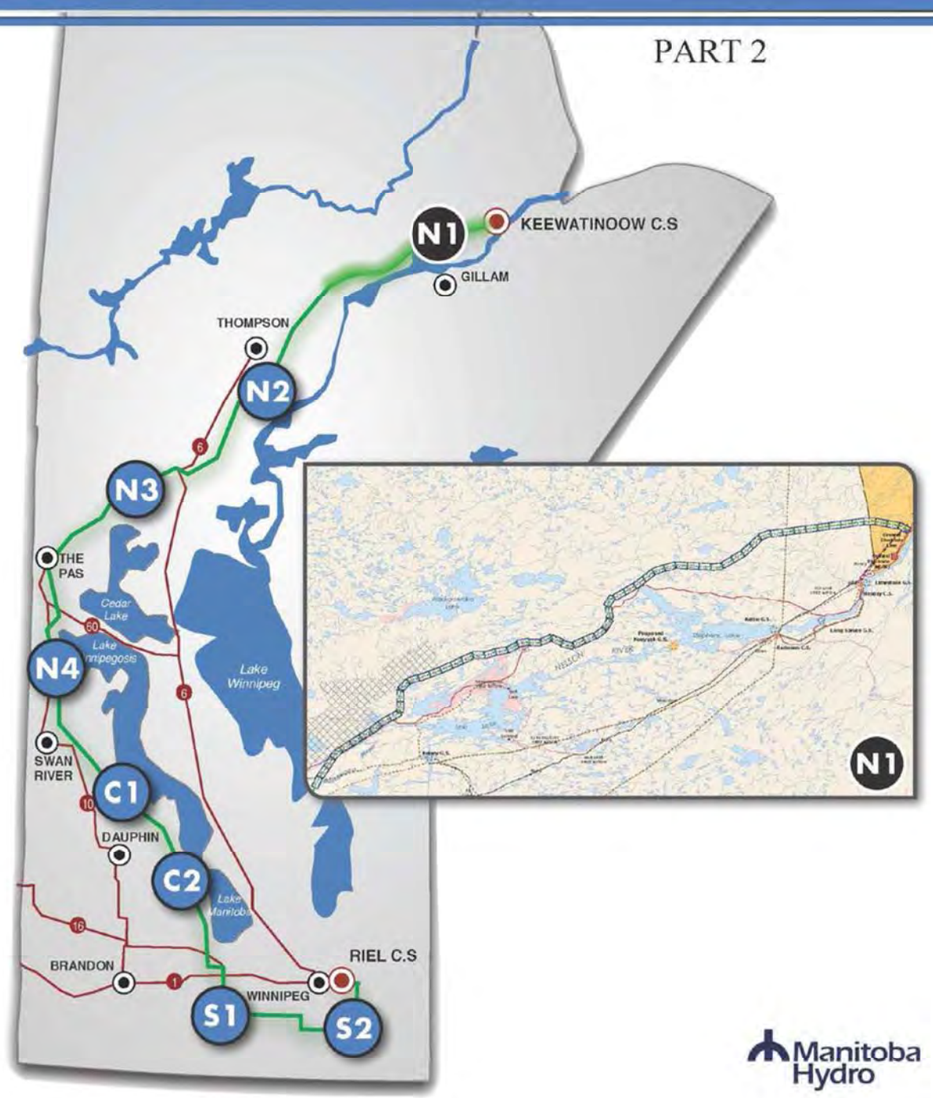
BIPOLE III TRANSMISSION PROJECT
CONSTRUCTION ENVIRONMENTAL PROTECTION PLAN
- SECTION N1

PART 2



Manitoba Hydro

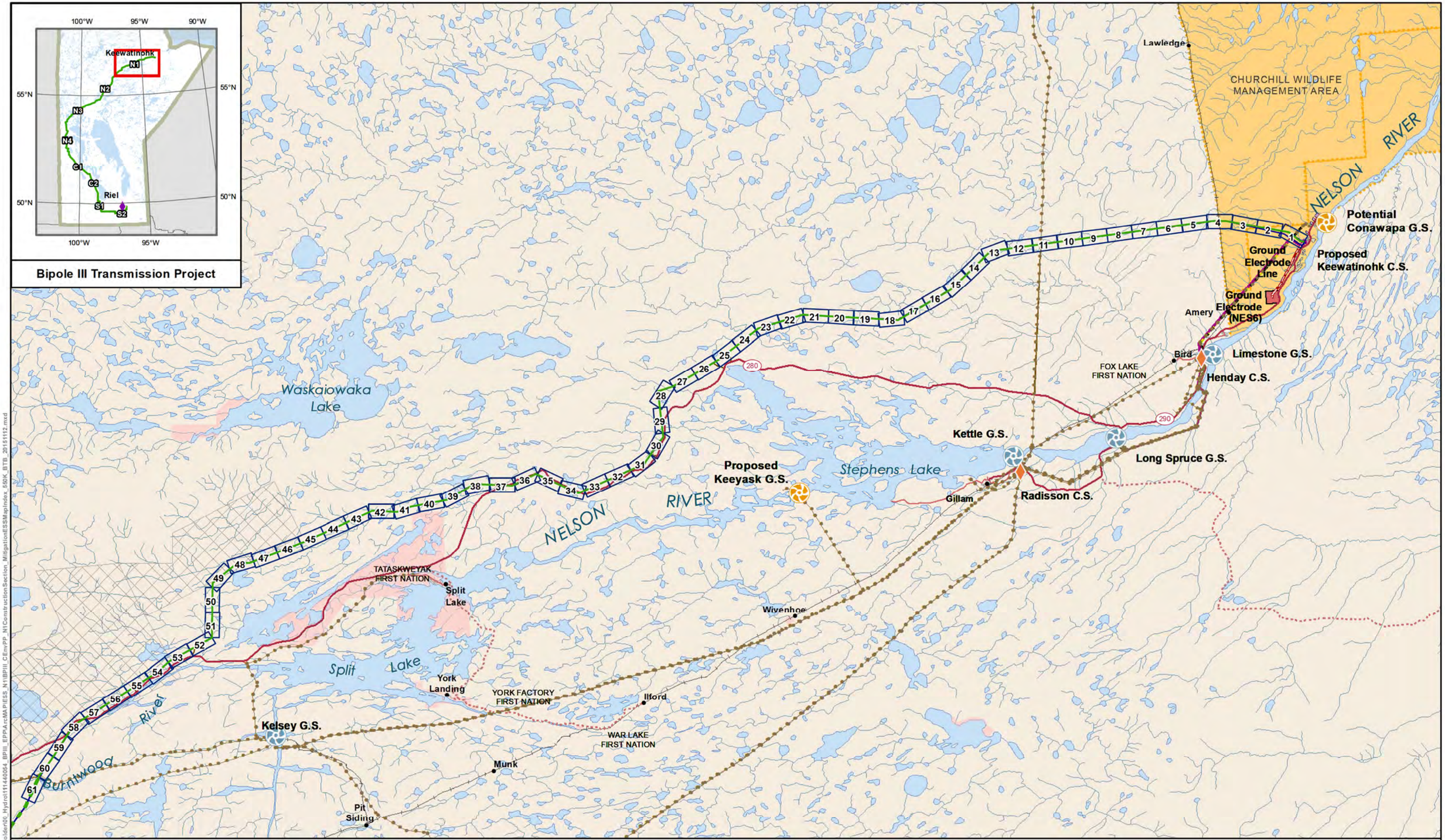
Document Owner:
Licensing and Environmental Assessment Department
Transmission Planning and Design Division
Transmission Business Unit
Manitoba Hydro

