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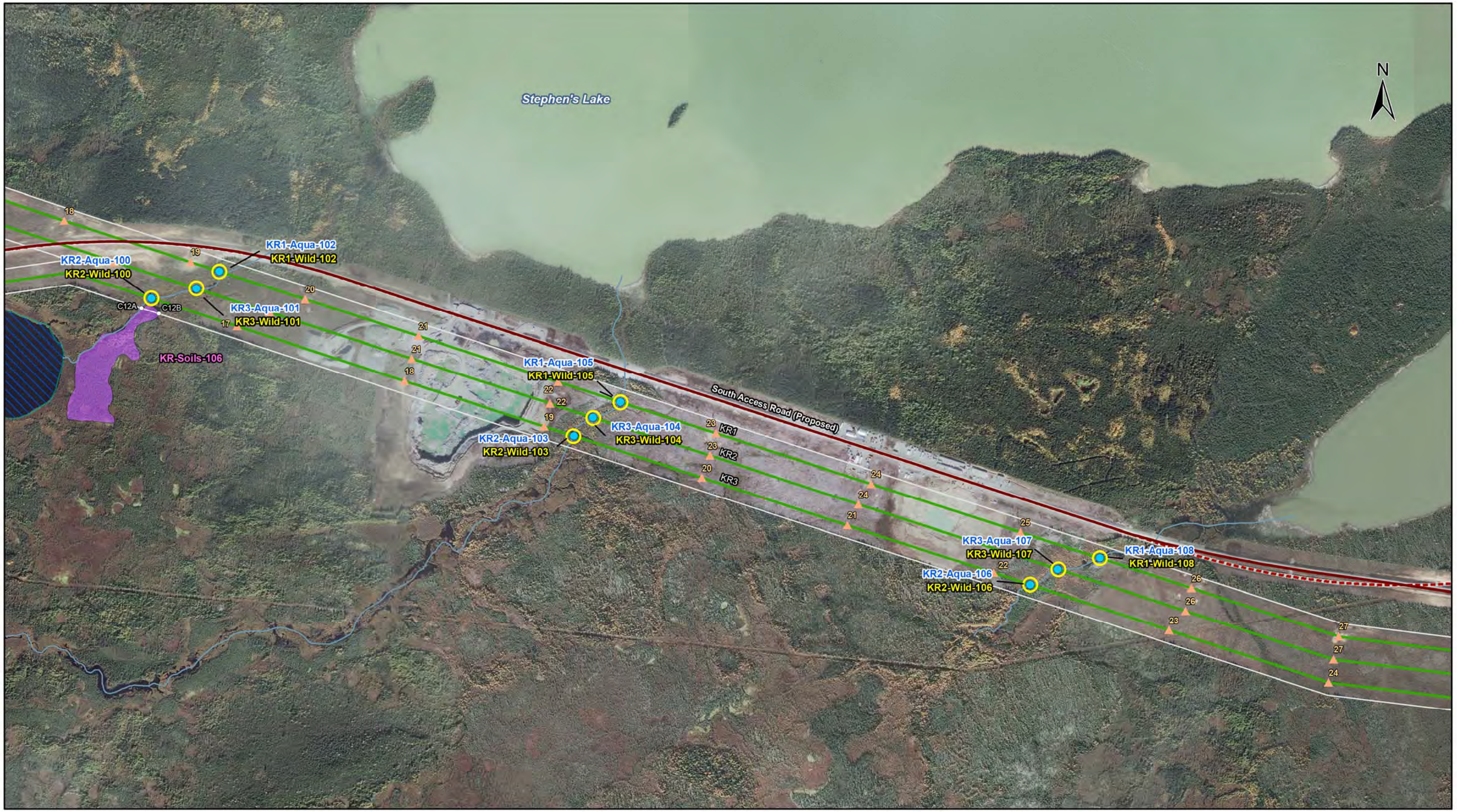

Manitoba Hydro

Coordinate System: UTM Zone 15N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: December 13, 2016
Version: Final 4.0

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Metres

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Land Base
- Bipole I and II
- Transmission Line
- Proposed Roads
- Active Railway
- Abandoned Railway

Project Infrastructure
- Towers (Preliminary)*
- Generation Outlet Transmission Line
- Project Footprint (ROW)
- Access Route

