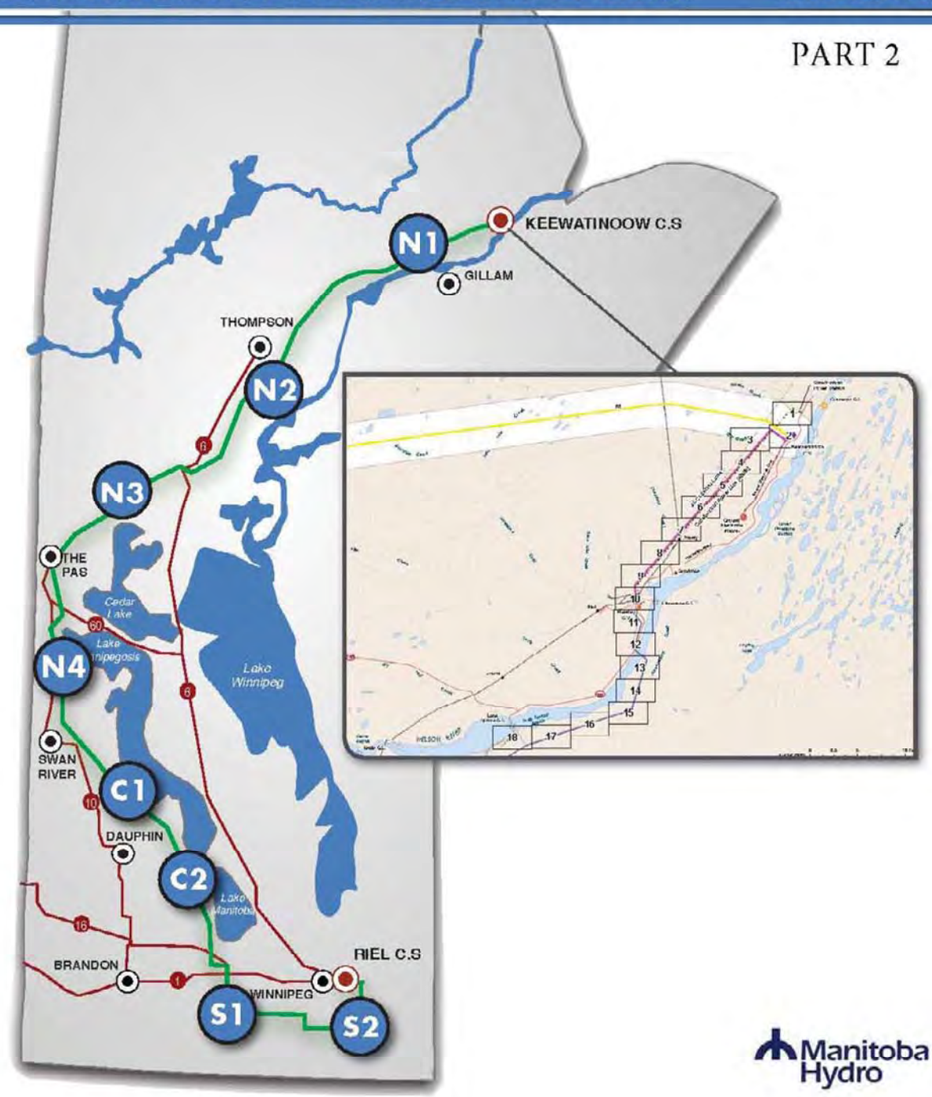
BIPOLE III TRANSMISSION PROJECT
CONSTRUCTION ENVIRONMENTAL PROTECTION PLAN
- AC COLLECTOR LINES,
CONSTRUCTION POWER LINE AND STATION MAPBOOK

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 AC Collector Lines, construction power line and Station

Number	Nature of Revision	Page/Map #	Revised By	Date
3.00	Added Species of Concern from vegetation survey results: CP-Eco-302-308 and KW-Eco-317b	Map 2,3,9	Manitoba Hydro	2016-01-08
3.01	Addition of Preliminary Tower Locations for AC Collectors	All	Manitoba Hydro	2016-01-08
3.02	Updates to Construction KN36 line route into construction power station	Map 1	Manitoba Hydro	2016-01-08
3.03	Updates to mitigation wording that facilitate construction under non-frozen ground conditions in select tower locations of low risk permafrost for a select period of time	Maps 8,9 and 12	Manitoba Hydro	2016-08-05
4.00	CP-Aqua-101 was updated, as it was indicating an incorrect location	Map 2	Manitoba Hydro	2016-11-14
	Permafrost monitoring sites were added CP-Eco-200 and CL-Eco-200	Maps 7 and 10	Manitoba Hydro	2016-11-15