Final 4.0

List of Revisions- BPIII Environmental Protection Plan N1 Section

Number	Nature of Revision	Page/Map #	Revised By	Date
2.01	Removed N1-Aqua-157 based on ground truthing by Environmental Inspector who found no evidence of a stream crossing	Map #50	Kris Watts	2015-03-05
2.02	Stream Crossing Habitat Classification information missing in previous version due to computer scripting error are now populated in this update	Any page that has a stream crossing and that info was available	Kris Watts	2015-03-05
2.03	Snow Mobile Trail identified by Environmental Inspector added "N1-Acss-104A"	Map #40	Stantec	2015-03-05
2.04	Removed N1-Aqua-126, N1-Aqua-152 and N1-Aqua-164, N1-Aqua-112 and N1-Aqua-147 based on ground truthing by Environmental Inspector who found no evidence of a stream crossing	Maps #22, #48 and #56	Kris Watts	2015-03-05
3.00	Sensitive sites will now be symbolized in grey with white Halos for better visibility	All maps with SS	Stantec	2015-10-30
3.01	Removed Mitigation measure that referred to DFO operational statement as Fisheries and Oceans Canada no longer uses operational statements but rather "Measures to Avoid Causing Harm to Fish and Fish Habitat" These measures are reflected in the text of the CEnvPP	Any mitigation text for stream crossings or water bodies	Kris Watts	2015-03-27
3.02	To help prevent confusion with access trails, recreational trails will be renamed, for example ALL Accss features will now be called RecUse eg "N4-Accss-100" will now be "N4-RecUse-100" sion	Maps 17,22,24,26,34,40,41, 45,55,56,58,59	Stantec	2015-10-30
3.03	Removed the Bird Sensitive timing window mitigation measure statement that indicates a timing window as this is observed throughout the project not just at that specific ESS and indicated in the appendix of the text CEnvPP document	Any map with ESS Group: Birds and Habitat on it	Manitoba Hydro	Oct 6 2015
3.04	The addition of lines representing Bypass trails needed during construction (Please find a good color for these, try and find something distinct)	Any associated map	Stantec	2015-10-30

3.05	The addition of Species of Concern Identified by field activities N1-Eco-300, N1-Eco-301, N1-Eco-302	Maps 11, 24 and 34	Manitoba Hydro	20151102
3.06	Removed Bird Sensitivity Area Line features that were used to indicate locations of intended bird diverter installations. This will be indicated to the contractor through engineer drawings	Removed from any associated map	Manitoba Hydro	20151102
3.07	Removed labels from major stream crossings, rail crossing and transmission line crossings, and access route points. Labels for access routes remain.	Any associated Map	Manitoba Hydro	20151103
3.08	Incorporation of additional access routes from the 2014 construction season	Any associated Map	Stantec	20151112
3.09	Field investigation provided for more accurate coordinates for N1-Hert-110 the point was moved 294 meters along the ROW	Map 53	Manitoba Hydro	20160112
3.10	Mitigation measures for Aqua points have included a timing window statement that considered fall spawning fish "No instream works or fording from September to…" These fish are unlikely to occur in streams and therefore aren't a concern in stream crossings. This statement will be updated in subsequent versions to read "No instream works or fording from April 1 - July 15"	Map/Page 1-2,5,8,10-12,17,19,21-24,28-30,32,37-40,42-43,45-47,49-52,54-56,58-61	Manitoba Hydro	20160121
4.0	Addition of Permafrost Monitoring Sites N1-Eco-200 and N1-Eco-201	Map 35 and 58	Manitoba Hydro	20161101



Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, Stantec, ProvMB, NRCAN
Date Created: November 12, 2015
Version: Final 4.0

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0 5 10 Miles

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Legend

- Final Preferred Route
- Section N1
- Converter Station
- Map Index Grid (1:10,000)
- Existing G.S.
- Proposed G.S.
- Transmission Line
- Ground Electrode
- Mineral Rights
- First Nation
- Wildlife Management Area