*Towers are subject to change, and are only use as a rough guide

ESS Features
- Archaeological Site
- Historical
- Water Crossing
- Birds and Habitat
- Mammals and Habitat
- Marsh Habitat
- Water and Wetland Habitat
- Permafrost

Keeyask Transmission Project
Construction Environmental Protection Plan

Environmentally Sensitive Site Locations

Unit (KR) Lines

Map 8

ESS Group: Water Crossing

Sec-ID	ESS ID	ESS Name	Easting	Northing	UTM Zone	Channel Width	Wet Width	Fish Habitat Class	Habitat Sensitivity
KR2	KR-Aqua-100	Unnamed Tributary	371556	6244280	15N	N/A	N/A	N/A	N/A
KR3	KR-Aqua-101	Unnamed Tributary	371691	6244305	15N	N/A	N/A	N/A	N/A
KR1	KR-Aqua-102	Unnamed Tributary	371759	6244351	15N	N/A	N/A	N/A	N/A
KR2	KR-Aqua-103	Unnamed Tributary	372731	6243897	15N	N/A	N/A	N/A	N/A
KR3	KR-Aqua-104	Unnamed Tributary	372783	6243948	15N	N/A	N/A	N/A	N/A
KR1	KR-Aqua-105	Unnamed Tributary	372859	6243992	15N	N/A	N/A	N/A	N/A
KR2	KR-Aqua-106	Unnamed Tributary	373993	6243485	15N	N/A	N/A	N/A	N/A
KR3	KR-Aqua-107	Unnamed Tributary	374072	6243528	15N	N/A	N/A	N/A	N/A
KR1	KR-Aqua-108	Unnamed Tributary	374190	6243558	15N	N/A	N/A	N/A	N/A

Potential Effects:

Habitat loss & contamination from structure foundations & installations; Increased erosion & sedimentation of streams; Damage to stream banks; Loss of riparian vegetation; Fish habitat disturbance & impeded fish movement; Rutting of floodplain

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
- Use existing trails, roads or cut lines whenever possible as access routes
- Identify and flag buffer areas prior to start of work
- Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. Within these buffers shrub and herbaceous understory veg will be maintained along with trees that do not violate MH Veg Clearance Requirements
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing

ESS Group: Permafrost

Sec-ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
IN ROW	KR-Soils-106	Permafrost-Extensive Discontinuous	Site: C12A to C12B	E-371531 N-6244251	E-371579 N-6244236	15N	50 m

Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting
- Use existing trails, roads or cut lines whenever possible as access routes
- Avoid organic soils containing permafrost to the extent possible
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

ESS Group: Birds and Habitat

Sec-ID	ESS ID	ESS Name	Easting	Northing	UTM Zone
KR1	KR-Wild-100	Unnamed Tributary	371556	6244280	15N
KR3	KR-Wild-101	Unnamed Tributary	371691	6244305	15N
KR2	KR-Wild-102	Unnamed Tributary	371759	6244351	15N
KR1	KR-Wild-103	Unnamed Tributary	372731	6243897	15N
KR3	KR-Wild-104	Unnamed Tributary	372783	6243948	15N
KR2	KR-Wild-105	Unnamed Tributary	372859	6243992	15N
KR1	KR-Wild-106	Unnamed Tributary	373993	6243485	15N
KR3	KR-Wild-107	Unnamed Tributary	374072	6243528	15N
KR2	KR-Wild-108	Unnamed Tributary	374190	6243558	15N