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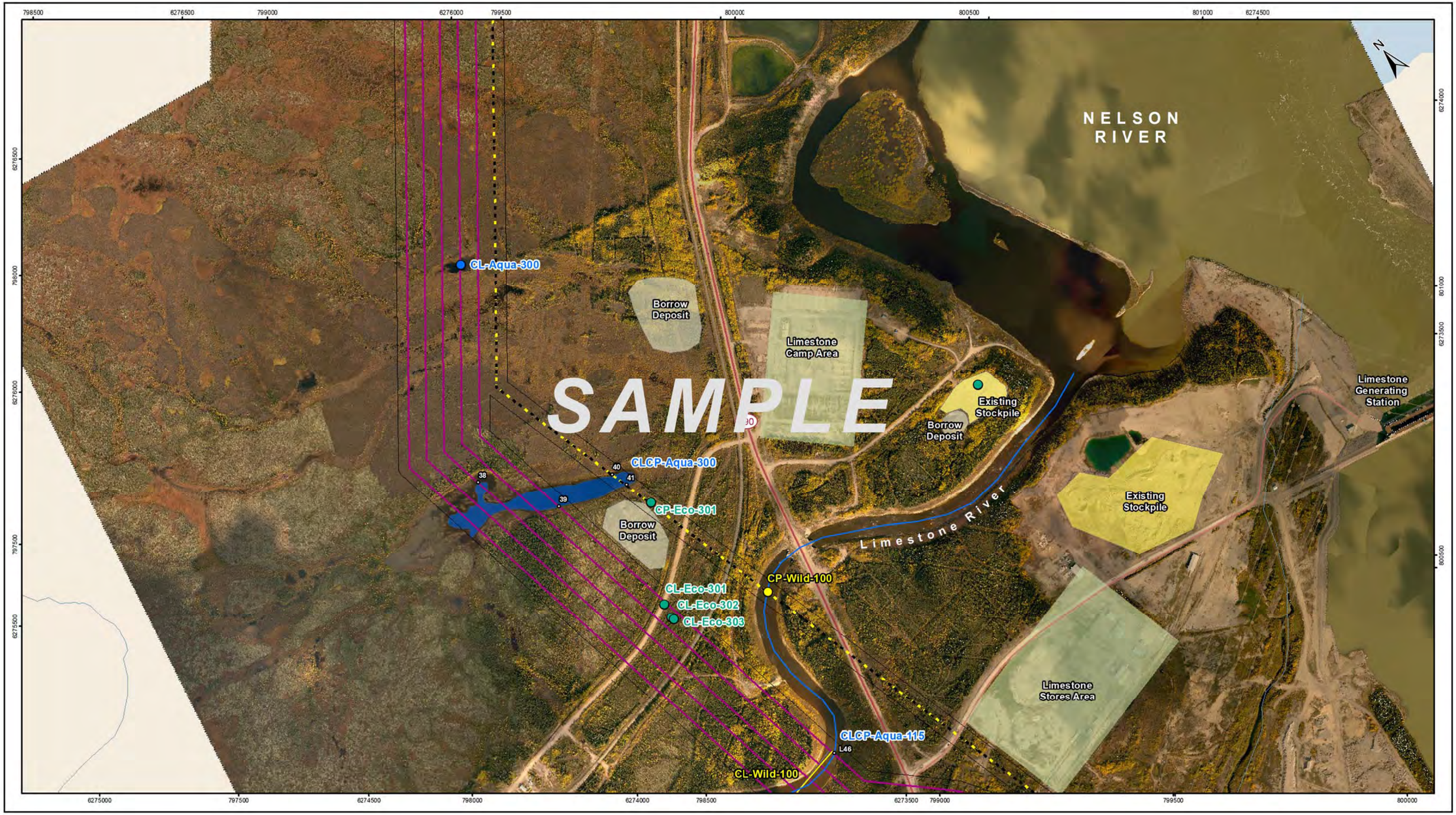

Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: October 24, 2013

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Metres
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Land Base
- Provincial Highways
- Provincial Roads
- Watercourse
- Waterbodies

Project Infrastructure
- BPIII Final Preferred Route
- AC Collector Lines
- Construction Power Line
- Keewatinoow Converter Station
- Keewatinow Work Area Zone
- Manitoba Hydro & Contractor Work Area
- Borrow Deposits
- Excavated Material Placement Area
- Existing Stockpiles

ESS Legend

Ecosystem
- Species of Concern

Wildlife
- Birds and Habitat

Water
- Water Crossing

Water
- Water Crossing

Wildlife
- Birds and Habitat

Water
- Water Crossing

Bipole III Transmission Project
Construction Environmental Protection Plan
AC Collector, Construction Power Lines and Construction Power Site Environmentally Sensitive Site Locations

Map 8

SAMPLE MITIGATION TABLE (see adjacent KEY for additional information)