Bipole III Transmission Line Project
Construction Environmental Protection Plan

N1 Construction Section
Key Map Index

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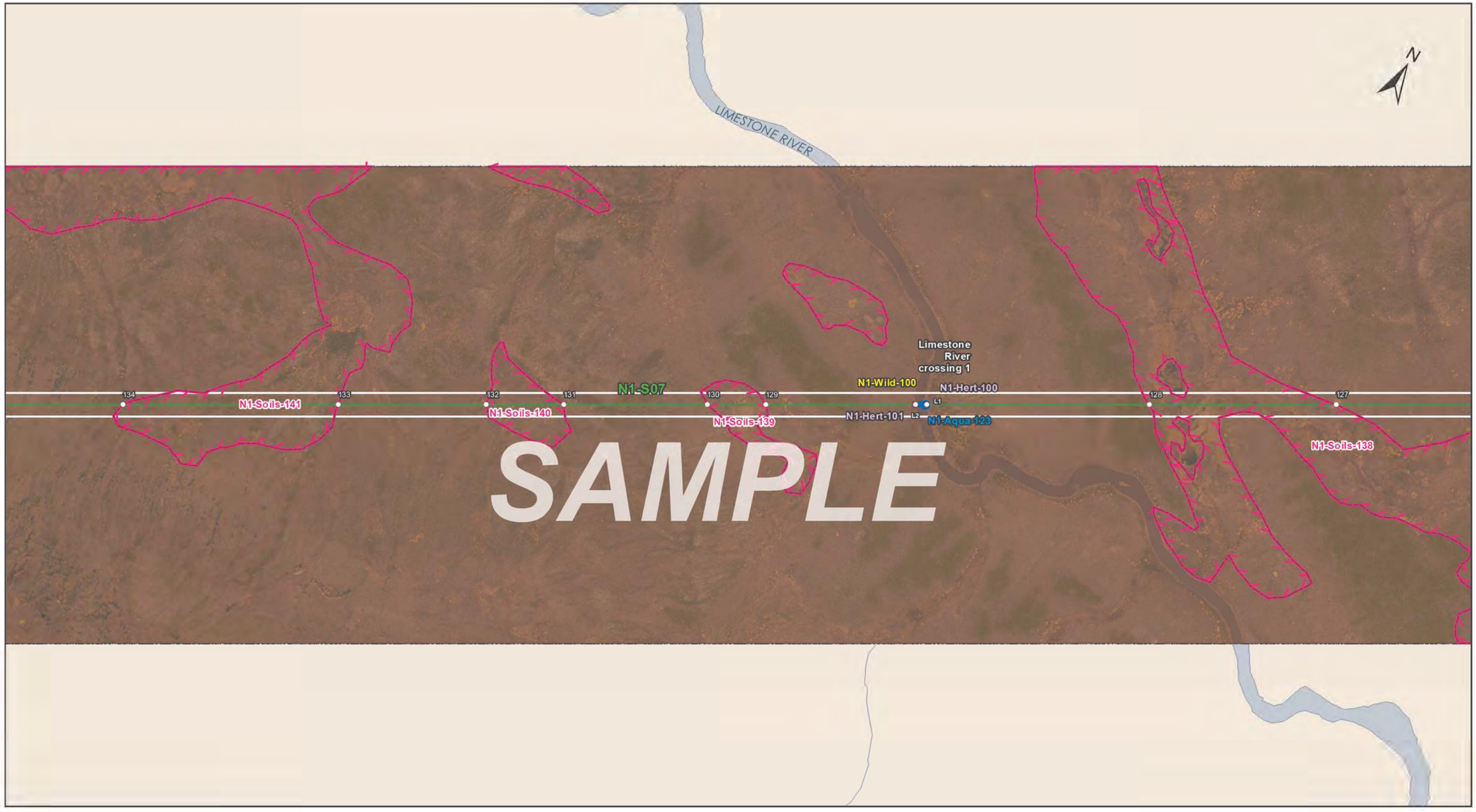

Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: December 09, 2013

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Metres

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Land Base
- Transmission Line
- Highway
- Major Road
- Local Road
- Winter Road
- Railway (Operational)
- Railway (Discontinued)
- Mining

Project Infrastructure
- Angle Tower Locations
- BPIII Final Preferred Route
- 66 m Right of Way

Points of Access*
- Proposed Access Point
- Major Stream Crossing
- Abandoned Rail Crossing
- Rail Crossing
- Transmission Line Crossing
- Proposed Access Route

*Labels correspond to BPIII Access Management Database

ESS Features
Heritage
- Archaeological

Water
- Water Crossing

Wildlife
- Birds and Habitat

Soils and Terrain
- Permafrost

Bipole III Transmission Project
Construction Environmental Protection Plan
Construction Section N2 1
Environmentally Sensitive Site Locations

Map 17

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SAMPLE MITIGATION TABLE (see adjacent KEY for additional information)

MAP NUMBER : 17 [1]

ESS Group : Water Crossing [2]

Sec-Seg ID	ESS ID	ESS Name	Easting	Northing	UTM Zone	Channel Width	Wet Width	Fish Habitat Class	Habitat Sensitivity
N1-S07	N1-Aqua-123	Limestone River	754280	6280471	14N	12m	12m	Low	Important

3

Potential Effects: [4]

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

Specific Mitigation: [5]

- 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

ESS Group : Birds and Habitat

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S07	N1-Wild-100	Limestone River crossing; movement route for raptors and waterfowl	Site: L1 to L2	E- 754292 N- 6280478	E- 754267 N- 6280463	14N	29 m

3

Potential Effects: [4]

Higher risk of wire collision, risk of wire collision is localized to the right-of-way

Specific Mitigation: [5]

- Adhere to reduced risk timing windows for protection of birds (August 1- April 30)
- Maintain setback during timing window

