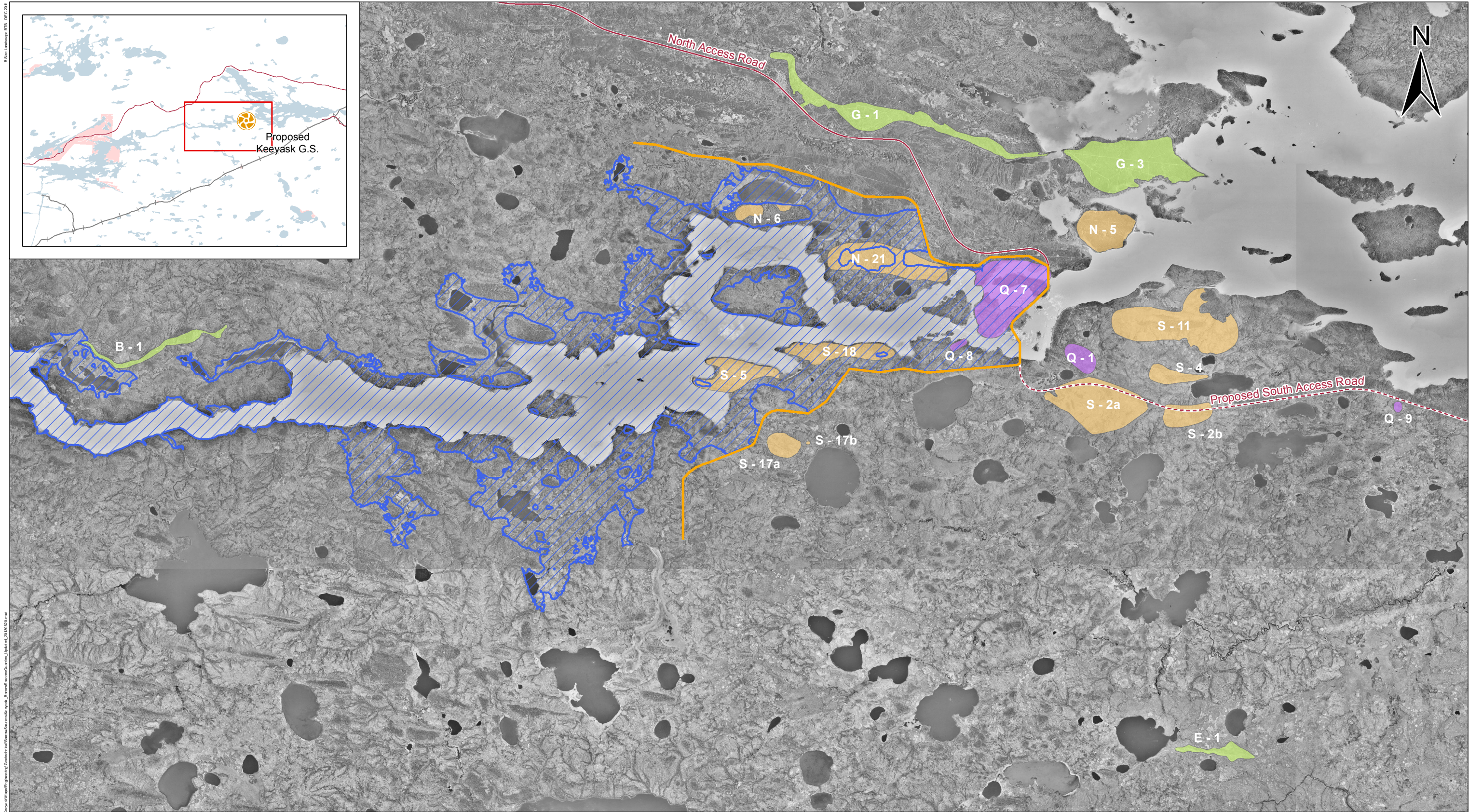
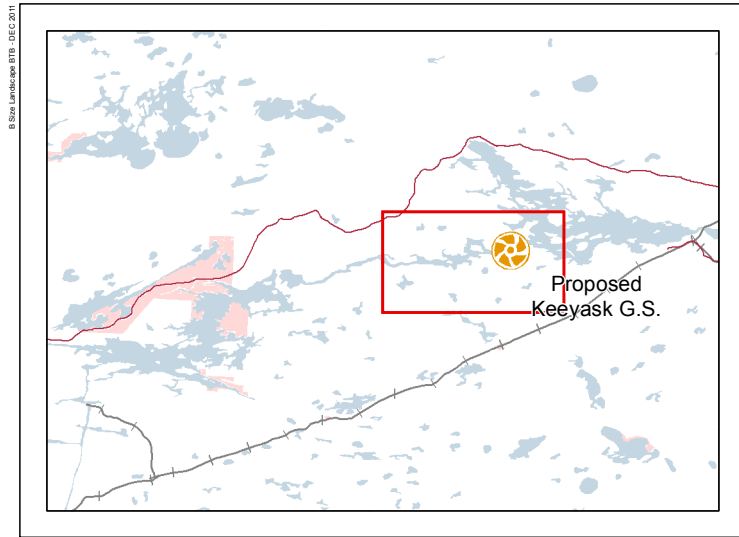
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Legend

-  Proposed Q-7 Extension
-  Borrow Source
-  Infrastructure

**Revised
Extent of Quarry 7**

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Legend

Material Sources

- Granular Borrow
- Impervious Borrow
- Rock Quarry

- Access Road
- Proposed Access Road
- Keeyask Principal Structures
- Initial Flooded Area (159 m)

Revised Keeyask Borrow Sources and Quarries Potential

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