MAP NUMBER : 8 [1]

ESS Group: Species of Concern [2]

Sec ID	ESS ID	ESS Name	Easting	Northing
CP	CP-Eco-301	Species of Concern (plant)	798921	6274596
CL	CL-Eco-301	Species of Concern (plant)	798761	6274354

3

Potential Effects: [4]

CP-Eco-301, CL-Eco-301, CL-Eco-302, CL-Eco-303: *Potential loss of plants of conservation concern from clearing, construction, maintenance and decommissioning activities.*

Specific Mitigation: [5] *

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion

ESS Group : Water Crossing[2]

Sec ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone	Distance
CL	CLCP-Aqua-300	Unnamed Wetland	Site: 38 to 39	E-798591 N-6274961	E-798718 N-6274758	14N	1900 m
CP	CLCP-Aqua-300	Unnamed Wetland	Site: 40 to 41	E-798893 N- 6274728	E-429885 N-6274679	14N	812 m

Potential Effects: [4]

Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; damage to stream banks; loss of riparian vegetation

Specific Mitigation: [5] *

- Use existing trails, roads or cut lines whenever possible as access routes

ESS Group : Birds and Habitat[2]

Sec ID	ESS ID	ESS Name	Location	Start	Stop	UTM Zone
CP	CP-Wild-100	Limestone River - movement route for waterfowl and raptors	-	E–799006 N-6274189	-	14N
CL	CL-Wild-100	Limestone River - movement route for waterfowl and raptors	Site: L46 to L47	E–429753 N-6263725	E–429551 N-6263754	14N

Potential Effects: [4]

CP-Wild-100, CL-Wild-100: *Higher risk of wire collision; risk of wire collision is localized to the right-of-way*

Specific Mitigation: [5] *

- Adhere to timing windows for protection of birds
- Maintain setback during timing window

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 number 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. C2) 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 preferred route or 66m 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)	C2-Acss-100
Ecosystem	Habitat (100)	C2-Eco-100
	Research (200)	C2-Eco-200
	Species of Concern (300)	C2-Eco-300
Heritage	Archaeological (100)	C2-Hert-100
	Cultural (200)	C2-Hert-200
	Historic (300)	C2-Hert-300
Land Use	Conservation (100)	C2-LUse-100
	Crown Land Encumbrance (200)	C2-LUse-200
	Recreation (300)	C2-LUse-300
	Residential (400)	C2-LUse-400
Resource Use	Agriculture (100)	C2-RUse-100
	Food/Medicinal (200)	C2-RUse-200
	Forestry (300)	C2-RUse-300
	Hunting/Fishing (400)	C2-RUse-400
	Trapping (500)	C2-RUse-500
Soils and Terrain	Permafrost (100-200)	C2-Soils-100
	Erosion (300)	C2-Soils-300
	Terrain (400)	C2-Soils-400
Water	Water Crossing (100)	C2-Aqua-100
	Groundwater (200)	C2-Aqua-200
	Wetlands (300)	C2-Aqua-300
Wildlife	Birds and Habitat (100)	C2-Wild-100
	Mammal and Habitat (200)	C2-Wild-200
	Reptiles/Amphibians and Habitat (300)	C2-Wild-300