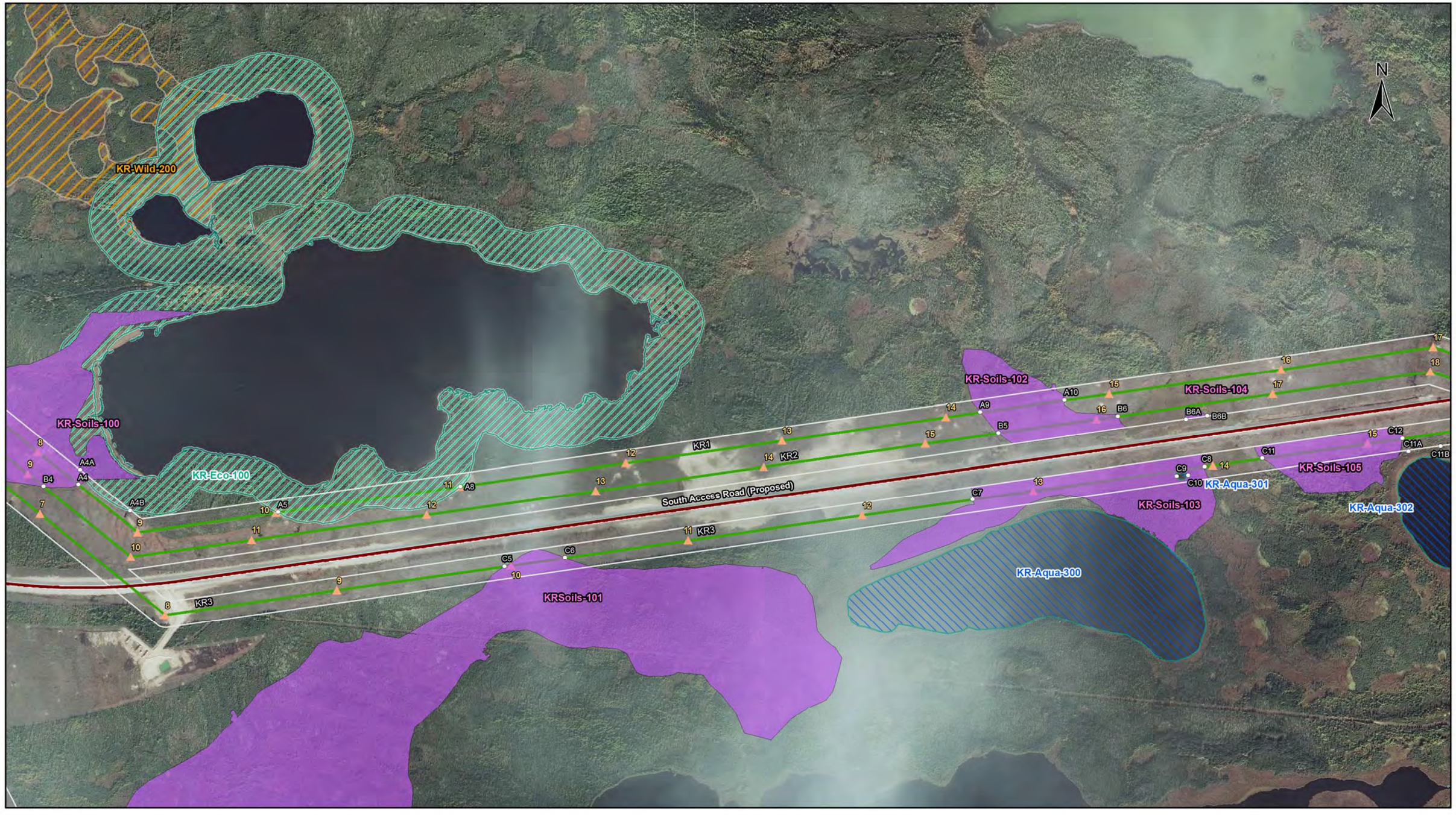
ESS Group: Birds and Habitat continued

Potential Effects:

Potential loss of SAR habitat; Higher risk of wire collision within the ROW

Specific Mitigation:

- Adhere to reduced risk timing windows for protection of birds (August 1- April 30)
- Maintain applicable setback during nesting and breeding timing window
- Conduct priority assessment for bird diverters and other measures prior to transmission line stringing
- Install bird diverters or other measures at high priority sites



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- Abandoned Railway

Project Infrastructure
- Towers (Preliminary)*
- Generation Outlet Transmission Line
- Project Footprint (ROW)
- Access Route

*Towers are subject to change, and are only use as a rough guide

ESS Features
- Archaeological Site
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- Water Crossing
- Birds and Habitat
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- Marsh Habitat
- Water and Wetland Habitat
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Keeyask Transmission Project
Construction Environmental Protection Plan

Environmentally Sensitive Site Locations

Unit (KR) Lines

Map 9

ESS Group: Habitat

Sec-ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
KR1	KR-Eco-100	Off-system marsh and marsh environment	Site: A4A to A4B	E-367358 N-6244222	E-367497 N-6244108	15N	180 m
KR1	KR-Eco-100	Off-system marsh and marsh environment	Site: A6 to A8	E-367906 N-6244102	E-368413 N-6244175	15N	509 m

Potential Effects:

Remove or alter particularly important wetland type

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
- Provide 30 m vegetated (shrub and herbaceous) buffer around site
- Remove trees by low-disturbance methods within buffer
- The application of herbicides is prohibited within buffer

ESS Group: Wetland

Sec-ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
IN ROW	KR-Aqua-300	Wetland					
KR2	KR-Aqua-301	Wetland	Site: C9 to C10	E-370404 N-6244204	E-370436 N-6244207	15N	32 m
IN ROW	KR-Aqua-302	Wetland					

Potential Effects:

Increased erosion and sedimentation of streams; rutting of floodplains, loss of riparian vegetation

Specific Mitigation:

- Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. Within these buffers shrub and herbaceous understory veg will be maintained along with trees that do not violate MH Veg Clearance Requirements
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing

ESS Group: Permafrost

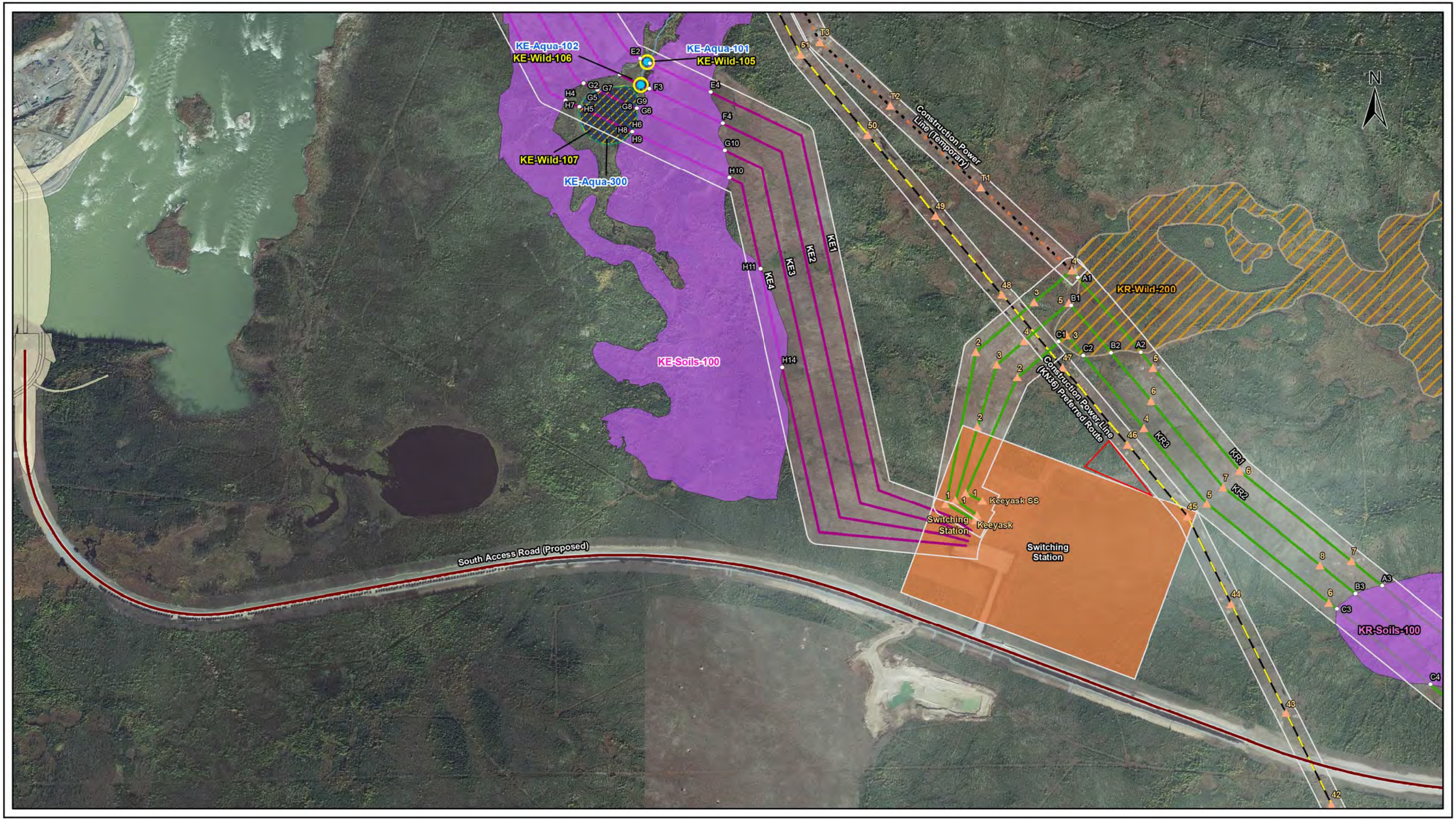
Sec-ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
KR1	KR-Soils-100	Permafrost-Extensive Discontinuous	Site: A3 to A4	E-366994 N-6244471	E-367353 N-6244180	15N	461 m
KR3	KR-Soils-100	Permafrost-Extensive Discontinuous	Site: B3 to B4	E-366919 N-6244448	E-367256 N-6244175	15N	433 m
KR2	KR-Soils-101	Permafrost-Extensive Discontinuous	Site: C5 to C6	E-368536 N-6243952	E-368704 N-6243976	15N	169 m
KR1	KR-Soils-102	Permafrost-Extensive Discontinuous	Site: A9 to A10	E-369858 N-6244381	E-370091 N-6244414	15N	235 m
KR3	KR-Soils-102	Permafrost-Extensive Discontinuous	Site: B5 to B6	E-369908 N-6244323	E-370240 N-6244370	15N	335 m
KR2	KR-Soils-103	Permafrost-Extensive Discontinuous	Site: C7 to C8	E-369836 N-6244138	E-370481 N-6244230	15N	651 m
IN ROW	KR-Soils-104	Permafrost-Extensive Discontinuous	Site: B6A to B6B	E-370431 N-6244362	E-370489 N-6244371	15N	60 m
KR2	KR-Soils-105	Permafrost-Extensive Discontinuous	Site: C11 to C12	E-370642 N-6244253	E-371031 N-6244308	15N	393 m

Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting
- Use existing trails, roads or cut lines whenever possible as access routes
- Avoid organic soils containing permafrost to the extent possible
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan



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- Transmission Line
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- Active Railway
- Abandoned Railway

Project Infrastructure
- Towers (Preliminary)*
- Generation Outlet Transmission Line
- Construction Power Line (Kn36)
- Construction Power Line (Temporary)
- Project Footprint (ROW)
- Unit Lines
- Access Route
- Switching Station Site

*Towers are subject to change, and are only use as a rough guide

ESS Features
- Archaeological Site
- Historical
- Water Crossing
- Birds and Habitat
- Mammals and Habitat
- Marsh Habitat
- Water and Wetland Habitat
- Permafrost

Keeyask Transmission Project
Construction Environmental Protection Plan

Environmentally Sensitive Site Locations

Unit (KR) Lines

Map 10

ESS Group: Permafrost

Sec-ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
KR1	KR-Soils-100	Permafrost-Extensive Discontinuous	Site: A3 to A4	E-366994 N-6244471	E-367353 N-6244180	15N	461m
KR3	KR-Soils-100	Permafrost-Extensive Discontinuous	Site: B3 to B4	E-366919 N-6244448	E-367256 N-6244175	15N	433m
KR2	KR-Soils-100	Permafrost-Extensive Discontinuous	Site: C3 to C4	E-366868 N-6244406	E-367129 N-6244194	15N	336m

Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting
- Use existing trails, roads or cut lines whenever possible as access routes
- Avoid organic soils containing permafrost to the extent possible
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

ESS Group: Mammals and Habitat

Sec-ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
KR1	KR-Wild-200	Caribou calving habitat	Site: A1 to A2	E-366140 N-6245336	E-366315 N-6245127	15N	273 m
KR3	KR-Wild-200	Caribou calving habitat	Site: B1 to B2	E-366121 N-6245258	E-366233 N-6245124	15N	173 m
KR2	KR-Wild-200	Caribou calving habitat	Site: C1 to C2	E- 366086 N- 6245156	E-366154 N-6245117	15N	102 m

Potential Effects:

Potential for sensory disturbance resulting the temporary abandonment of the calving area

Specific Mitigation:

- No shear blading to clear right of way (ROW). Only use selective cutting methods to remove danger trees, vegetation within tower footprint, access route, and helicopter access points, to maintain low tree, shrub and herb plant communities on the ROW
- Maintenance trails to be maintained to reduce line of sight for hunters and predators
- Annual ground inspection of towers to occur late in winter season to avoid creating packed snow trails that facilitate predator use of the ROW
- Any Manitoba Hydro constructed or improved access routes used to access the ROW for construction that will not be needed for future maintenance will be decommissioned on completion of construction