ESS Group : Permafrost

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S07	N1-Soils-138	Permafrost	Site: 127 to 128	E-755259 N-6281038	E-754819 N-6280783	14N	509 m

3

Potential Effects: [4]

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

Specific Mitigation: [5]

- 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
- Remove trees by low-disturbance methods

ESS and mitigation shown includes only a sample of actual mitigation for the ESS features listed; refer to the Construction Environmental Protection plan for all specific mitigation measures recommended

KEY to SAMPLE MITIGATION TABLE

1 Map on which ESS listed in the ESS Location Summary tables are illustrated

2 ESS Group classification of ESS shown on the map

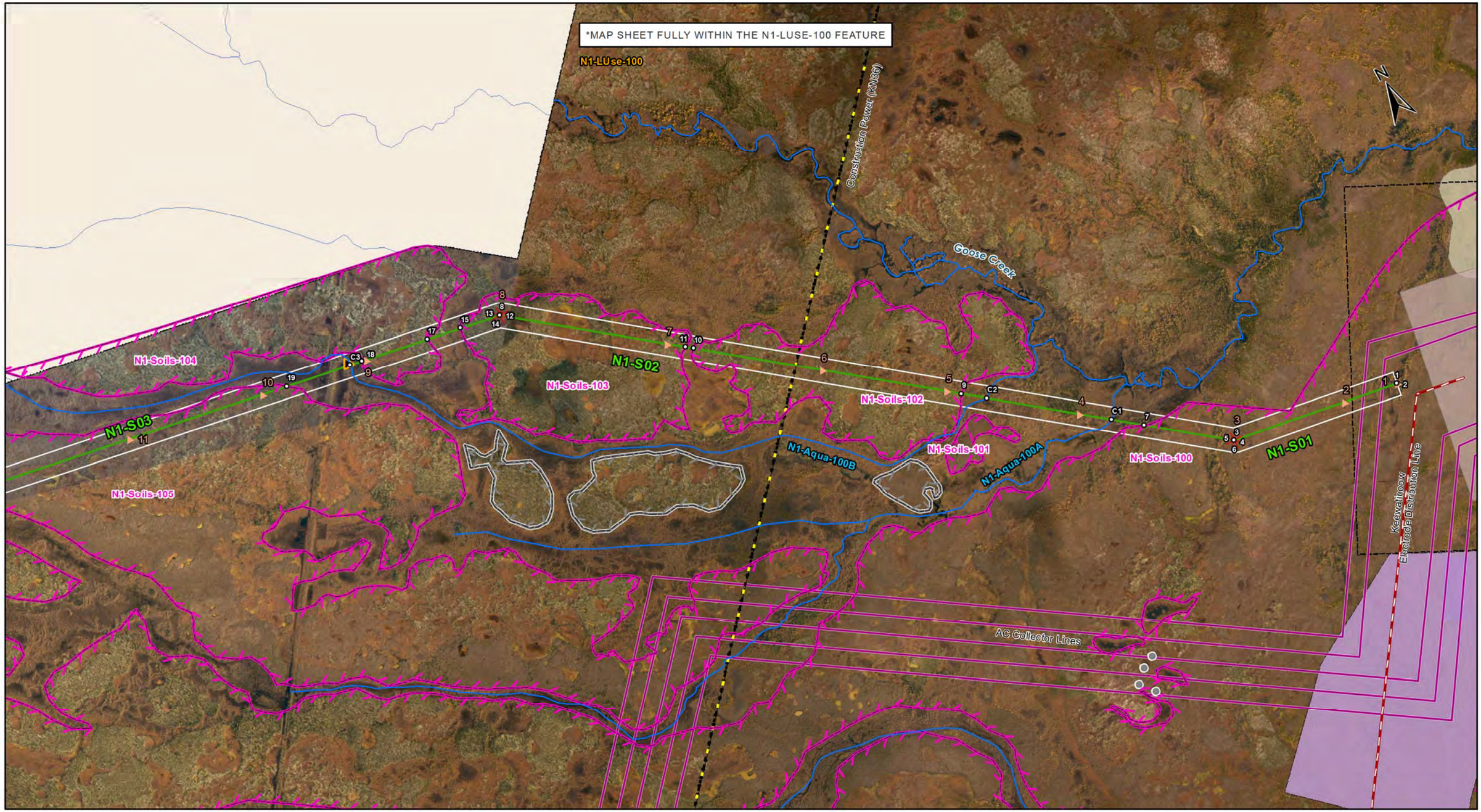
3 ESS location summary; includes the following fields:
- Sec-Seg - ID of the construction section (i.e. N1) and segment (i.e. S03) for ESS location
- ESS ID - Site specific ID assigned to each ESS according to **naming convention** listed below
- ESS Name - Brief name/description of ESS
- Easting/Northing - UTM coordinates of ESS location (for points only)
- Location - site identification numbers for the start and stop site points of ESS intersection with the ROW (lines and polygons only)
- Start/Stop - UTM coordinates of the start/stop identification numbers listed in the "Location" field (lines and polygons only)
- Characteristics of stream crossings identified in the ESS Location Summary tables (where applicable and as information is available)

4 Potential effects identified for ESS listed in the ESS Location Summary table

5 Mitigation measures identified for ESS listed in the ESS Location Summary table

ESS NAMING CONVENTION

CATEGORY	GROUP (Number Series Representing Group)	ESS ID (Section ID-Category-Group Number)
Access	Intersection (100)	N1-Acss-100
Ecosystem	Habitat (100)	N1-Eco-100
	Research (200)	N1-Eco-200
	Species of Concern (300)	N1-Eco-300
Heritage	Archaeological (100)	N1-Hert-100
	Cultural (200)	N1-Hert-200
	Historic (300)	N1-Hert-300
Land Use	Conservation (100)	N1-LUse-100
	Crown Land Encumbrance (200)	N1-LUse-200
	Recreation (300)	N1-LUse-300
	Residential (400)	N1-LUse-400
Resource Use	Agriculture (100)	N1-RUse-100
	Food/Medicinal (200)	N1-RUse-200
	Forestry (300)	N1-RUse-300
	Hunting/Fishing (400)	N1-RUse-400
	Trapping (500)	N1-RUse-500
Soils and Terrain	Permafrost (100-200)	N1-Soils-100
	Erosion (300)	N1-Soils-300
	Terrain (400)	N1-Soils-400
Water	Water Crossing (100)	N1-Aqua-100
	Groundwater (200)	N1-Aqua-200
	Wetlands (300)	N1-Aqua-300
Wildlife	Birds and Habitat (100)	N1-Wild-100
	Mammal and Habitat (200)	N1-Wild-200
	Reptiles/Amphibians and Habitat (300)	N1-Wild-300



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Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: November 12, 2015
Version: Final 4.0

0 125 250 500
Metres

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Land Base
- Transmission Line
- Highway
- Major Road
- Local Road
- Winter Road
- Railway (Operational)
- Railway (Discontinued)
- Mining

Project Infrastructure
- Angle Tower Locations*
- Towers (Preliminary)*
- BPIII Final Preferred Route
- 66 m Right of Way

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

Sensitive Sites*
- Point Features
- Linear Features
- Area Features

*Currently outside the Project footprint

Points of Access
- Proposed Access Point
- Major Stream Crossing
- Abandoned Rail Crossing
- Rail Crossing
- Transmission Line Crossing
- Bypass Trails
- Approved Access Route

ESS Features
Water
- Water Crossing

Land Use
- Conservation

Soils and Terrain
- Permafrost

Bipole III Transmission Project
Construction Environmental Protection Plan
Construction Section N1
Environmentally Sensitive Site Locations

Map 1

ESS Group: Water Crossing

Sec-Seg ID	ESS ID	Location	ESS Name	Crossing Coordinates	UTM Zone
N1-S02	N1-Aqua-100A	C1	Unnamed Tributary of Goose Creek	E-814224 N-6291425	14N
N1-S02	N1-Aqua-100B	C2	Unnamed Tributary of Goose Creek	E-813954 N-6291637	14N
N1-S03	N1-Aqua-100B	C3	Unnamed Tributary of Goose Creek	E-812478 N-6292544	14N

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
- No instream works or fording from April 1 - July 15

ESS Group: Conservation

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S01	N1-LUse-100	Churchill Wildlife Management Area	Site: 1 to 4	E-814952 N-6291139	E-814490 N-6291215	14N	467 m
N1-S02	N1-LUse-100	Churchill Wildlife Management Area	Site: 6 to 8	E-814490 N-6291215	E-812899 N-6292469	14N	2026 m
N1-S03	N1-LUse-100	Churchill Wildlife Management Area	Site: 13 to 16	E-812899 N-6292469	E-802831 N-6294268	14N	10227 m

Potential Effects:

Intersects Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group: Permafrost

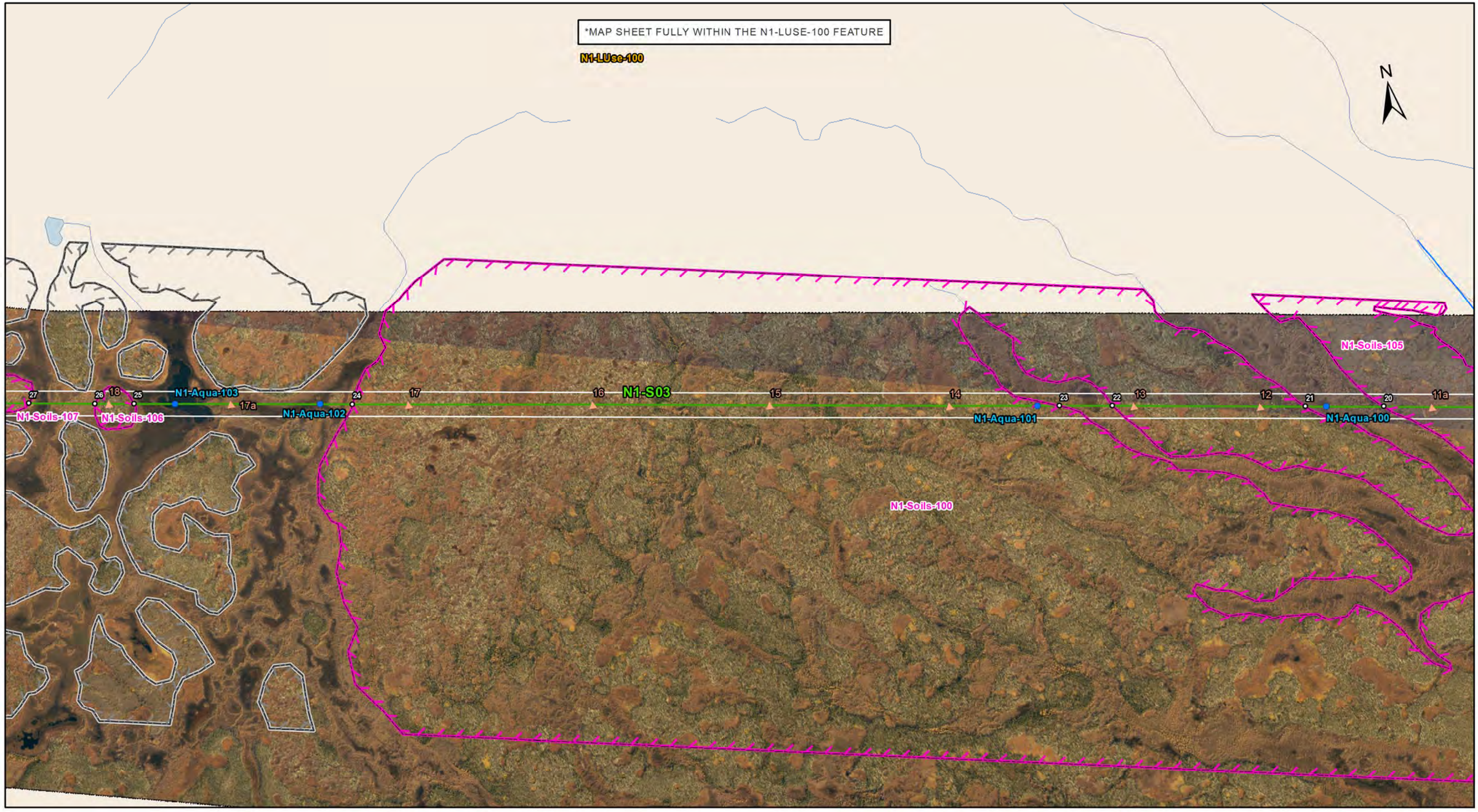
Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S01	N1-Soils-100	Permafrost	Site: 2 to 3	E-814952 N-6291139	E-814490 N-6291215	14N	467 m
N1-S02	N1-Soils-100	Permafrost	Site: 5 to 7	E-814490 N-6291215	E-814296 N-6291368	14N	247 m
N1-S02	N1-Soils-102	Permafrost	Site: 9 to 10	E-813899 N-6291680	E-813318 N-6292138	14N	739 m
N1-S02	N1-Soils-103	Permafrost	Site: 11 to 12	E-813301 N-6292151	E-812899 N-6292469	14N	512 m
N1-S03	N1-Soils-103	Permafrost	Site: 14 to 15	E-812899 N-6292469	E-812788 N-6292488	14N	112 m
N1-S03	N1-Soils-104	Permafrost	Site: 17 to 18	E-812695 N-6292505	E-812511 N-6292538	14N	187 m
N1-S03	N1-Soils-105	Permafrost	Site: 19 to 20	E-812298 N-6292576	E-811331 N-6292749	14N	982 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
- 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



Manitoba Hydro

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Metres

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Land Base
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ESS Features

Water
- Water Crossing

Water
- Water Crossing

Land Use
- Conservation

Soils and Terrain
- Permafrost

Bipole III Transmission Project
Construction Environmental Protection Plan
Construction Section N1
Environmentally Sensitive Site Locations

Map 2

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ESS Group: Water Crossing

Sec-Seg ID	ESS ID	ESS Name	Easting	Northing	UTM Zone	Channel Width	Wet Width	Fish Habitat Class	Habitat Sensitivity
N1-S03	N1-Aqua-100	Unnamed Tributary of Goose Creek	811177	6292777	14N	N/A	N/A	Moderate	Marginal
N1-S03	N1-Aqua-101	Unnamed Tributary of Goose Creek	810401	6292915	14N	N/A	N/A	Moderate	Marginal
N1-S03	N1-Aqua-102	Unnamed Tributary of Tiny Creek	808477	6293259	14N	N/A	N/A	Moderate	Marginal
N1-S03	N1-Aqua-103	Unnamed wetland	808089	6293329	14N	N/A	N/A	Low	No Fish Habitat

Potential Effects:

Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; Damage to stream banks; Loss of riparian vegetation; Fish habitat disturbances and 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
- No instream works or fording from April 1 - July 15

ESS Group: Conservation

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S03	N1-LUse-100	Churchill Wildlife Management Area	Site: 13 to 16	E-812899 N-6292469	E-802831 N-6294268	14N	10227 m

Potential Effects:

Intersects Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector.
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group: Permafrost

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S03	N1-Soils-100	Permafrost	Site: 21 to 22	E-811121 N-6292786	E-810603 N-6292879	14N	526 m
N1-S03	N1-Soils-100	Permafrost	Site: 23 to 24	E-810461 N-6292904	E-808566 N-6293243	14N	1925 m
N1-S03	N1-Soils-105	Permafrost	Site: 19 to 20	E-812298 N-6292576	E-811331 N-6292749	14N	982 m
N1-S03	N1-Soils-106	Permafrost	Site: 25 to 26	E-807979 N-6293348	E-807875 N-6293366	14N	105 m
N1-S03	N1-Soils-107	Permafrost	Site: 27 to 28	E-807698 N-6293398	E-807340 N-6293462	14N	363 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
- Maintain shrub and herbaceous vegetation to the extent possible
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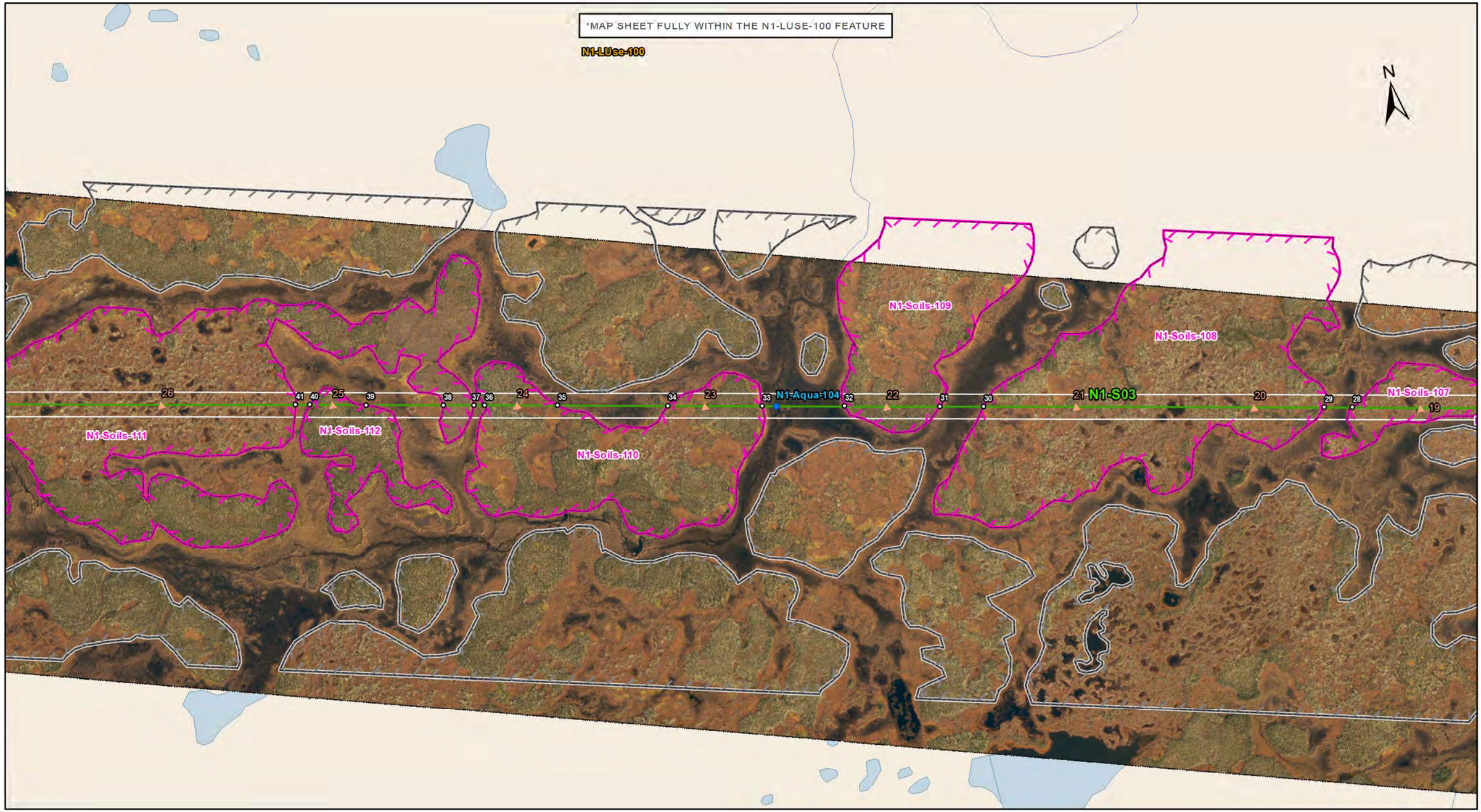

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Manitoba Hydro

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Metres

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- Water Crossing

Land Use
- Conservation

Soils and Terrain
- Permafrost

Bipole III Transmission Project
Construction Environmental Protection Plan
Construction Section N1
Environmentally Sensitive Site Locations

Map 3

ESS Group: Water Crossing

Sec-Seg ID	ESS ID	ESS Name	Easting	Northing	UTM Zone	Channel Width	Wet Width	Fish Habitat Class	Habitat Sensitivity
N1-S03	N1-Aqua-104	Unnamed Tributary of Goose Creek	805799	6293738	14N	N/A	5m	Moderate	Marginal

Potential Effects:

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

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
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- 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.
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ESS Group: Conservation

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
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Potential Effects:

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- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group: Permafrost

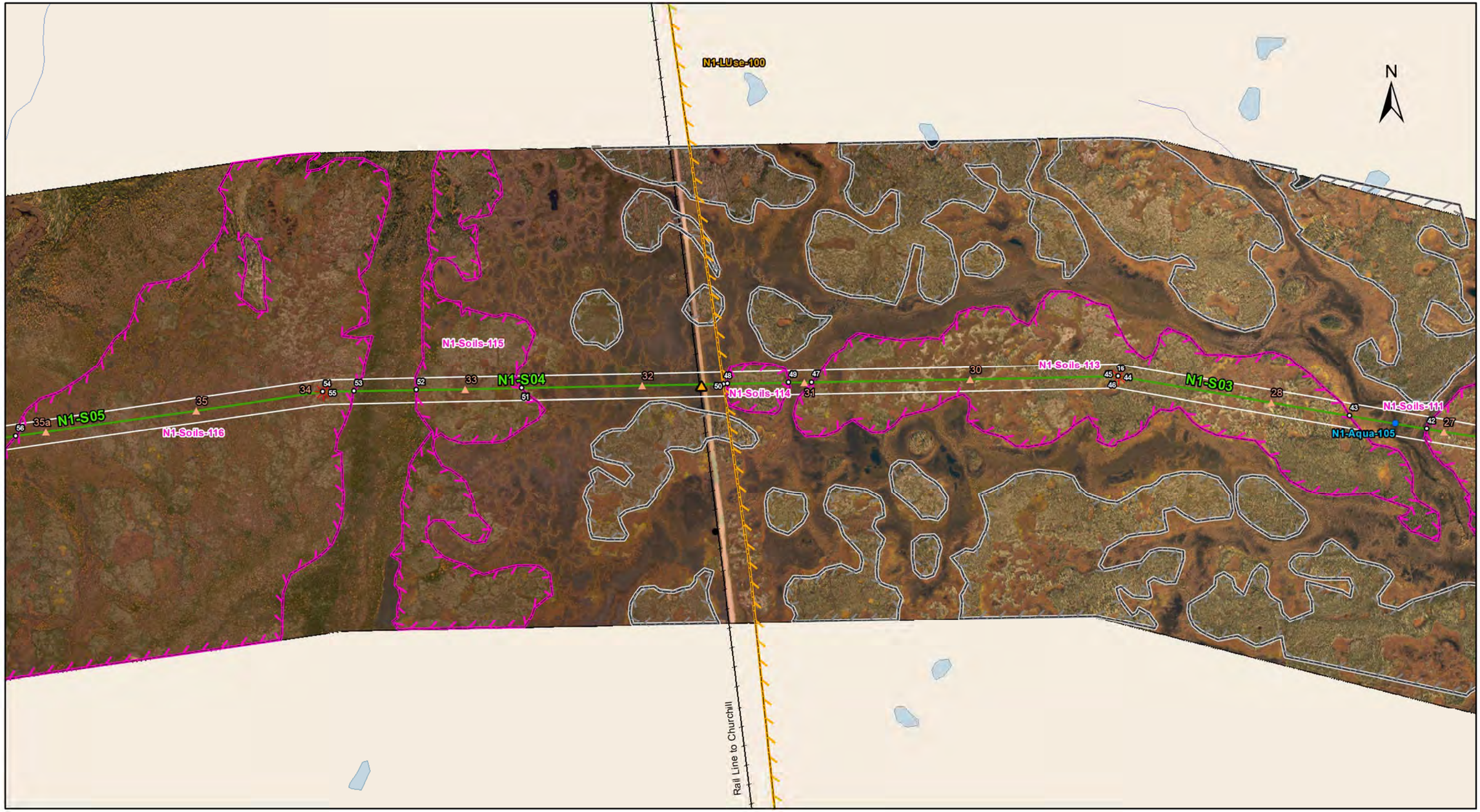
Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S03	N1-Soils-107	Permafrost	Site: 27 to 28	E-807698 N-6293398	E-807340 N-6293462	14N	363 m
N1-S03	N1-Soils-108	Permafrost	Site: 29 to 30	E-807266 N-6293475	E-806353 N-6293638	14N	926 m
N1-S03	N1-Soils-109	Permafrost	Site: 31 to 32	E-806237 N-6293659	E-805982 N-6293705	14N	259 m
N1-S03	N1-Soils-110	Permafrost	Site: 33 to 34	E-805762 N-6293744	E-805508 N-6293789	14N	257 m
N1-S03	N1-Soils-110	Permafrost	Site: 35 to 36	E-805213 N-6293842	E-805019 N-6293877	14N	197 m
N1-S03	N1-Soils-111	Permafrost	Site: 37 to 38	E-804990 N-6293882	E-804908 N-6293897	14N	83 m
N1-S03	N1-Soils-111	Permafrost	Site: 41 to 42	E-804512 N-6293968	E-803669 N-6294118	14N	856 m
N1-S03	N1-Soils-112	Permafrost	Site: 39 to 40	E-804702 N-6293934	E-804551 N-6293960	14N	152 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
- 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



Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: November 12, 2015
Version: Final 4.0

0 125 250 500
Metres

1:10,000

Land Base
- Transmission Line
- Highway
- Major Road
- Local Road
- Winter Road
- Railway (Operational)
- Railway (Discontinued)
- Mining

Project Infrastructure
- Angle Tower Locations*
- Towers (Preliminary)*
- BPIII Final Preferred Route
- 66 m Right of Way

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

Sensitive Sites*
- Point Features
- Linear Features
- Area Features

*Currently outside the Project footprint

Points of Access
- Proposed Access Point
- Major Stream Crossing
- Abandoned Rail Crossing
- Rail Crossing
- Transmission Line Crossing
- Bypass Trails
- Approved Access Route

ESS Features
Water
- Water Crossing

Land Use
- Conservation

Soils and Terrain
- Permafrost

Bipole III Transmission Project
Construction Environmental Protection Plan
Construction Section N1
Environmentally Sensitive Site Locations

Map 4

DOCUMENT PATH: G:_GIS_PROJECT_FOLDER\00_HYDRO\111440054_BPIII_EPP\ARCMAP\ESS_N1\BPIII_CENVPP_N1SECTION_MAPBOOK_FORHYDRO_20151112.MXD

ESS Group: Water Crossing

Sec-Seg ID	ESS ID	ESS Name	Easting	Northing	UTM Zone	Channel Width	Wet Width	Fish Habitat Class	Habitat Sensitivity
N1-S03	N1-Aqua-105	Unnamed Tributary of Goose Creek	803583	6294134	14N	N/A	5m	Moderate	Marginal

Potential Effects:

Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; Damage to stream banks; Loss of riparian vegetation; Fish habitat disturbances and 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: Conservation

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S03	N1-LUse-100	Churchill Wildlife Management Area	Site: 13 to 16	E-812899 N-6292469	E-802831 N-6294268	14N	10227 m
N1-S04	N1-LUse-100	Churchill Wildlife Management Area	Site: 45 to 48	E-802831 N-6294268	E-801756 N-6294256	14N	1074 m

Potential Effects:

Intersects Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector.
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group: Permafrost

Sec-Seg ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
N1-S03	N1-Soils-111	Permafrost	Site: 41 to 42	E-804512 N-6293968	E-803669 N-6294118	14N	856 m
N1-S03	N1-Soils-113	Permafrost	Site: 43 to 44	E-803459 N-6294156	E-802831 N-6294268	14N	638 m
N1-S04	N1-Soils-113	Permafrost	Site: 46 to 47	E-802831 N-6294268	E-801997 N-6294259	14N	833 m
N1-S04	N1-Soils-114	Permafrost	Site: 49 to 50	E-801935 N-6294258	E-801768 N-6294256	14N	166 m
N1-S04	N1-Soils-115	Permafrost	Site: 51 to 52	E-801207 N-6294250	E-800921 N-6294247	14N	286 m
N1-S04	N1-Soils-116	Permafrost	Site: 53 to 54	E-800753 N-6294245	E-800666 N-6294244	14N	86 m
N1-S05	N1-Soils-116	Permafrost	Site: 55 to 56	E-800666 N-6294244	E-799832 N-6294132	14N	841 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
- 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