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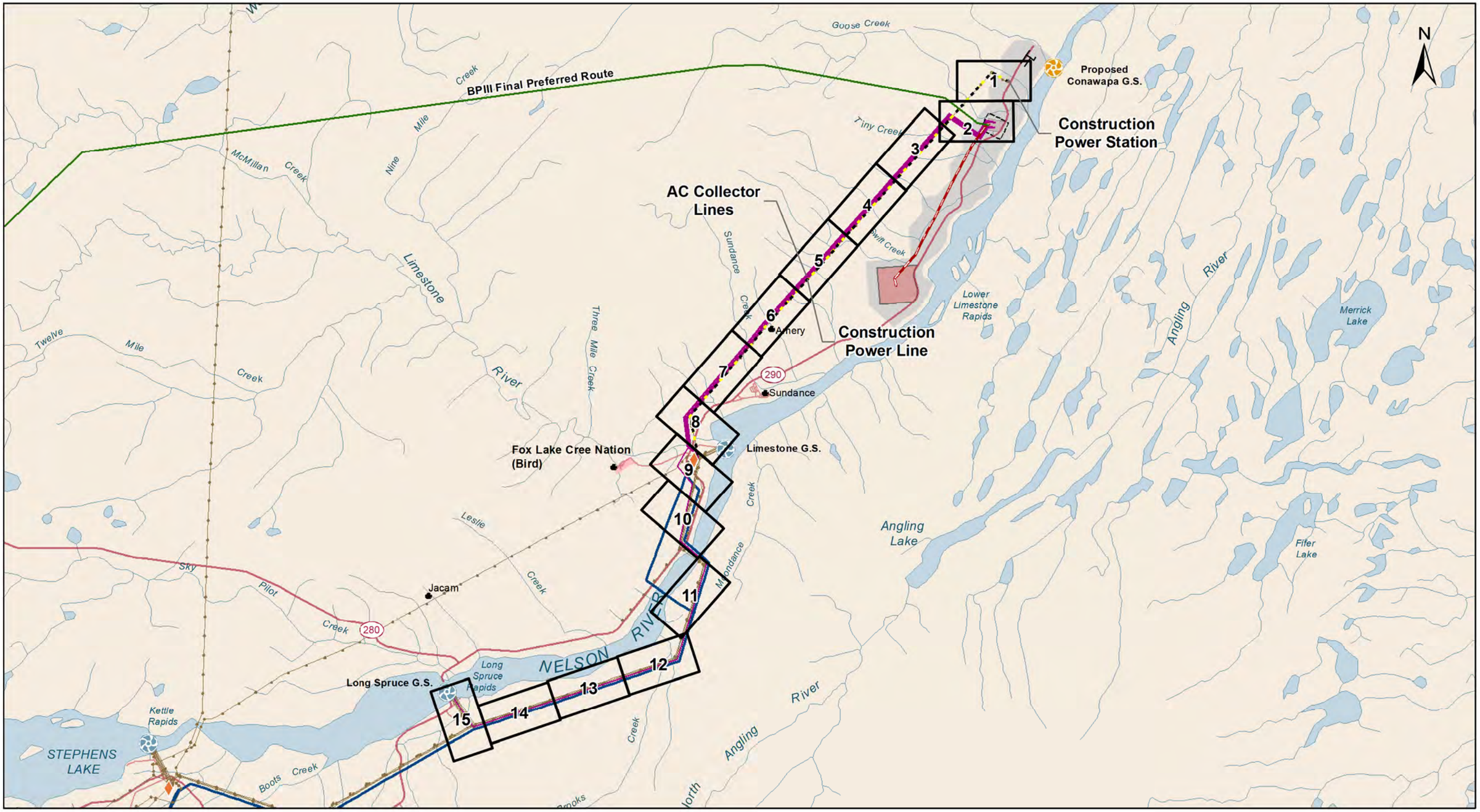

Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: May 04, 2015

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Kilometres
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Land Base
- Provincial Highway
- Provincial Road
- Watercourse
- Waterbody

Project Infrastructure
- Existing Converter Stations
- Proposed G.S.
- Existing G.S.
- BPIII FPR Construction Section
- Construction Power (KN36)
- AC Collector Line
- Transmission Line
- Bipole I & II
- Ground Electrode Line
- Ground Electrode
- Keewatinohk Converter Station
- Construction Power Station
- Keewatinohk Work Area

Bipole III Transmission Project
Construction Environmental Protection Plan
AC Collector Lines, Construction Power Line and Station Key Map Index

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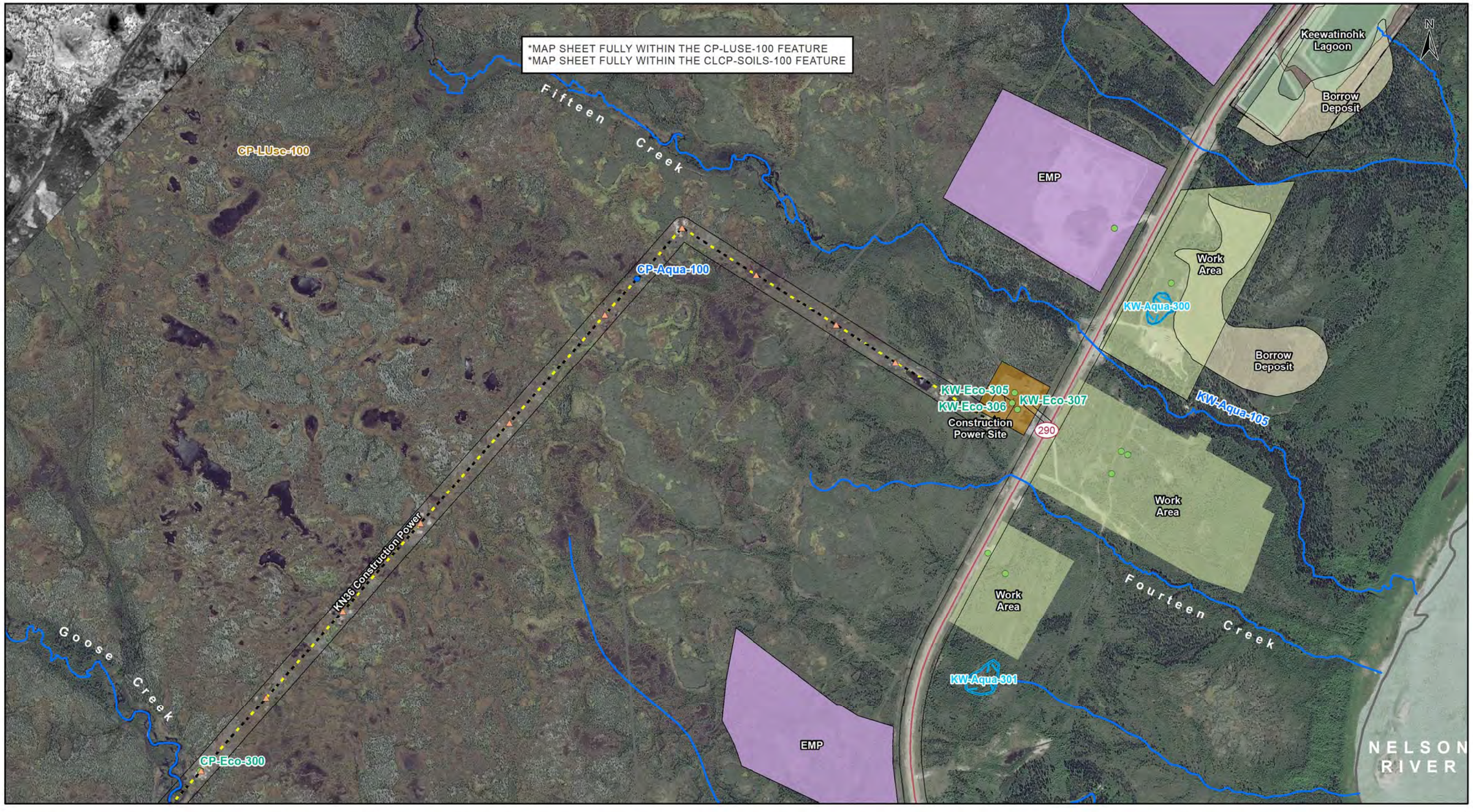

Manitoba Hydro

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: November 15, 2016
Version: Final 4.0

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Metres
1:10,000

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

Project Infrastructure
- BPIII Final Preferred Route
- Ground Electrode Line
- Construction Power Line
- Borrow Deposits
- Excavated Material Placement Area
- Keewatinohk Converter Station
- Ground Electrode
- Manitoba Hydro & Contractor Work Area
- Access Road Security Gatehouse
- Preliminary Tower Location

ESS Legend

BPIII ESS - Points
- Ecosystem
  - Species of Concern
- Water
  - Water Crossing

BPIII ESS - Lines
- Water
  - Water Crossing

BPIII ESS - Poly
- Land Use
  - Conservation

Water
- Water Crossing

Bipole III Transmission Project
Construction Environmental Protection Plan
AC Collector Lines, Construction Power Line and Station Environmentally Sensitive Site Locations

Map 1

ESS Group: Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing
CP Site	KW-Eco-305	Species of Concern (plant)	816146	6293427
CP Site	KW-Eco-306	Species of Concern (plant)	816139	6293400
CP Site	KW-Eco-307	Species of Concern (plant)	816153	6293382

Potential Effects:

Loss of plants of conservation concern from clearing and construction activities.

Specific Mitigation:

- Non-mitigable due to complete removal of all vegetation cover for site.

ESS Group: Conservation

Sec ID	ESS ID	ESS Name	Location	Start	Stop
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 1	-	-

Potential Effects:

Within the 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 (non-hazardous domestic waste) must be stored in wildlife 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: Water Crossing

Sec ID	ESS ID	ESS Name	Easting	Northing	Channel Width (m)	Wet Width (m)	Fish Habitat Class	Habitat Sensitivity
CP	CP-Aqua-100	Unnamed Tributary of Nelson River	815112	6293739	N/A	N/A	Marginal	Moderate

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 vegetation will be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.
- Adhere to Department of Fisheries and Oceans (DFO) Operational Statements for Temporary Stream Crossings, Ice Bridges and Snow Fills, and Overhead Line Construction
- No instream works or fording from April 15 - July 15

ESS Group: Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing
CP	CP-Eco-300	Species of Concern (plant)	813918	6292393

Potential Effects:

Potential loss of plants of conservation concern from clearing, construction, maintenance and decommissioning activities.

Specific Mitigation:

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Provide 5m vegetated (shrub and herbaceous) buffer around site
- Remove trees by hand or other low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible

ESS Group: Permafrost

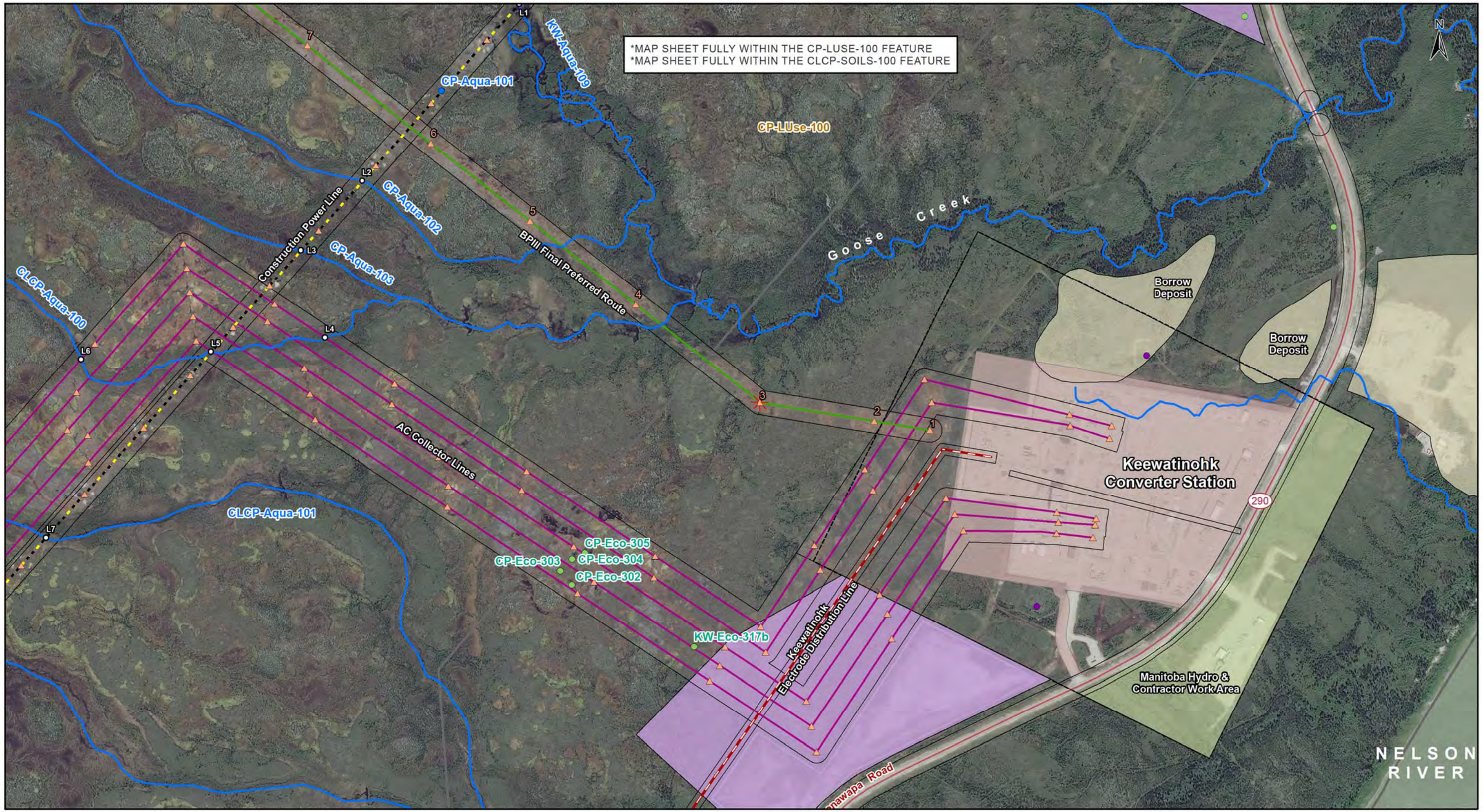
Sec-Seg ID	ESS ID	ESS Name
CLCP	CLCP-Soils-100	Permafrost

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 >3m 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

Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: November 15, 2016
Version: Final 4.0

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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
- Provincial Forest

Project Infrastructure
- BPIII Final Preferred Route
- Ground Electrode Line
- Construction Power Line
- Borrow Deposits
- Excavated Material Placement Area
- Keewatinohk Converter Station
- Ground Electrode
- Manitoba Hydro & Contractor Work Area
- Access Road Security Gatehouse
- Preliminary Tower Location

ESS Legend

BPIII ESS - Points
Ecosystem
- Species of Concern
Heritage
- Archaeological
Water
- Water Crossing

BPIII ESS - Lines
Water
- Water Crossing

BPIII ESS - Poly
Land Use
- Conservation

Bipole III Transmission Project
Construction Environmental Protection Plan
AC Collector Lines, Construction Power Line and Station Environmentally Sensitive Site Locations

Map 2

ESS Group: Conservation

Sec ID	ESS ID	ESS Name	Location	Start	Stop
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 2	-	-

Potential Effects:

Within the 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 (non-hazardous domestic waste) must be stored in wildlife 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: Water Crossing

Sec ID	ESS ID	ESS Name	Location	Easting	Northing	Channel Width (m) (m)	Wet Width (m) (m)	Fish Habitat Class	Habitat Sensitivity
KW	KW-Aqua-109	Goose Creek	L1	813837	6292299	13	13	Important	Moderate
CP	CP-Aqua-101	Unnamed Tributary of Goose Creek	-	813597	6292028	N/A	N/A	Marginal	Moderate
CP	CP-Aqua-102	Unnamed Tributary of Goose Creek	L2	813410	6291816	N/A	3	Marginal	Moderate
CP	CP-Aqua-103	Unnamed Tributary of Goose Creek	L3	813243	6291628	N/A	N/A	Marginal	Moderate
CLCP	CLCP-Aqua-100	Unnamed Tributary of Goose Creek	L4 (CL East)	813309	6291391	N/A	N/A	Marginal	Moderate
CLCP	CLCP-Aqua-100	Unnamed Tributary of Goose Creek	L5 (CP)	813000	6291353	N/A	N/A	Marginal	Moderate
CLCP	CLCP-Aqua-100	Unnamed Tributary of Goose Creek	L6 (CL West)	812648	6291332	N/A	N/A	Marginal	Moderate
CLCP	CLCP-Aqua-101	Unnamed Tributary of Tiny Creek	Site: L7 to L8	E-812552 N-6290847	E-812260 N-6290895	N/A	N/A	Marginal	Moderate

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 vegetation will be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.
- Adhere to Department of Fisheries and Oceans (DFO) Operational Statements for Temporary Stream Crossings, Ice Bridges and Snow Fills, and Overhead Line Construction
- No instream works or fording from April 15 - July 15

ESS Group: Permafrost

Sec-Seg ID	ESS ID	ESS Name
CLCP	CLCP-Soils-100	Permafrost

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 >3m 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: Species of Concern

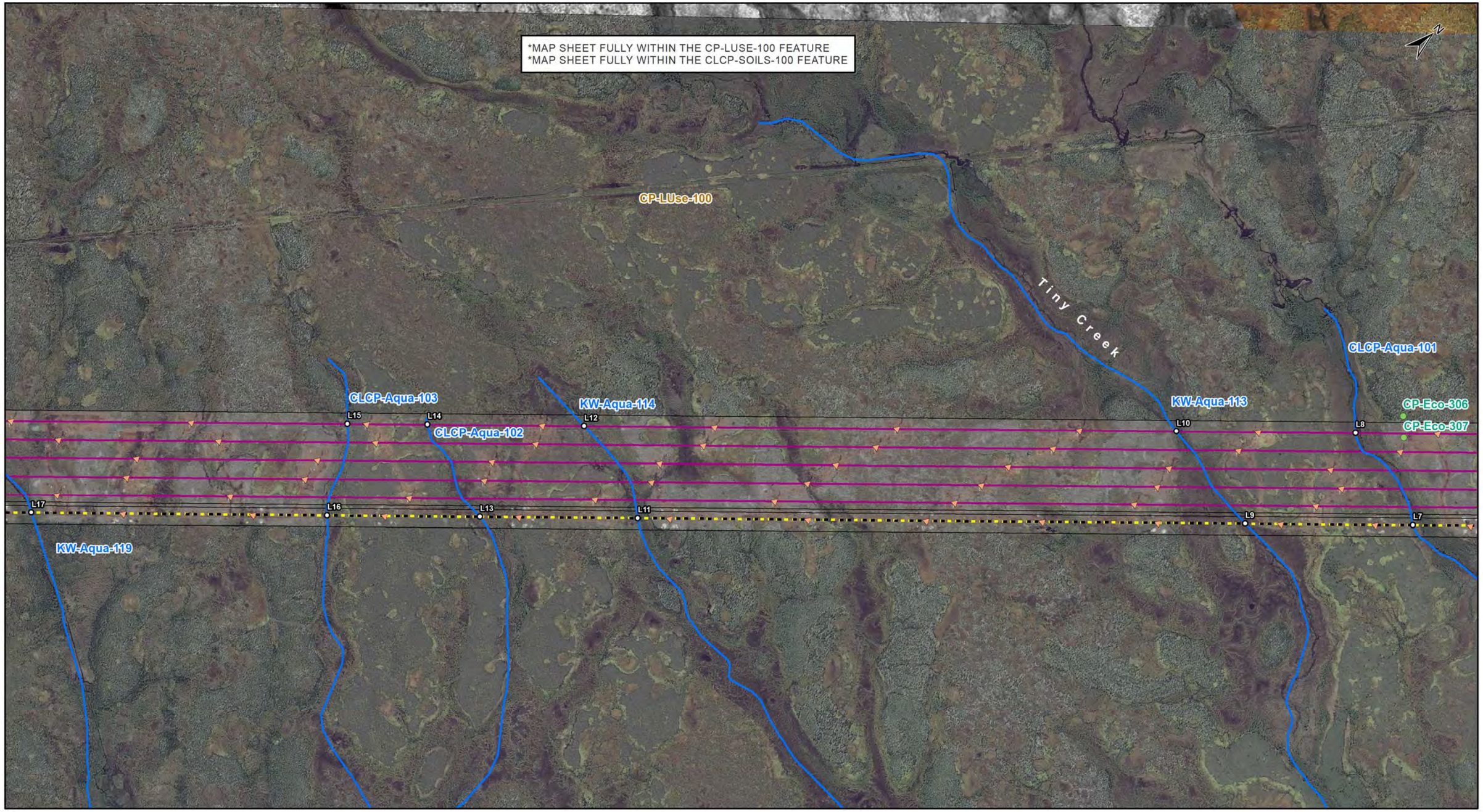
Sec ID	ESS ID	ESS Name	Easting	Northing
CP	CP-Eco-302	Species of Concern (plant)	813979	6290718
CP	CP-Eco-303	Species of Concern (plant)	813948	6290756
CP	CP-Eco-304	Species of Concern (plant)	813980	6290788
CP	CP-Eco-305	Species of Concern (plant)	814014	6290805
KW	KW-Eco- 317b	Species of Concern (plant)	814311	6290550

Potential Effects:

Potential loss of plants of conservation concern from clearing, construction, maintenance and decommissioning activities.

Specific Mitigation:

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Provide 5m vegetated (shrub and herbaceous) buffer around site
- Remove trees by hand or other low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible



Manitoba Hydro

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Metres
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Land Base
- Transmission Line
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Project Infrastructure
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- Access Road Security Gatehouse
- Preliminary Tower Location

ESS Legend

BPIII ESS - Points
Ecosystem
- Species of Concern

BPIII ESS - Lines
Water
- Water Crossing

BPIII ESS - Poly
Land Use
- Conservation

Bipole III Transmission Project
Construction Environmental Protection Plan
AC Collector Lines, Construction Power Line and Station Environmentally Sensitive Site Locations

Map 3

ESS Group: Conservation

Sec ID	ESS ID	ESS Name	Location	Start	Stop
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 3	-	-

Potential Effects:

Within the 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 (non-hazardous domestic waste) must be stored in wildlife 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: Water Crossing

Sec ID	ESS ID	ESS Name	Location	Start	Stop	Channel Width (m)	Wet Width (m)	Fish Habitat Class	Habitat Sensitivity
CLCP	CLCP-Aqua-101	Unnamed Tributary of Tiny Creek	Site: L7 to L8	E-812552 N-6290847	E-812260 N-6290895	N/A	N/A	Marginal	Moderate
CLCP	KW-Aqua-113	Tiny Creek	Site: L9 to L10	E-812250 N-6290506	E-811938 N-6290530	N/A	11	Marginal	Moderate
CLCP	KW-Aqua-114	Unnamed Tributary of Nelson River	Site: L11 to L12	E-811155 N-6289269	E-810870 N-6289324	N/A	N/A	Marginal	Moderate
CLCP	CLCP-Aqua-102	Unnamed Tributary of Swift Creek	Site: L13 to L14	E-810871 N-6288948	E-810588 N-6289006	N/A	N/A	Marginal	Moderate
CLCP	CLCP-Aqua-103	Unnamed Tributary of Swift Creek	Site: L15 to L16	E-810444 N-6288842	E-810596 N-6288637	N/A	N/A	Marginal	Moderate
CLCP	KW-Aqua-119	Unnamed Tributary of Swift Creek	Site: L17 to L18	E-810064 N-6288036	E-809752 N-6288062	N/A	N/A	Marginal	Moderate

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 vegetation will be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.
- Adhere to Department of Fisheries and Oceans (DFO) Operational Statements for Temporary Stream Crossings, Ice Bridges and Snow Fills, and Overhead Line Construction
- No instream works or fording from April 15 - July 15

ESS Group: Permafrost

Sec-Seg ID	ESS ID	ESS Name
CLCP	CLCP-Soils-100	Permafrost

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 >3m 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: Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing
CP	CP-Eco-306	Species of Concern (plant)	812309	6291022
CP	CP-Eco-307	Species of Concern (plant)	812355	6290984

Potential Effects:

Potential loss of plants of conservation concern from clearing, construction, maintenance and decommissioning activities.

Specific Mitigation:

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Provide 5m vegetated (shrub and herbaceous) buffer around site
- Remove trees by hand or other low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible