

October 18, 2023

Filed Electronically

Canada Energy Regulator
Suite 210, 517 Tenth Avenue SW
Calgary, Alberta T2R 0A8

Attention: Ramona Sladic, Secretary of the Commission

Dear Ramona Sladic:

**Re: NOVA Gas Transmission Ltd. (NGTL)
2022 Meter Stations and Laterals Abandonment Program (2022 Abandonment
Program or Program)
Program Update – Watercourse Crossing Isolations and Revised Response to
Information Request No. 1.4
File No.: OF-Fac-Gas-N081-2023-03 01**

On May 23, 2023, NGTL filed an application with the Canada Energy Regulator (CER or Commission), pursuant to section 241(1) of the *Canadian Energy Regulator Act* (CER Act) and section 45.1 of the *Canadian Energy Regular Onshore Pipeline Regulations* (OPR) for leave to abandon certain facilities on the NGTL System (Application).¹ As planning and engineering has progressed, NGTL has identified the following changes to its proposed abandonment plan and methodologies.

Removing Isolation Locations at Watercourse Crossings From Scope of Work

In its Application, NGTL had identified eight locations where it had proposed to isolate (cut and cap) immediately adjacent to either bank of a watercourse crossing. Since filing the Application NGTL further evaluated the engineering design and environmental setting for these proposed watercourse crossings and has determined that isolation at these locations is not warranted. As explained by NGTL in its response to CER Information Request No. 2.1 for the 2021 Meter Station and Laterals Abandonment Program,² potential long-term environmental effects due to abandonment in-place for the subject laterals are sufficiently mitigated without isolation in close proximity to riparian areas through sufficient segmentation at other locations on the pipeline lateral, as well as considering segmentation in relation to the topography of the full pipeline route. In addition, the removal of isolation locations minimizes disturbance in potentially environmentally sensitive areas (i.e., in proximity to watercourses) and reduces new disturbance that may be required for access to those isolation locations.

In support of this scope change, NGTL provides the following revised attachments to its Application. Changes are identified in the attached concordance table (Appendix A):

- a blackline Application Table 1: Facilities to be Abandoned (Appendix B)
- revised Attachment 2: Preliminary Schematics

¹ Filing ID: C24570, Table 1: Facilities to be Abandoned, PDF pages 8 to 12 of 67.

² Filing ID: C20154, PDF pages 2 to 6 of 29.

- a blackline Attachment 7: Interactions Table
- a blackline Attachment 8-1: Environmental Protection Plan
- a blackline and revised Attachment 8-2: Environmental Site Information Sheets

NGTL will notify landowners (including the Crown), Indigenous groups, and other land rightsholders (e.g., occupants, land users [trappers, grazing lease holders etc.] and industry parties) who are potentially impacted by the update to the isolation locations advising that physical Abandonment Activities will not be conducted at these locations.

NGTL continues to actively engage with all potentially affected stakeholders and Indigenous groups during all phases of the Program, and remains committed to sharing Program information, responding to questions and concerns and receiving feedback through its ongoing engagement efforts.

Update to Response to Information Request (IR) No. 1.4

In its response to IR No. 1.4, NGTL confirmed that five Program components associated with the Lennard Creek Receipt Meter Station and Lennard Creek Lateral (Lennard Creek RMS and Lateral) overlap with federally and provincially designated boreal caribou ranges. In addition, NGTL confirmed that a vegetation survey was anticipated for September within the caribou range and would be used in the development of the Caribou Habitat Restoration Plan (CHRP) and committed to submitting the CHRP to the CER on or before March 31, 2024.³

As a result of the wildfires within the area of Lennard Creek RMS and Lateral restricting access to site locations requiring survey and limiting seasonal conditions approaching (onset of winter and senescence of non-woody vegetation), NGTL has been unable to conduct in-field vegetation surveys within caribou range. These vegetation surveys must be conducted in snow-free conditions, and ideally during leaf-on conditions to facilitate species identification.

NGTL will endeavor to complete field work at the earliest opportunity in 2024, preferably in Q2 if permitted; plan in the alternative, before the end of Q3. Once field vegetation surveys are completed NGTL will provide a CHRP to the CER as soon as feasible.

If the CER requires additional information with respect to this filing, please contact me by phone at (403) 920-2940 or by email at nicole_prince@tcenergy.com.

Yours truly,
NOVA Gas Transmission Ltd.

Original signed by

Nicole Prince
Regulatory Project Manager,
Regulatory Facilities, Canadian Natural Gas Pipelines

Attachments

cc. Rebecca Verrall, Canada Energy Regulator
Blair Riley, Canada Energy Regulator

³ Filing ID: C25814; PDF page 15 of 110.

Appendix A

Concordance Table of Changes

Concordance Table

Source	Subsection	Page of Source	Change	Justification
Application	Table 1: Facilities to be Abandoned		Revised additional isolation locations column for: <ul style="list-style-type: none"> • Bigstone Lateral • Minburn Lateral • Osborn Lake Lateral • Pioneer East Lateral • Pioneer East Lateral Loop • Ukalta Lateral 	Removal of watercourse isolation locations
Attachment 2: Preliminary Schematics	N/A	PDF page 5 of 30	Revised Bigstone Lateral (page 1 of 2) Schematic	Removal of watercourse isolation locations
		PDF page 15 of 30	Revised Minburn Lateral Schematic	
		PDF page 16 of 30	Revised Osborn Lake Lateral Schematic	
		PDF page 17 of 30	Revised Pioneer East Lateral and Loop Schematic	
		PDF page 18 of 30	Revised Ranfurly Meter Station Producer Tie-In Schematic	
		PDF page 27 of 30	Revised Ukalta Schematic	
Attachment 7: Interactions Table	Water Quality and Quantity	Page 16 of 43	Revised within the Description of Interaction(s) (If no interaction is predicted, provide justification) column: <ul style="list-style-type: none"> • '22' PDAs to '14' PDAs Removed: <ul style="list-style-type: none"> • 'eight isolation points and' 	Removal of watercourse isolation locations
	Fish and Fish Habitat	Page 18 of 43	Removed within the Description of Interaction(s) (If no interaction is predicted, provide justification) column: <ul style="list-style-type: none"> • 'eight isolation points and' 	Removal of watercourse isolation locations

Concordance Table

Source	Subsection	Page of Source	Change	Justification
Attachment 7: Interactions Table (cont'd)	Refer to previous page	Refer to previous page	<ul style="list-style-type: none"> one fish species (rainbow trout) listed as "endangered" on Schedule 1 of <i>Species at Risk Act</i> as well as by COSEWIC, and "at risk" under the <i>Alberta Wildlife Act</i>, at one isolation point. two fish species (arctic grayling and spoonhead sculpin) listed as "may be at risk" under the <i>Alberta Wildlife Act</i> at the same isolation point 	Refer to previous page
Attachment 8.1: Environmental Protection Plan	Section 3.2 Environmental Setting	PDF page 8 of 201	Removal of reference to 'eight isolation points'	Removal of watercourse isolation locations
	Table 2: Project-Specific Mitigation Measures	PDF page 23 of 201	Removal of locations: <ul style="list-style-type: none"> BIGS12_04WC_1 BIGS12_04WC_2 BIGS12_05WC_1 BIGS12_05WC_2 	Removal of watercourse isolation locations
		PDF page 26 of 201	Removal of locations: <ul style="list-style-type: none"> UKAL6_03WC_1 UKAL6_03WC_2 	
		PDF page 29 of 201	Removal of locations: <ul style="list-style-type: none"> BIGS12_04WC_1 BIGS12_04WC_1 BIGS12_05WC_1 BIGS12_05WC_2 	
		PDF page 30 of 201	Removal of locations: <ul style="list-style-type: none"> RANF12PT_02WC_1 RANF12PT_02WC_2 RANF12PT_03WC 	

Concordance Table

Source	Subsection	Page of Source	Change	Justification
Attachment 8.1: Environmental Protection Plan (cont'd)	Table 3: Summary of Watercourses within 30 m of Program Components	PDF page 51 of 201	Removal of watercourses/waterbodies: <ul style="list-style-type: none"> • Tributary to Smoke Lake 1 (TSL1) • Tributary to Smoke Lake 2 (TSL2) • Tributary to Smoke Lake 2 (TSL2) • Tributary to Manatokan Lake (TML) • Brich Creek • Carrot Creek • Egg Creek 	Removal of watercourse isolation locations
Attachment 8-2: Environmental Site Information Sheets	Table: Wildlife Species at Risk or Species of Management of Concern	PDF page 3 of 82	Removal of PDAs in Mapped Range: <ul style="list-style-type: none"> • OSB03 • OBS04 • UKA04 • UKA04.5 • MIN05 • MIN06 • RAN02 • RAN02.5 • BIG10 • BIG10.5 • BIG12 • BIG12.5 • PIO03 • PIO03.5 	Removal of watercourse isolation locations
		Original file pages 12 to 13		
		Original file pages 31 and 32		
		Original file pages 35 to 36		

Concordance Table

Source	Subsection	Page of Source	Change	Justification
Attachment 8-2: Environmental Site Information Sheets (cont'd)	Refer to previous page	Original file pages 41 and 42		Refer to previous page
		Original file pages 45 and 46		
		Original file pages 70 and 71		

Appendix B

Revised Application Table 1: of Facilities to be Abandoned

Revised Table 1: Facilities to be Abandoned

Meter Station Details		Lateral Pipeline Details					Lateral Abandonment Method ¹	Proposed Abandonment Date ²
Name	Legal Subdivisions (LSD)	Name	Diameter (NPS)	Approximate Length (km)	Start Point LSD	End Point LSD		
			Diameter (mm)		Additional Isolation Excavation Site(s) LSD(s)			
N/A	---	AECO C Lateral	8	6.78 ³	SE 02-019-10 W4M	SE 03-019-09 W4M	In-place	Q3 2024
			219.1		SW 04-019-09 W4M			
N/A	---	AECO C Lateral Loop (heavier wall)	12	2.56	SE 02-019-10 W4M	SW 05-019-09 W4M	In-place / Remove ⁴	Q3 2024
			323.9		None			
N/A	---	AECO C Lateral Loop (light wall)	12	4.26	SW 05-019-10 W4M	SE 04-019-09 W4M		
			323.9		None			
Ansell Receipt	SE 29-053-17 W5M	N/A	---	---	---	---	---	---
Bailey's Bottom Receipt	SE 21-007-22 W4M	N/A	---	---	---	---	---	Q4 2024
N/A	---	Bigstone Lateral	12	11.63	NW 14-061-19 W5M	SW 15-061-20 W5M	In-place	Q3 2024
			323.9		SW 18-061-19 W5M (Watercourse Crossing) SE 17-061-19 W5M (Watercourse Crossing) SW 15-061-20 W5M (Railway Crossing)			
		Bigstone Lateral	12	0.29 ⁵	SE 10-061-22 W5M	SE 10-061-22 W5M	Remove	Q3 2024
			323.9		None			
Bruce Receipt	SW 06-047-15 W4M	Bruce Lateral	8	0.12	SE 06-047-15 W4M	SW 06-047-15 W4M	Remove	Q4 2024
			219.1		None			
Bruce North Receipt	SW 01-048-15 W4M	Bruce North MS Producer Tie-In (PTI)	4	1.24	SW 01-048-15 W4M	NE 01-048-15 W4M	In-place	Q4 2024
			114.3		None			
		Bruce North Lateral	4	5.70	SE 05-048-15 W4M	SW 01-048-15 W4M	In-place	Q4 2024
			114.3		None			

Revised Table 1: Facilities to be Abandoned (cont'd)

Meter Station Details		Lateral Pipeline Details					Lateral Abandonment Method ¹	Proposed Abandonment Date ²
Name	Legal Subdivisions (LSD)	Name	Diameter (NPS)	Approximate Length (km)	Start Point LSD	End Point LSD		
			Diameter (mm)		Additional Isolation Excavation Site(s) LSD(s)			
Josephine Receipt	NW 36-082-10 W6M	Josephine MS PTI	10	1.17	NW 36-082-10 W6M	NE 01-083-10 W6M	In-place	Q1 2025
			273.1		None			
Kehiwin Receipt	SE 25-059-07 W4M	N/A	---	----	---	----	---	Q3 2024
Kemp River Receipt	SE 28-102-03 W6M	N/A	---	---	---	---	---	Q4 2025
Lennard Creek Receipt	NW 23-107-06 W6M	Lennard Creek Lateral	6	8.80	NE 14-108-06 W6M	NW 23-107-06 W6M	In-place	Q2 2025
			168.3		None			
Louisiana Lake Receipt	SW 03-018-11 W4M	Louisiana Lake MS PTI	6	0.06	SE 04-018-11 W4M	SW 03-018-11 W4M	Remove	Q3 2024
			168.3		None			
		Louisiana Lake Lateral	6	11.70	SW 02-018-10 W4M	SW 03-018-11 W4M	In-place / Remove ⁶	Q3 2024
			168.3		None			
Louisiana Lake Lateral Loop	4	11.70	SW 02-018-10 W4M	SW 03-018-11 W4M	In-place	Q3 2024		
	114.3		None					
Maddenville Receipt	SE 15-063-25 W5M	N/A	---	---	---	---	---	Q1 2025
Minburn Receipt	SE 24-051-10 W4M	Minburn Lateral	4	9.30	NE 24-050-10 W4M	SE 24-051-10 W4M	In-place	Q3 2024
			114.3		SW 06-051-09 W4M and NE 36-050-10 W4M (Watercourse Crossing) None			
Osborne Lake Receipt	NE 01-064-07 W4M	Osborne Lake Lateral	6	7.37	SW 05-064-07 W4M	NE 01-064-07 W4M	In-place	Q3 2024
			168.3		SW 02-064-07 W4M and SE 02-064-07 W4M (Watercourse Crossing) SE 04-064-07 W4M and SW 03-064-07 W4M (Road Crossing)			

Revised Table 1: Facilities to be Abandoned (cont'd)

Meter Station Details		Lateral Pipeline Details					Lateral Abandonment Method ¹	Proposed Abandonment Date ²
Name	Legal Subdivisions (LSD)	Name	Diameter (NPS)	Approximate Length (km)	Start Point LSD	End Point LSD		
			Diameter (mm)		Additional Isolation Excavation Site(s) LSD(s)			
Pioneer East Receipt	NE 16-055-13 W5M	Pioneer East Lateral	4	10.38	SW 26-054-14 W5M	NE 16-055-13 W5M	In-place	Q2 2025
			114.3		SE 35-054-14 W5M (Watercourse Crossing) None			
		Pioneer East Lateral Loop	8	10.38	SW 26-054-14 W5M	NE 16-055-13 W5M	In-place	Q2 2025
			219.1		SE 35-054-14 W5M (Watercourse Crossing) None			
Ranfurly Receipt ⁷	SE 28-050-09 W4M	Ranfurly MS PTI	12	0.41 ⁸	SW 27-050-09 W4M	SE 28-050-09 W4M	In-place	Q3 2025
			323.9		SW 27-050-09 W4M (Watercourse Crossing) None			
Rochester Receipt	NE 27-062-24 W4M	Rochester Lateral ⁹	4	6.11	SW 09-062-24 W4M	NE 27-062-24 W4M	In-place	Q3 2025
			114.3		SE 21-062-24 W4M and NE 16-062-24 W4M (Highway Crossing)			
Scotfield Receipt	NW 16-030-10 W4M	Scotfield Lateral	4	1.06	SW 21-030-10 W4M	NW 16-030-10 W4M	In-place	Q3 2024
			114.3		None			
Sedgewick East Receipt	NW 23-043-11 W4M	N/A	---	---	---		---	Q4 2024
Silver Valley Sales	NE 22-081-11 W6M	Silver Valley Lateral	6	16.50	NW 20-081-09 W6M	NE 22-081-11 W6M	In-place	Q1 2025
			168.3		NW 23-081-11 W6M and NE 22-081-11 W6M (Highway Crossing)			
N/A	---	Simonette MS PTI	8	0.33	NE 06-063-25 W5M	NW 05-063-25 W5M	In-place	Q1 2025
			219.1		None			
N/A	---	Tide Lake MS PTI	4	0.69	NE 10-018-10 W4M	SW 14-018-10 W4M	In-place	Q2 2025
			114.3		None			

Revised Table 1: Facilities to be Abandoned (cont'd)

Meter Station Details		Lateral Pipeline Details					Lateral Abandonment Method ¹	Proposed Abandonment Date ²
Name	Legal Subdivisions (LSD)	Name	Diameter (NPS)	Approximate Length (km)	Start Point LSD	End Point LSD		
			Diameter (mm)		Additional Isolation Excavation Site(s) LSD(s)			
N/A	---	Tide Lake North Lateral	67	0.64	SE 26-019-10 W4M	NW 23-019-10 W4M	In-place	Q1 2025
			168.3		None			
N/A	---	Tilliebrook MS PTI	6	0.58	NW 20-018-13 W4M	NE 20-018-13 W4M	In-place	Q4 2025
			168.3		None			
Ukalta Receipt	SE 25-057-17 W4M	Ukalta Lateral	6	10.30	NW 31-057-15 W4M	SE 25-057-17 W4M	In-place	Q3 2024
			168.3		SW 30-057-16 W4M; NE 30-057-16 W4M (Watercourse Crossing) NW 29-057-16 W4M; NE 29-057-16 W4M; NW 28-057-16 W4M; SE 33-057-16 W4M; SW 34-057-16 W4M; SE 34-057-16 W4M; SW 35-057-26 W4M; NE 35-057-16 W4M; NW 36-057-16 W4M			
Ukalta East Receipt	NE 35-057-16 W4M	Ukalta Lateral Loop	6	2.66	NW 31-057-15 W4M	NE 35-057-16 W4M	In-place	Q3 2024
			168.3		NW 36-057-16 W4M			
Viking North Receipt	NW 31-049-13 W4M	Viking North Lateral	4	6.18	SE 04-050-13 W4M	SW 36-049-14 W4M	In-place	Q2 2025
			114.3		None			
Weasel Creek Receipt	NW 06-060-19 W4M	Weasel Creek Lateral	4	2.97	NW 30-059-19 W4M	NW 06-060-19 W4M	In-place	Q4 2024
			114.3		SW 06-060-19 W4M and NW 31-059-19 W4M (Highway Crossing)			
Whitford Receipt	SE 20-056-15 W4M	Whitford Lateral	6	2.03	SW/NW 22-056-15 W4M	SE 20-056-15 W4M	In-place	Q3 2024
			168.3		SW 21-056-15 W4M and SE-21-056-15 W4M (Highway and Railway Crossing)			

Revised Table 1: Facilities to be Abandoned (cont'd)

NOTES:

The Facilities proposed to be abandoned transported sweet natural gas that meets NGTL's Gas Quality Specifications outlined in its Tariff, General Terms and Conditions, Article 3, Gas Quality.

¹ Where small portions of a lateral may be located within the meter station boundaries, those portions of the pipeline will be removed as part of the meter station.

² Schedule is subject to change pending Regulatory approval and further consultation with landowners and consideration of any environment restricted activity periods (RAPs), to avoid and/or minimize potential impacts on the environment.

³ Approximately 0.03 km of the AECO C Lateral from the AECO C meter station to the producer will remain in-service. The remaining 6.81 km will be abandoned in-place.

⁴ Approximately 0.01 km of the AECO C Lateral Loop will be removed where the pipeline connects to the AECO C RMS and the NPS 16 Tide Lake Lateral Loop Extension. The remaining approximately 7.19 km of the pipeline will be abandoned in-place.

⁵ Approximately 0.29 km of the 17.18 km of this section of the Bigstone Lateral will be abandoned by removal. The remaining 16.89 km will remain in-service.

⁶ Approximately 0.03 km of the Louisiana Lake Lateral will be removed where the pipeline connects to the NPS 16 Tide Lake Lateral Loop Extension and the NPS 10 Tide Lake Lateral. The remaining approximately 11.68 km will be abandoned in-place.

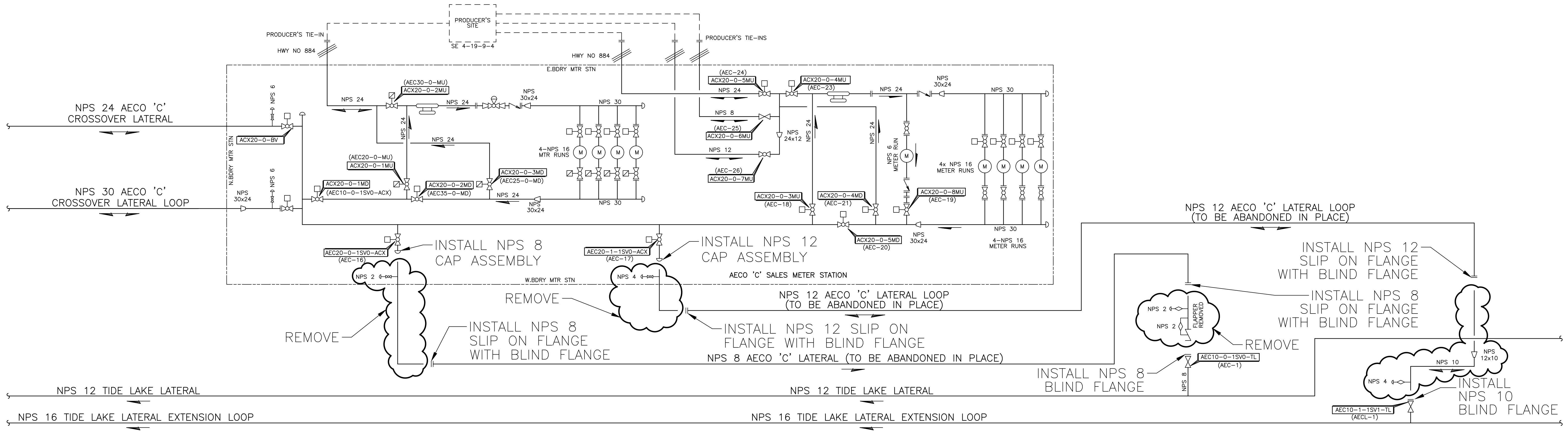
⁷ The Ranfurly RMS is co-located and would qualify for decommissioning under the CER's DEO; however, the Ranfurly MS PTI falls under Abandonment. Decommissioning of the Ranfurly RMS would cause the Ranfurly MS PTI to become a stranded asset, and therefore both facilities are being included in the Abandonment Application for efficiencies and bundling purposes.

⁸ Schedule A of Certificate GC-113, as amended, lists the length of the Ranfurly MS PTI as 0.10 km. NGTL as confirmed through review of internal GIS data and alignment sheets that the length is approximately 0.41 km

⁹ Approximately 6.11 km of the 14.32 km Rochester Lateral will be abandoned in-place, while the remaining approximately 8.10 km will be decommissioned in-place, in a subsequent application, as it parallels the active Rochester Lateral Loop. The remaining approximately 10 m will remain in-service from the Armstrong RMS to the Rochester Lateral Loop.

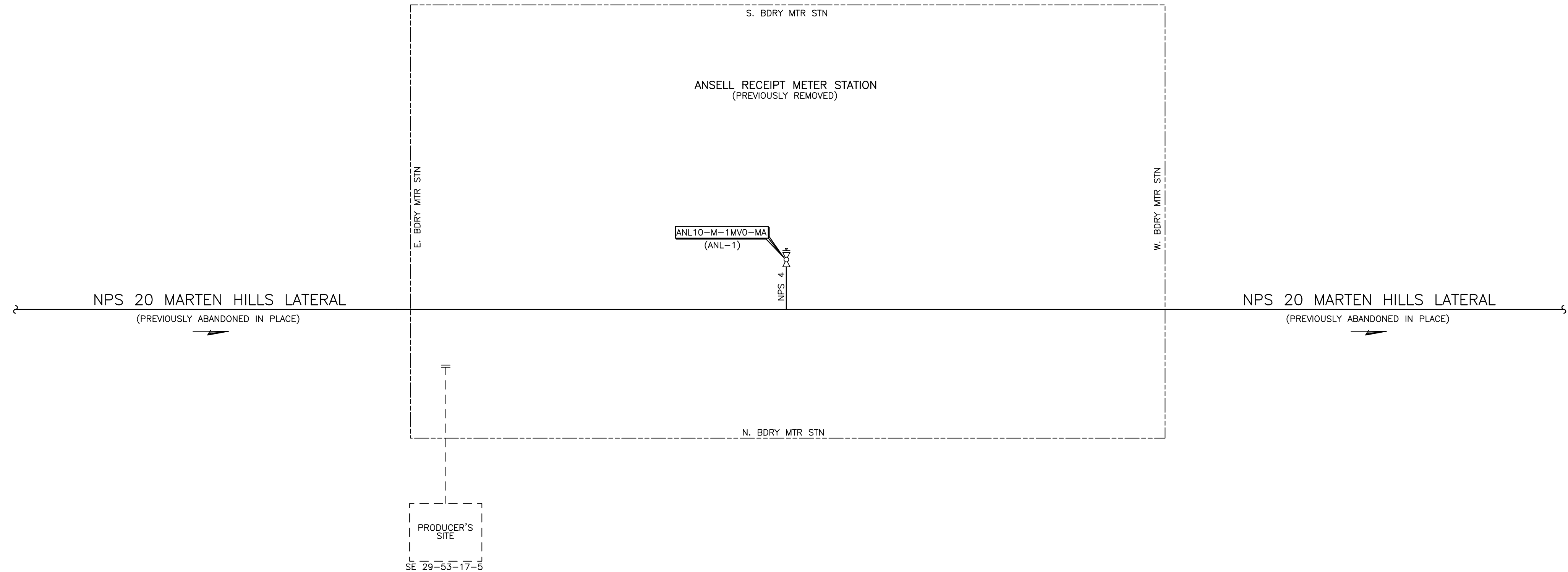
Revised Attachment 2: Schematics

NPS 8 AECO 'C' LATERAL AND NPS 12 AECO 'C' LATERAL LOOP



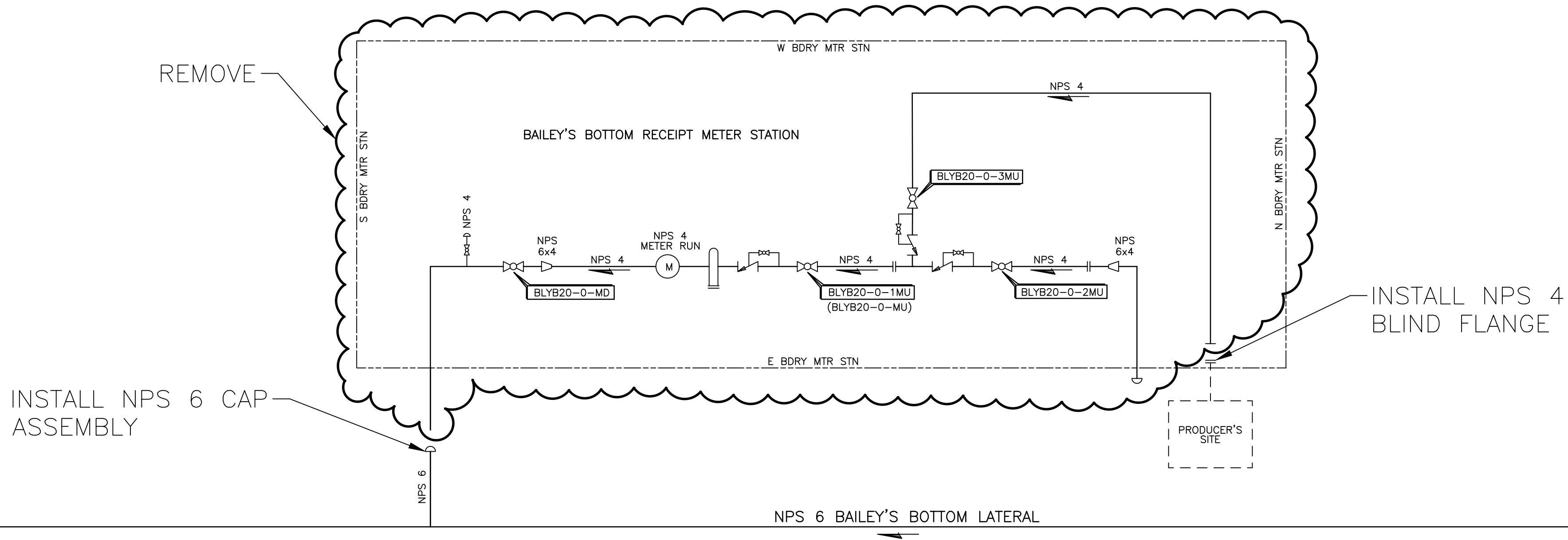
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ANSELL RECEIPT METER STATION



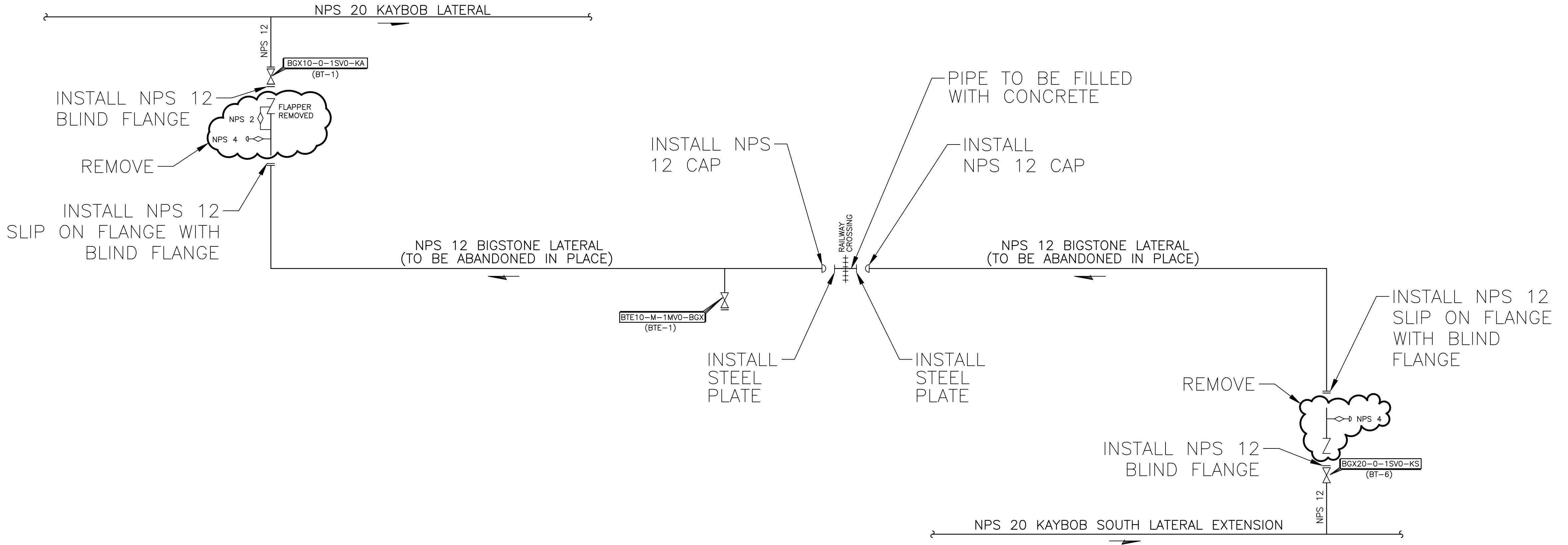
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BAILEY'S BOTTOM RECEIPT METER STATION



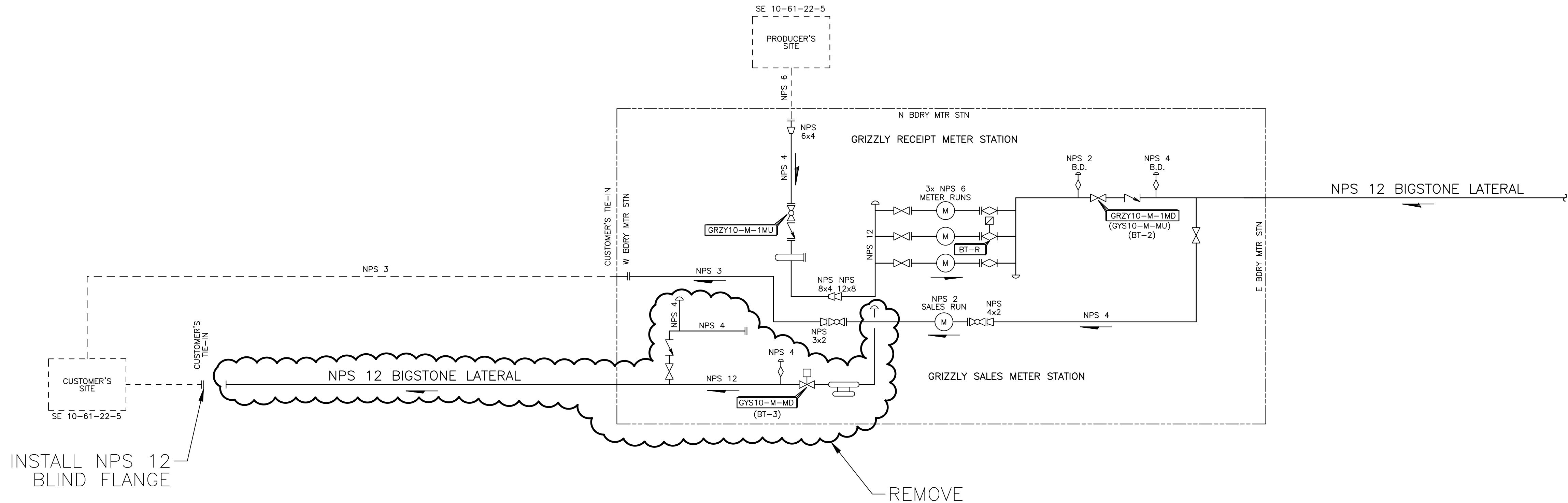
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NPS 12 BIGSTONE LATERAL



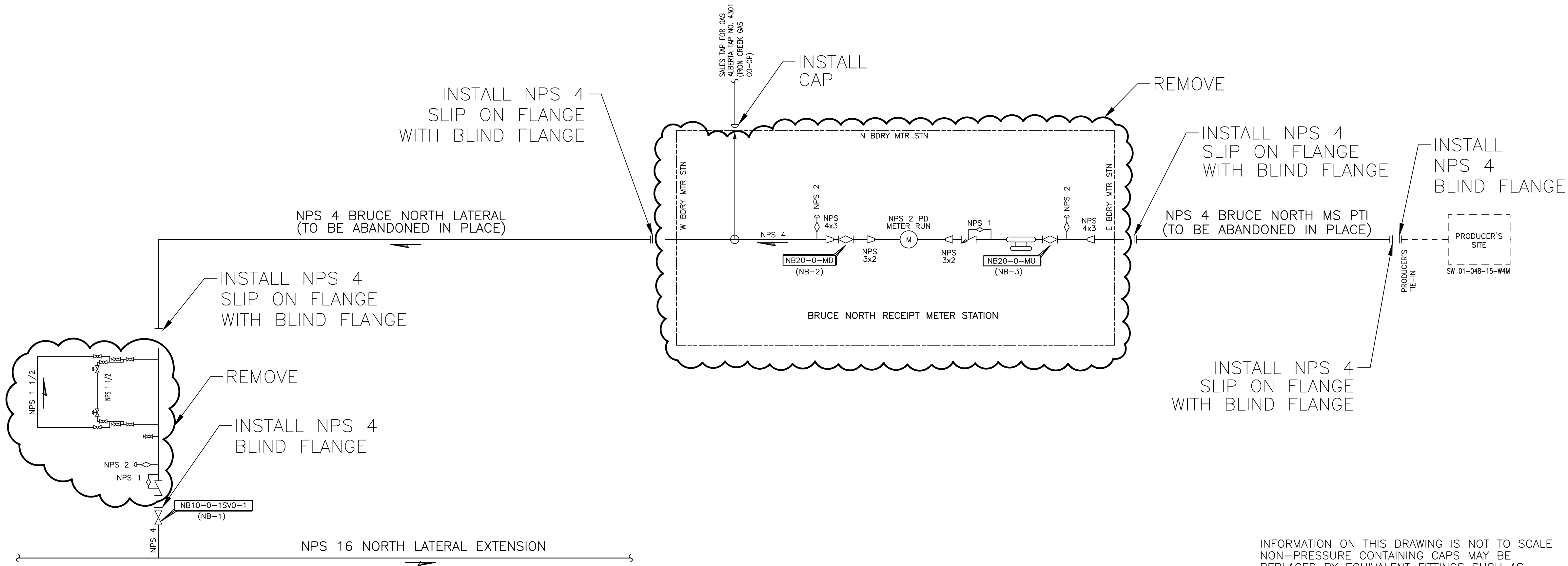
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NPS 12 BIGSTONE LATERAL



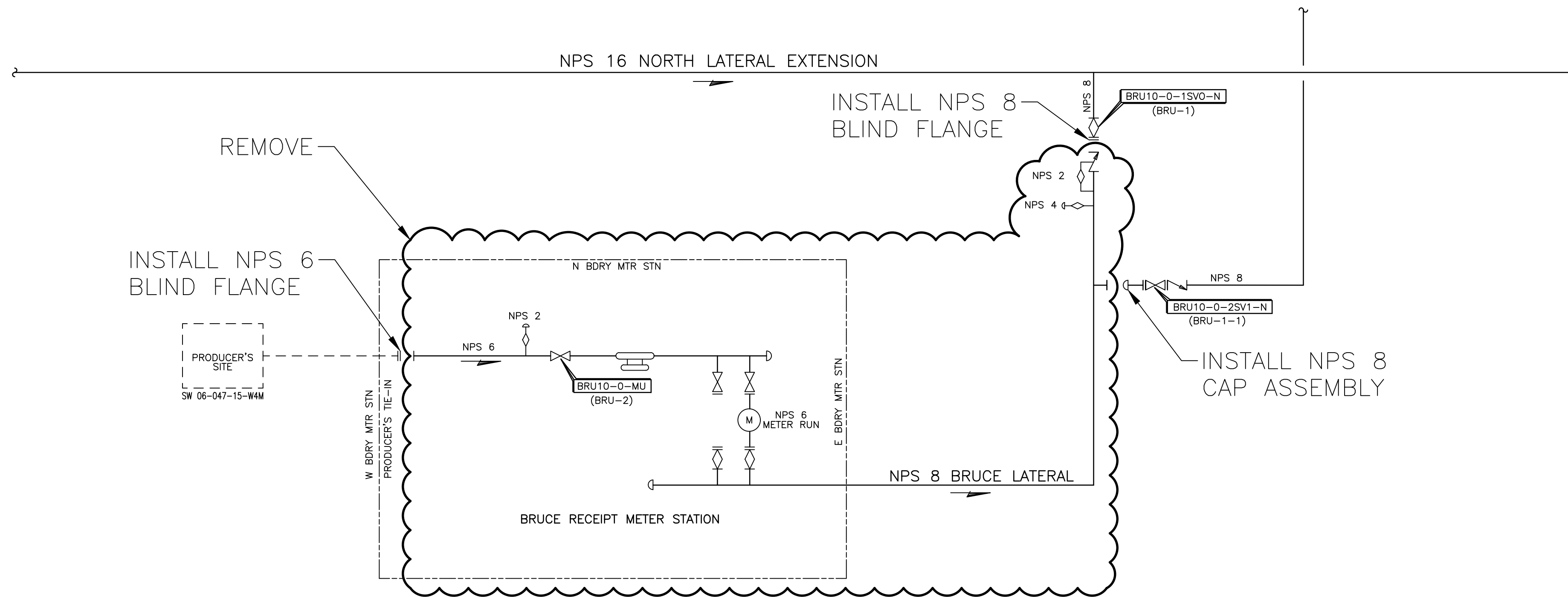
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BRUCE NORTH RECEIPT METER STATION, NPS 4 BRUCE NORTH LATERAL, AND NPS 4 BRUCE NORTH MS PTI



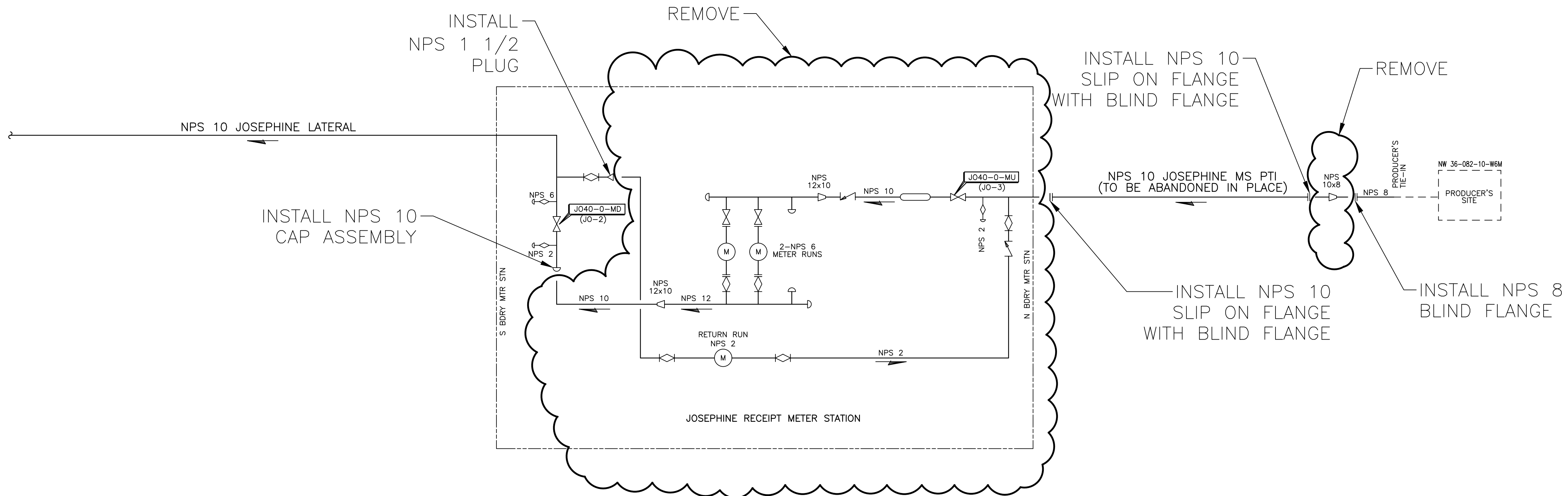
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BRUCE RECEIPT METER STATION AND NPS 8 BRUCE LATERAL



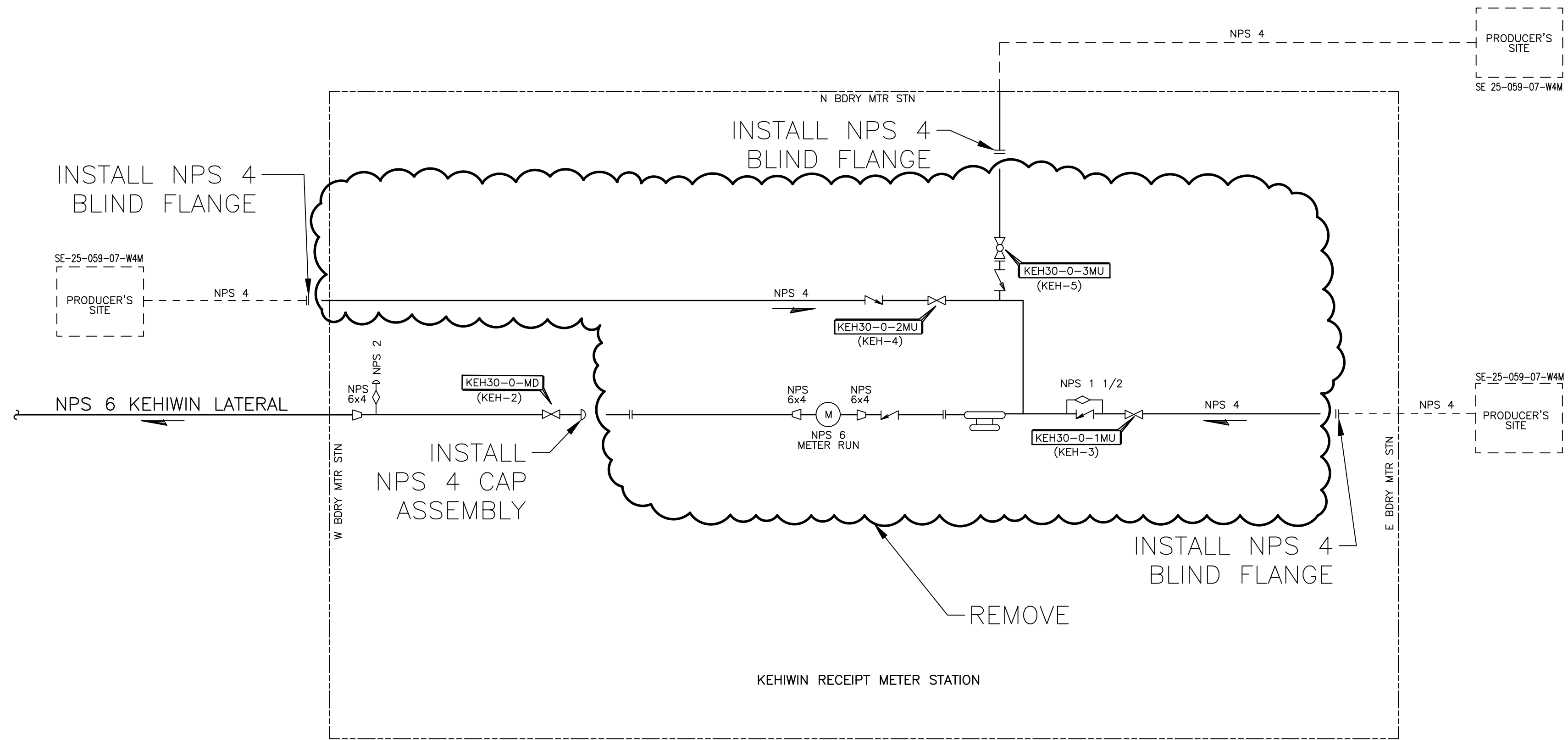
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JOSEPHINE RECEIPT METER STATION AND NPS 10 JOSEPHINE MS PTI



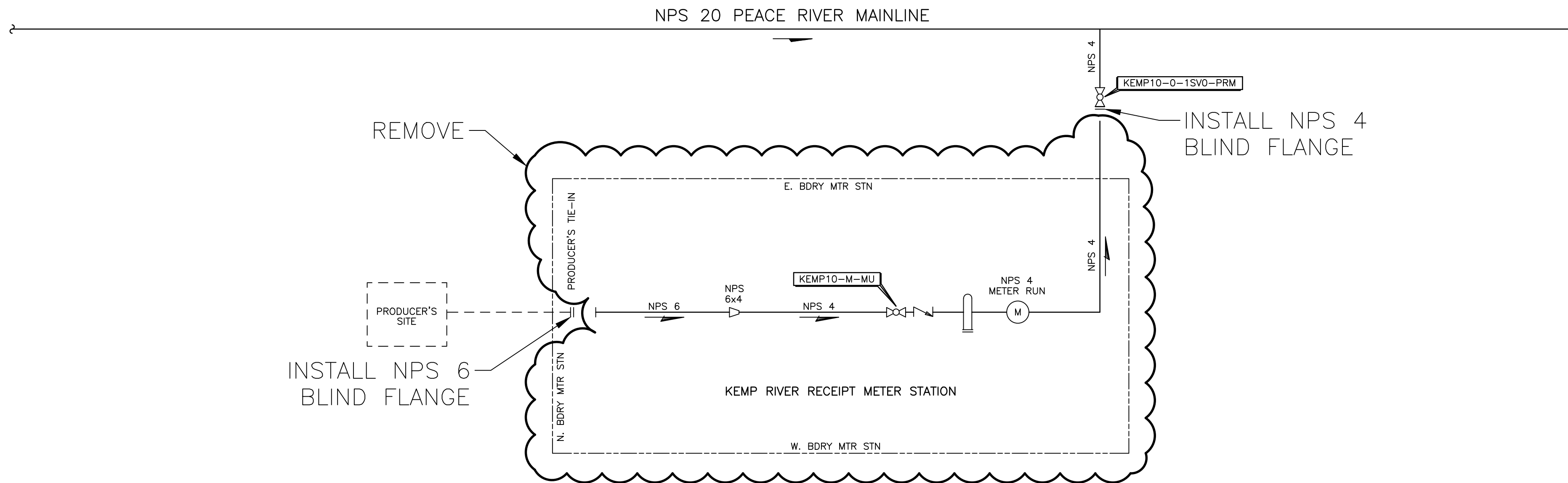
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KEHIWIN RECEIPT METER STATION



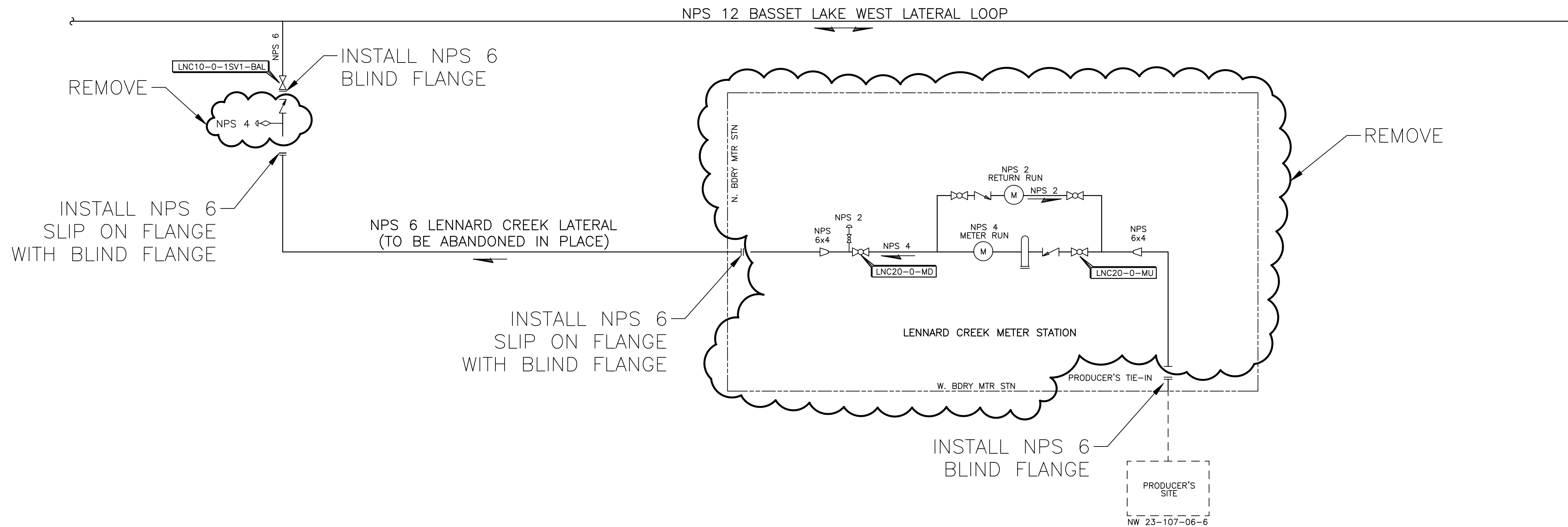
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KEMP RIVER RECEIPT METER STATION



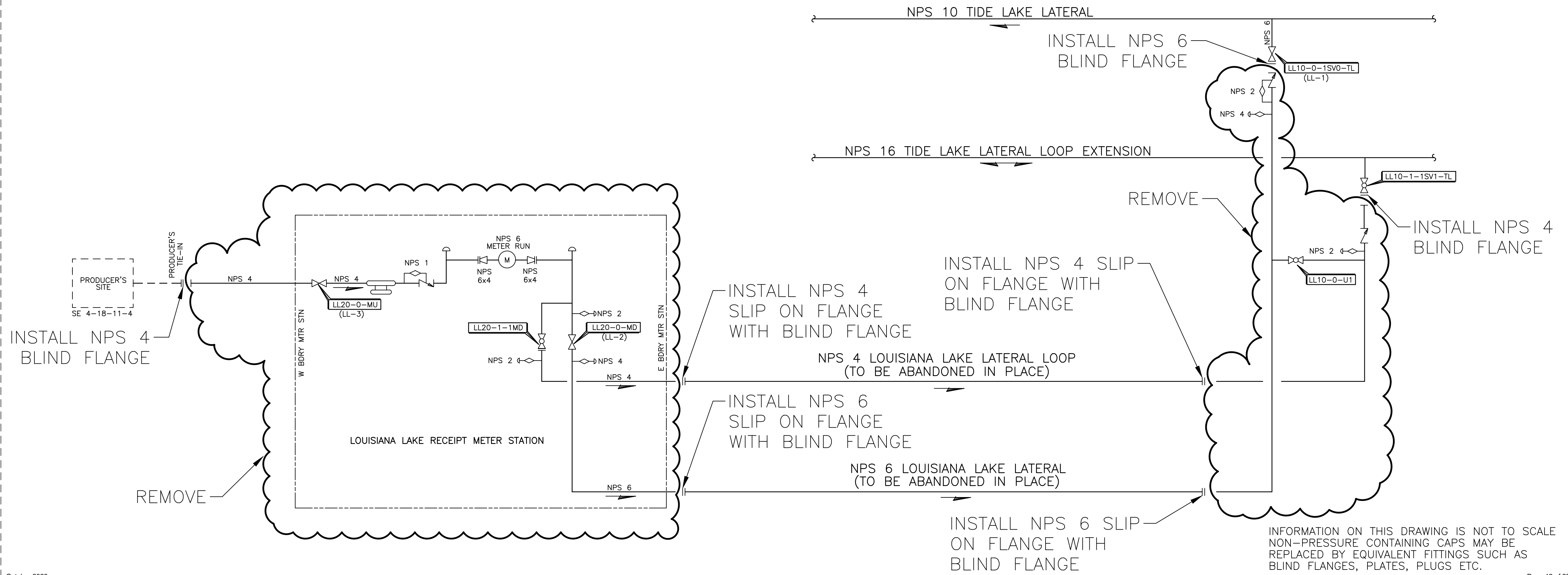
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LENNARD CREEK RECEIPT METER STATION AND NPS 6 LENNARD CREEK LATERAL



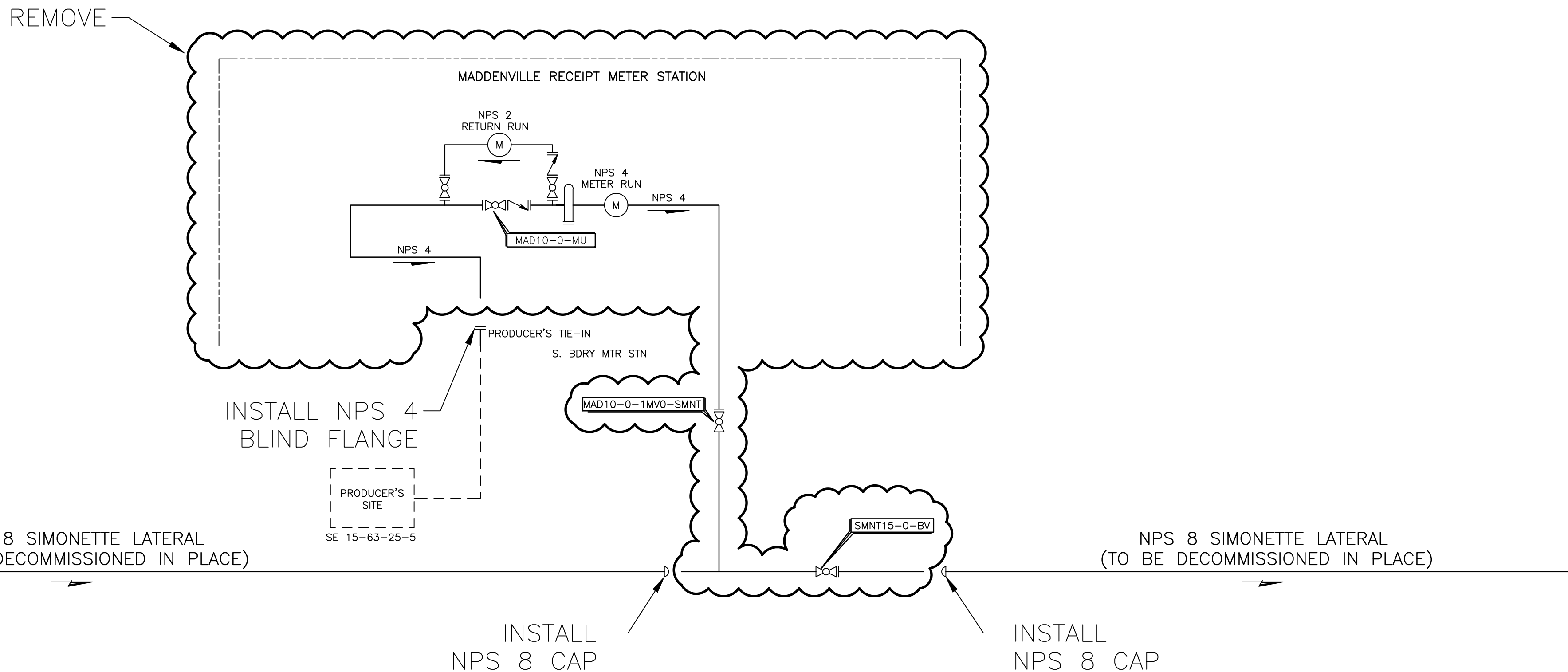
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BLIND FLANGES, PLATES, PLUGS ETC.

LOUISIANA LAKE RECEIPT METER STATION, NPS 6 LOUISIANA LAKE MS PTI, NPS 6 LOUISIANA LAKE LATERAL AND NPS 4 LOUISIANA LAKE LATERAL LOOP



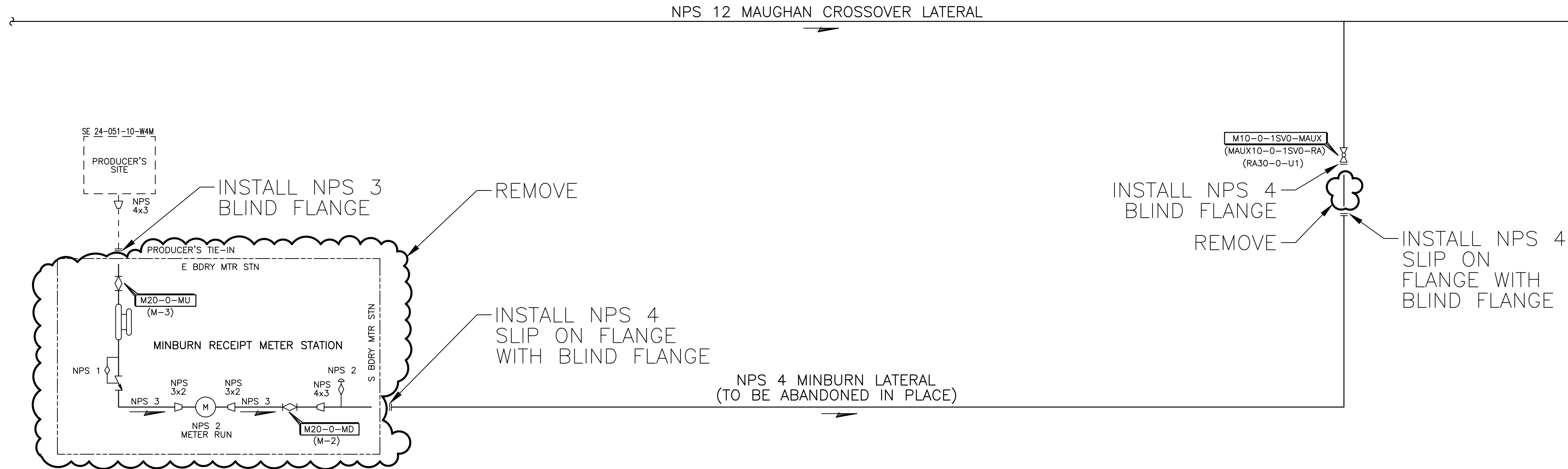
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MADDENVILLE RECEIPT METER STATION



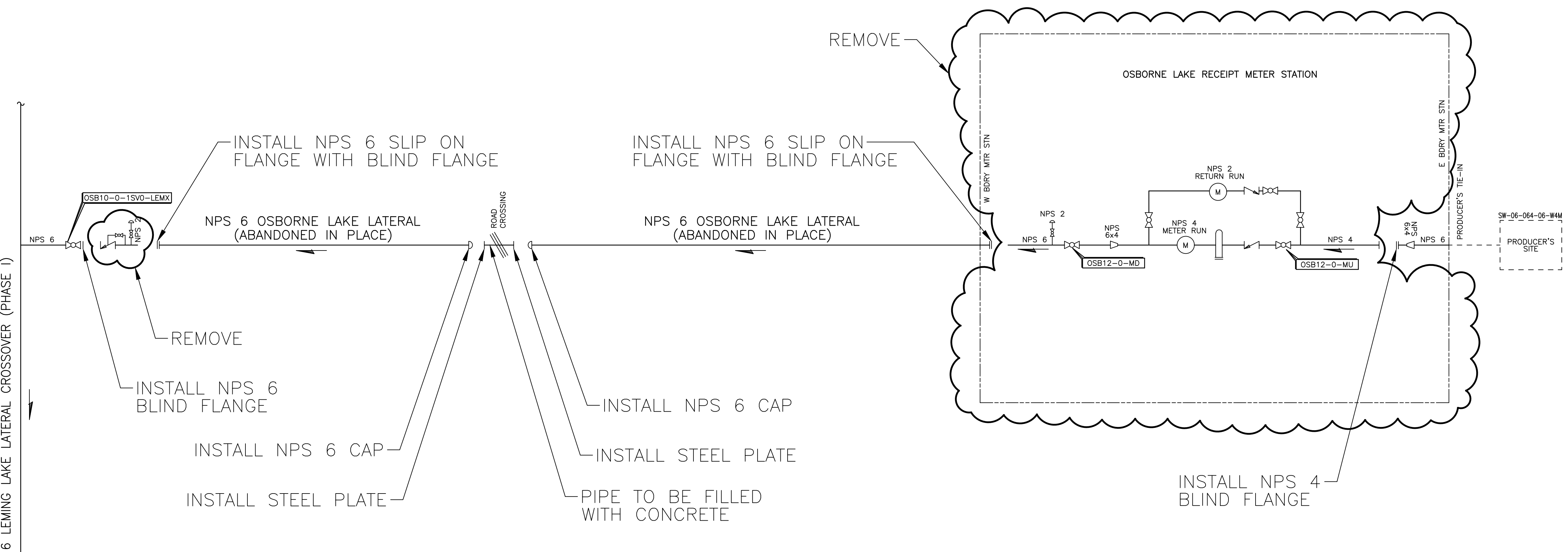
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MINBURN RECEIPT METER STATION AND NPS 4 MINBURN LATERAL



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OSBORNE LAKE RECEIPT METER STATION AND NPS 6 OSBORNE LAKE LATERAL

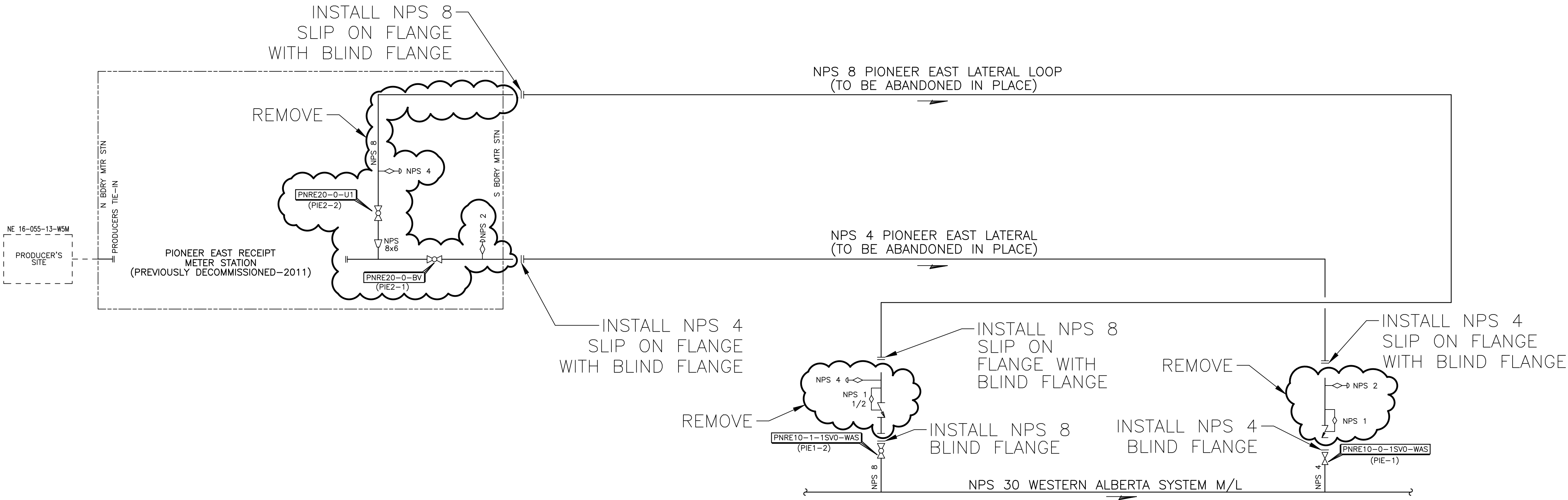


NPS 16 LEMING LAKE LATERAL CROSSOVER (PHASE I)

October 2023

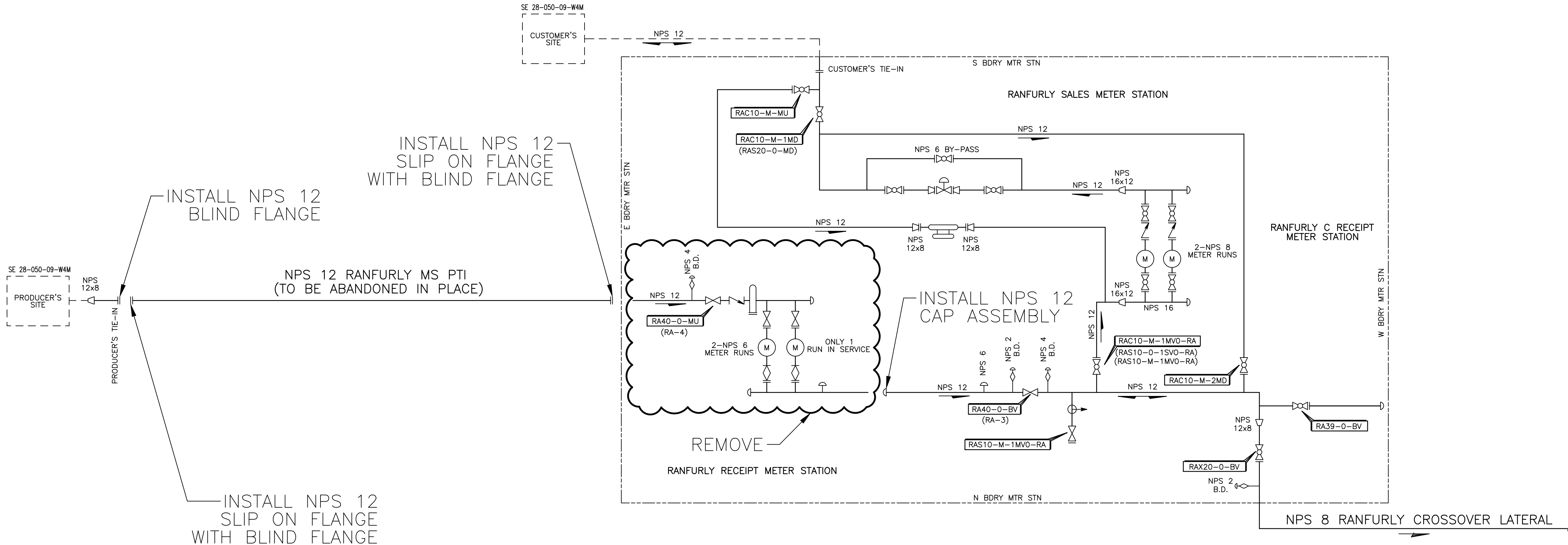
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PIONEER EAST RECEIPT METER STATION, NPS 4 PIONEER EAST LATERAL, AND NPS 8 PIONEER EAST LATERAL LOOP



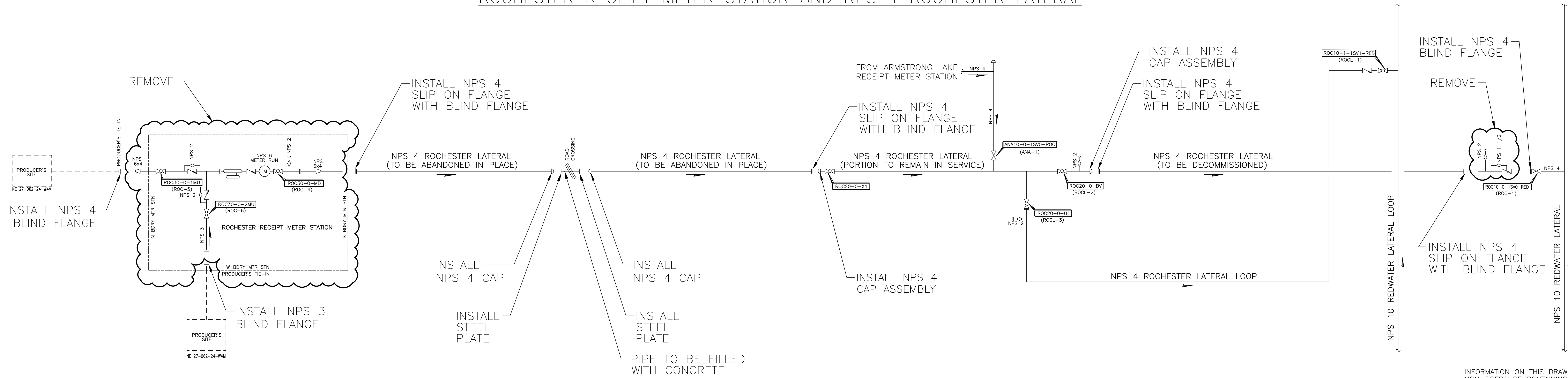
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RANFURLY RECEIPT METER STATION AND NPS 12 RANFURLY MS PTI



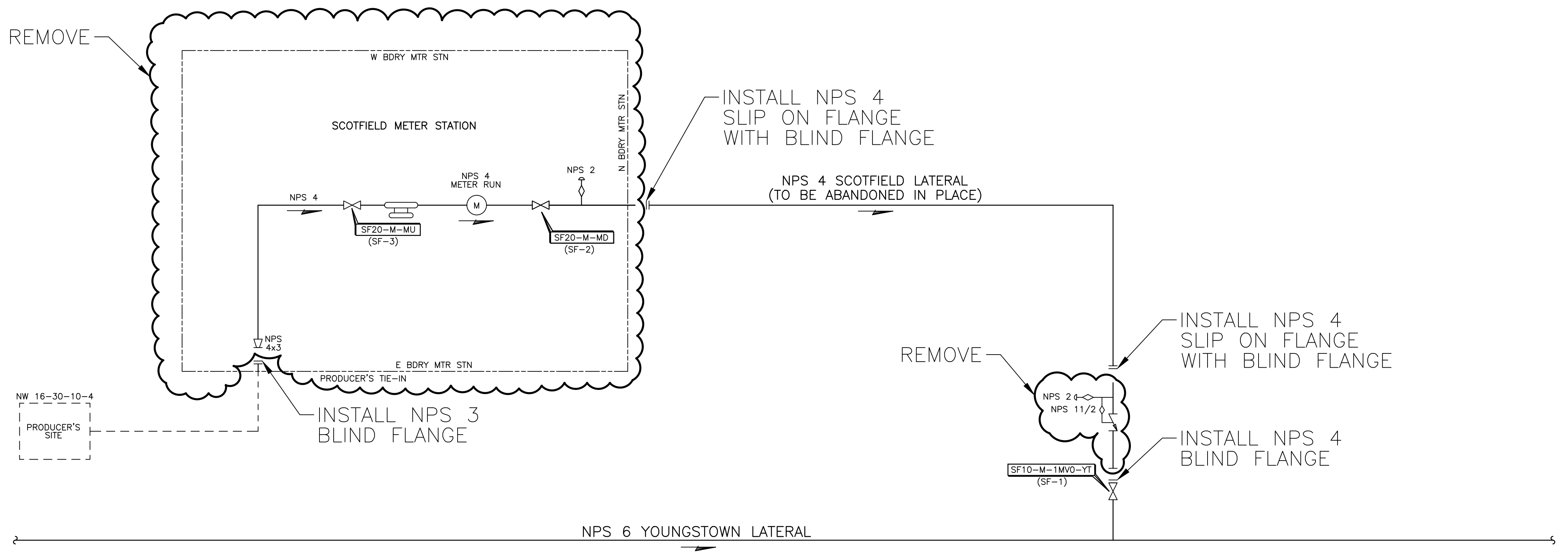
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ROCHESTER RECEIPT METER STATION AND NPS 4 ROCHESTER LATERAL



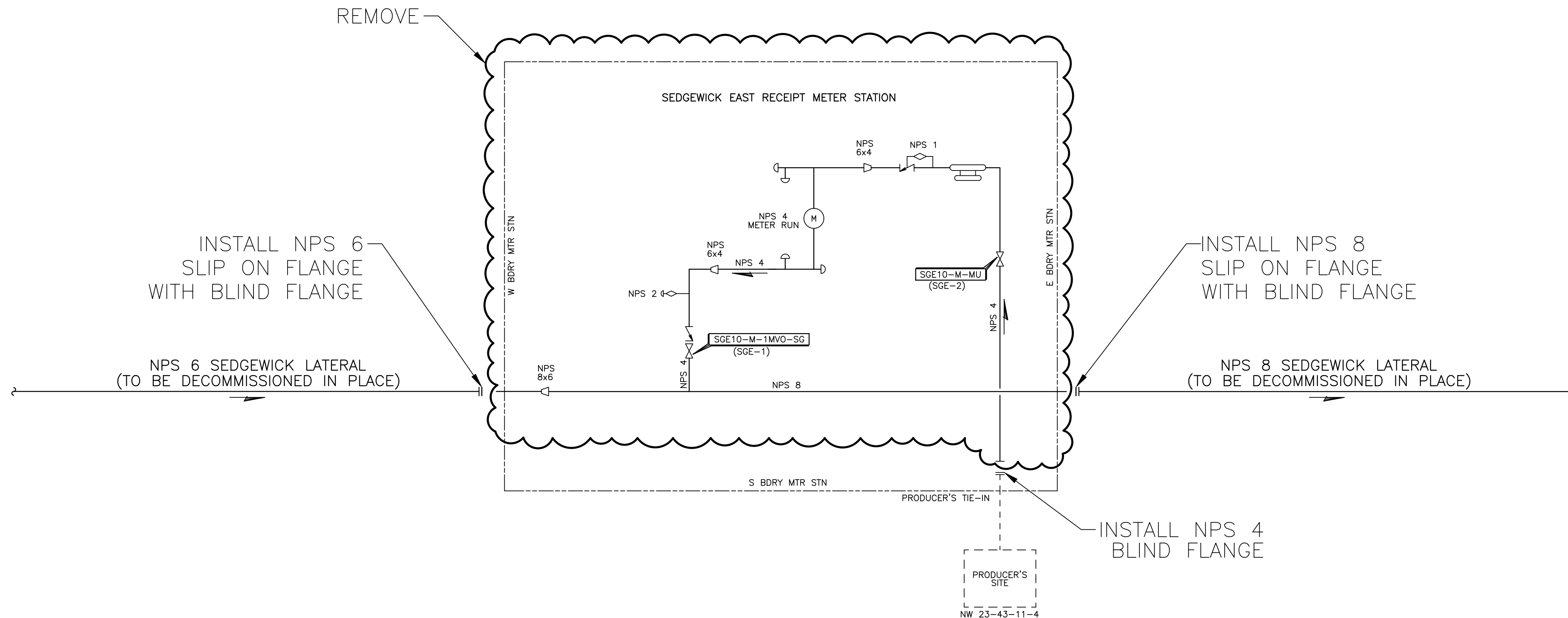
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SCOTFIELD RECEIPT METER STATION AND NPS 4 SCOTFIELD LATERAL



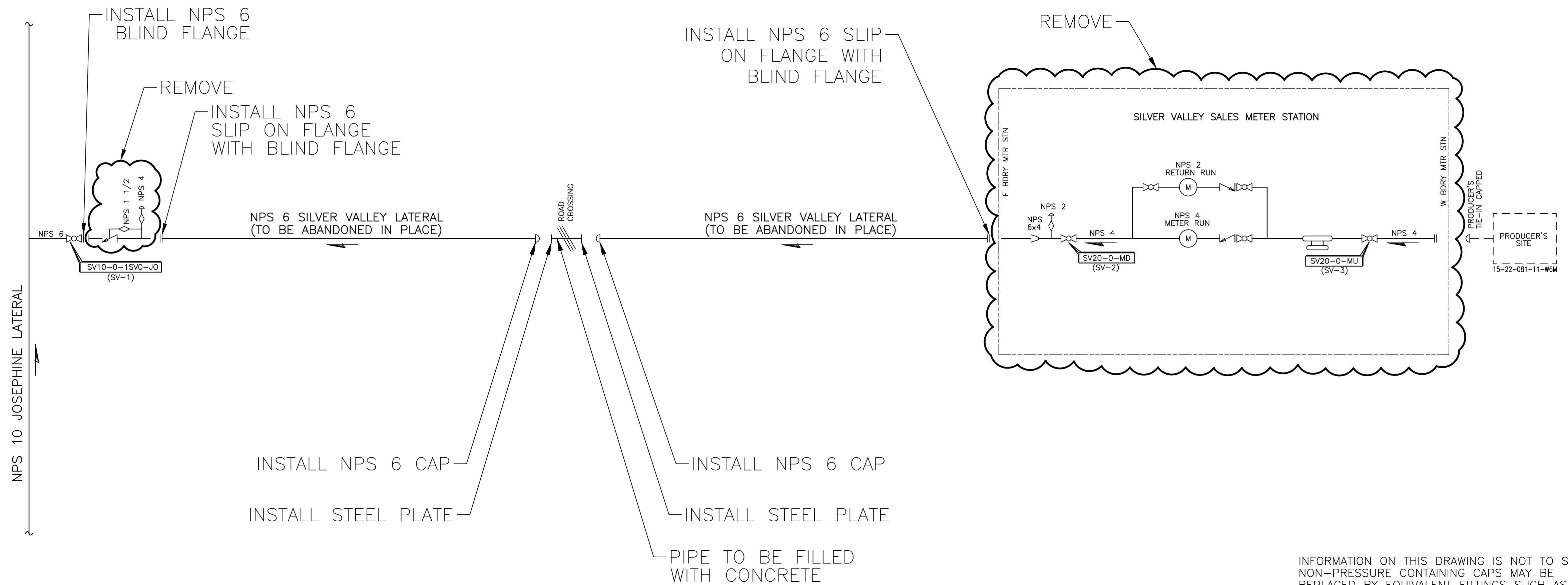
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SEDGEWICK EAST RECEIPT METER STATION



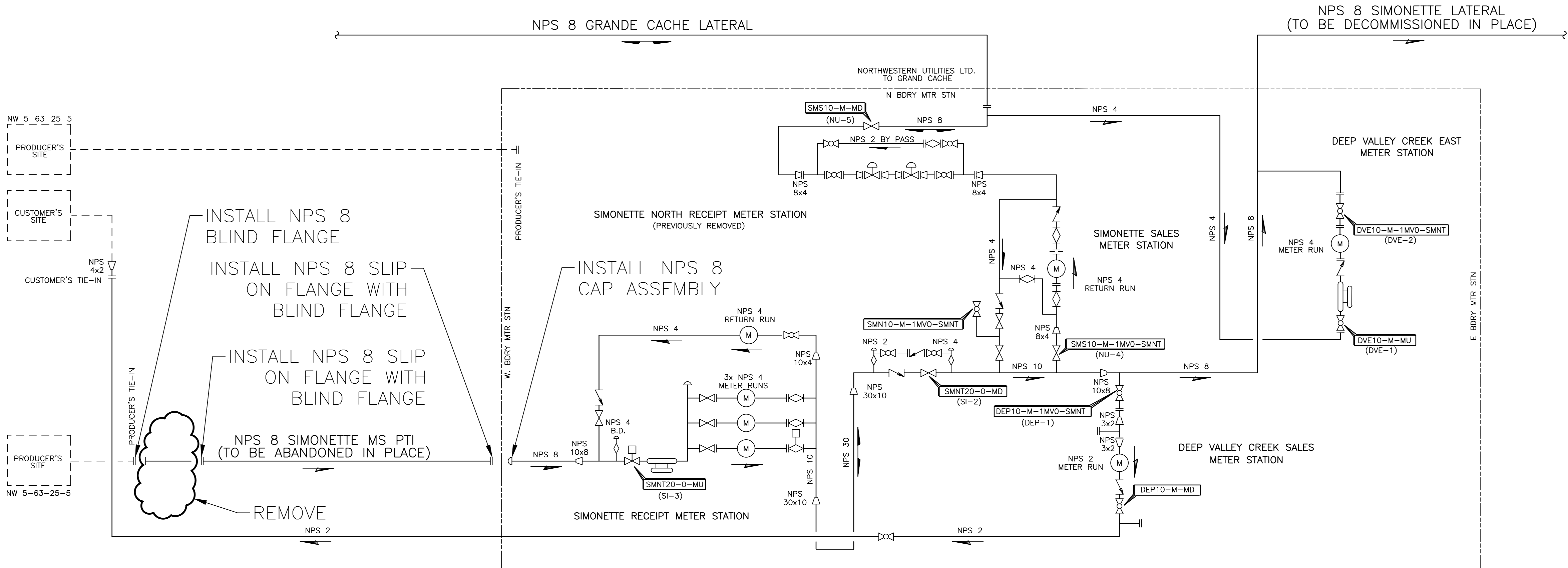
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SILVER VALLEY SALES METER STATION AND NPS 6 SILVER VALLEY LATERAL



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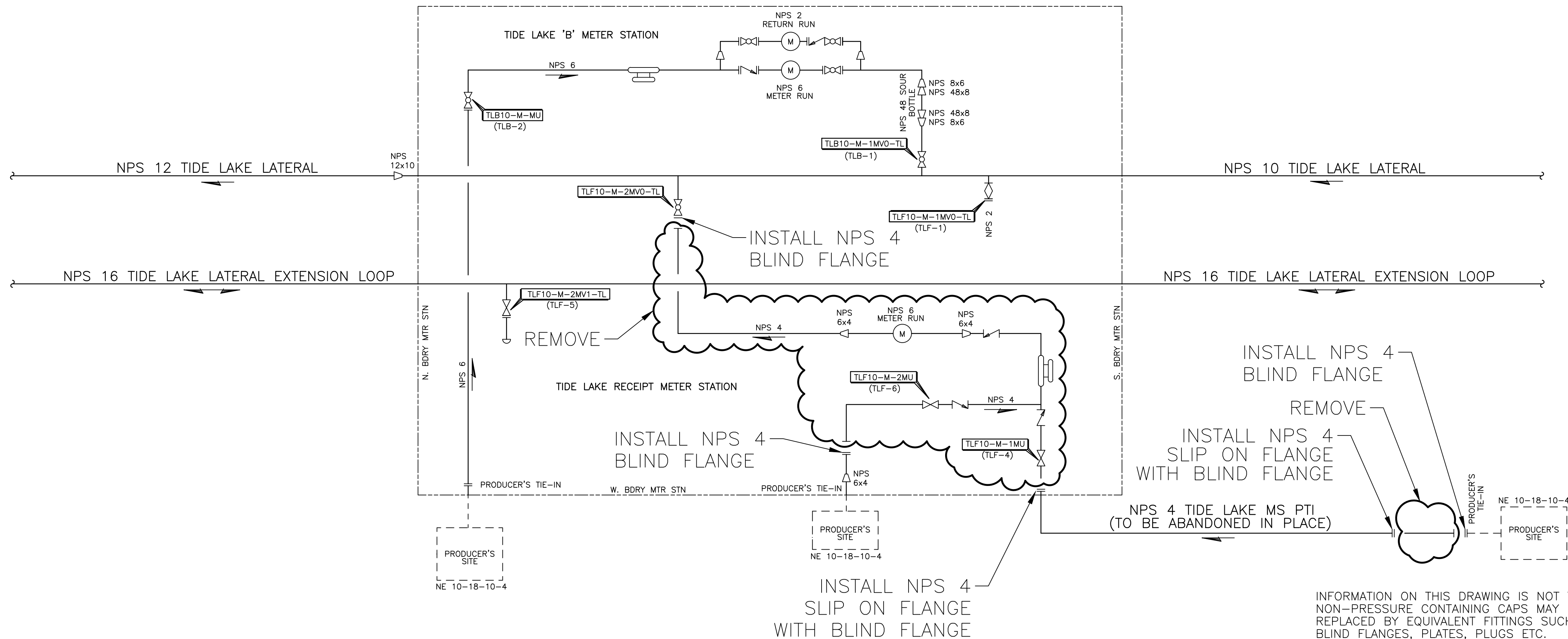
NPS 8 SIMONETTE PTI



INFORMATION ON THIS DRAWING IS NOT TO SCALE
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NPS 4 TIDE LAKE MS PTI

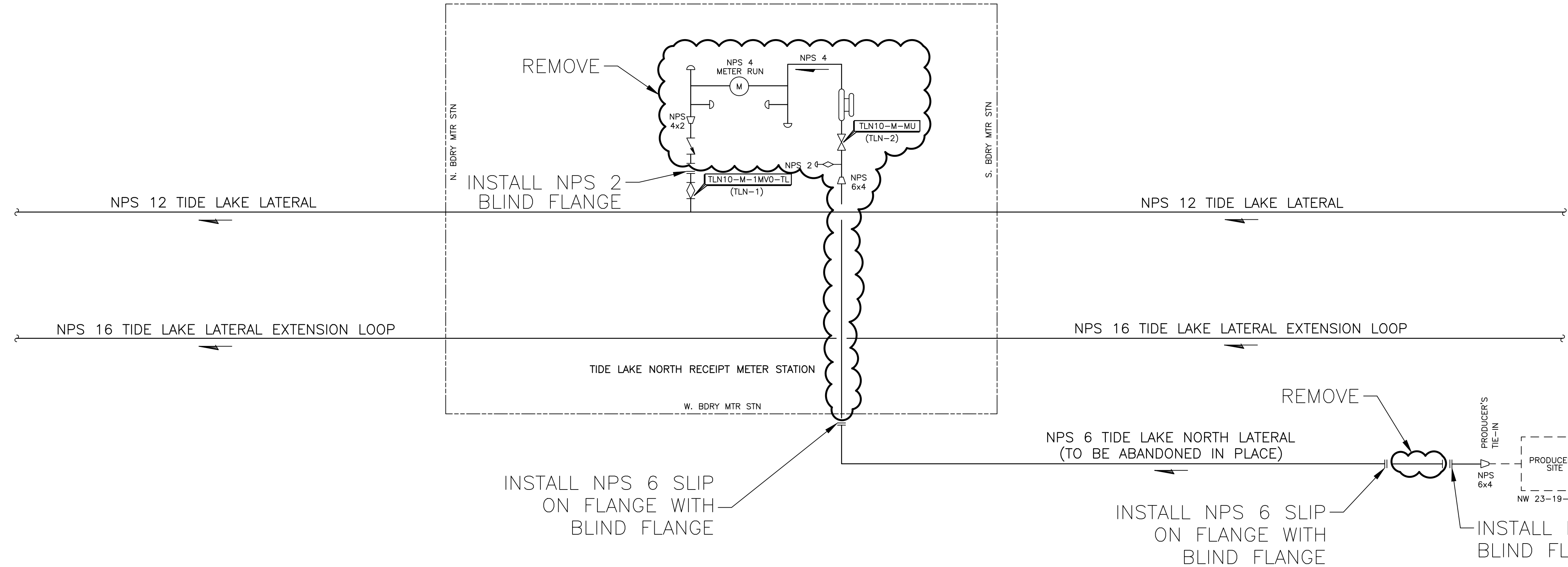
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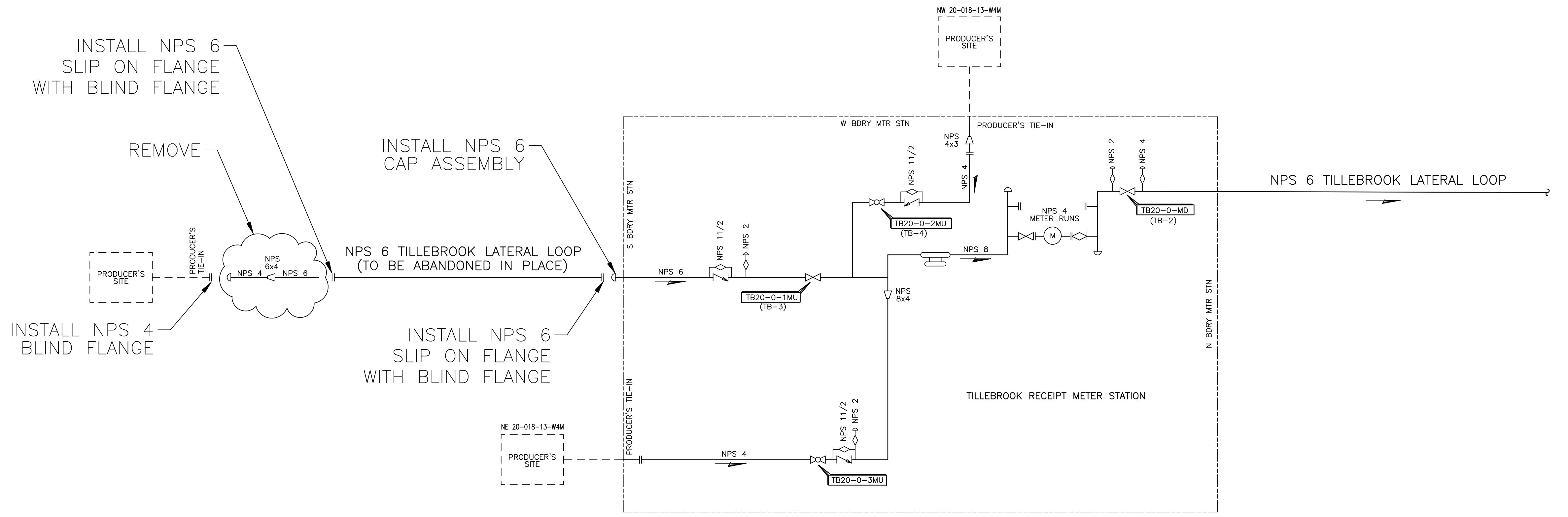
NPS 6 TIDE LAKE NORTH LATERAL

TIDE LAKE NORTH MS TO BE COMPLETED UNDER GEP SDO
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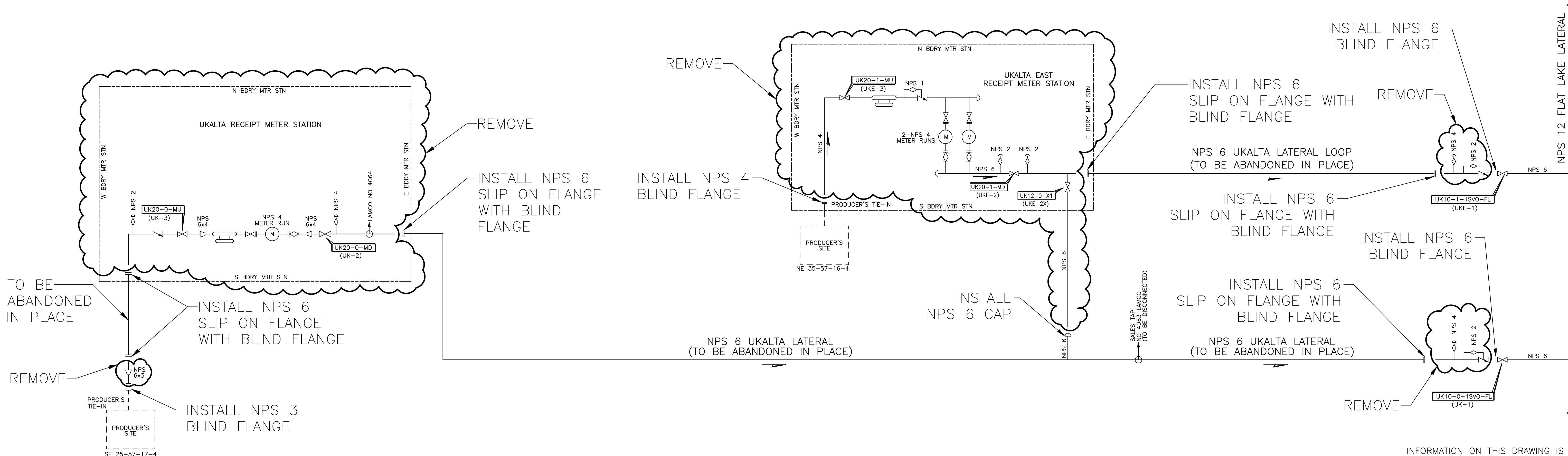
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NPS 6 TILLEBROOK MS PTI



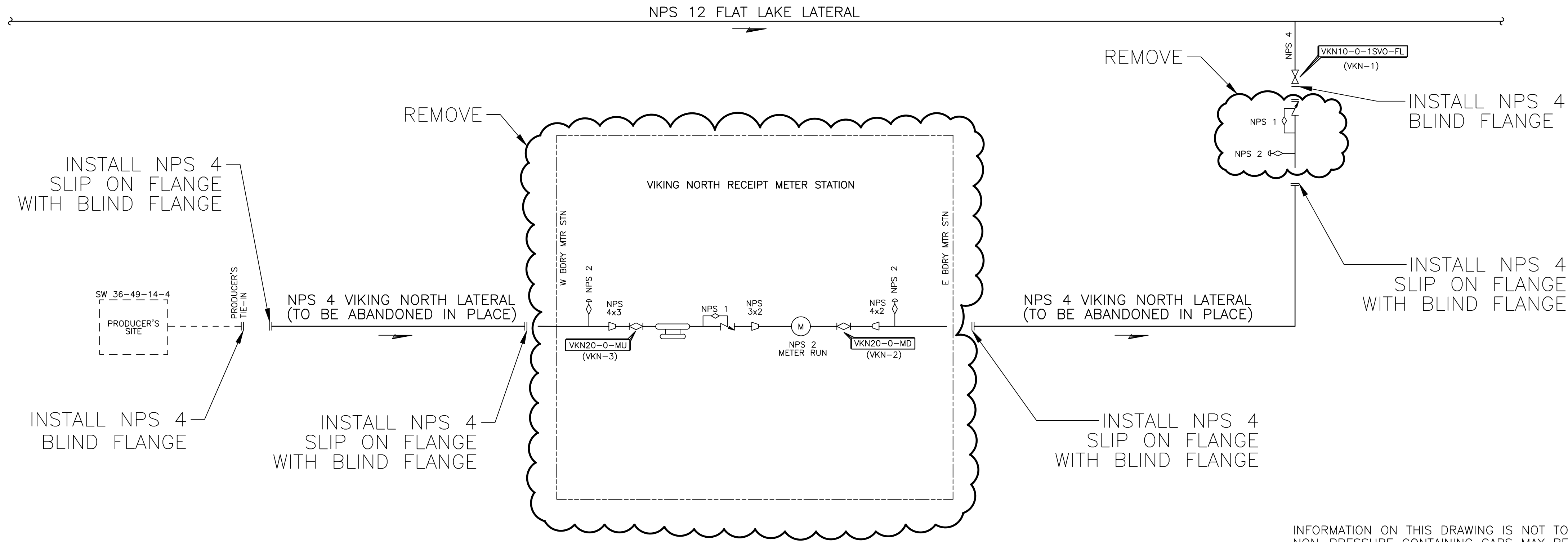
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UKALTA RECEIPT METER STATION, NPS 6 UKALTA LATERAL, UKALTA EAST RECEIPT METER STATION AND NPS 6 UKALTA LATERAL LOOP



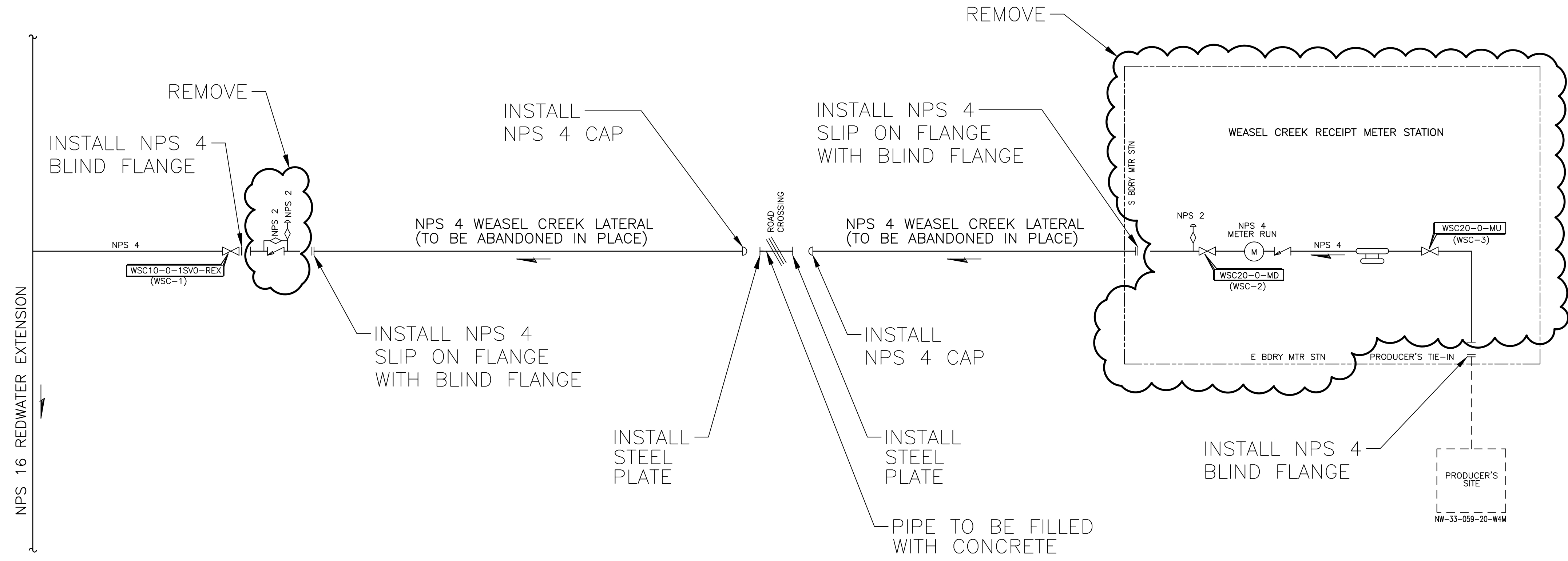
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VIKING NORTH RECEIPT METER STATION AND NPS 4 VIKING NORTH LATERAL



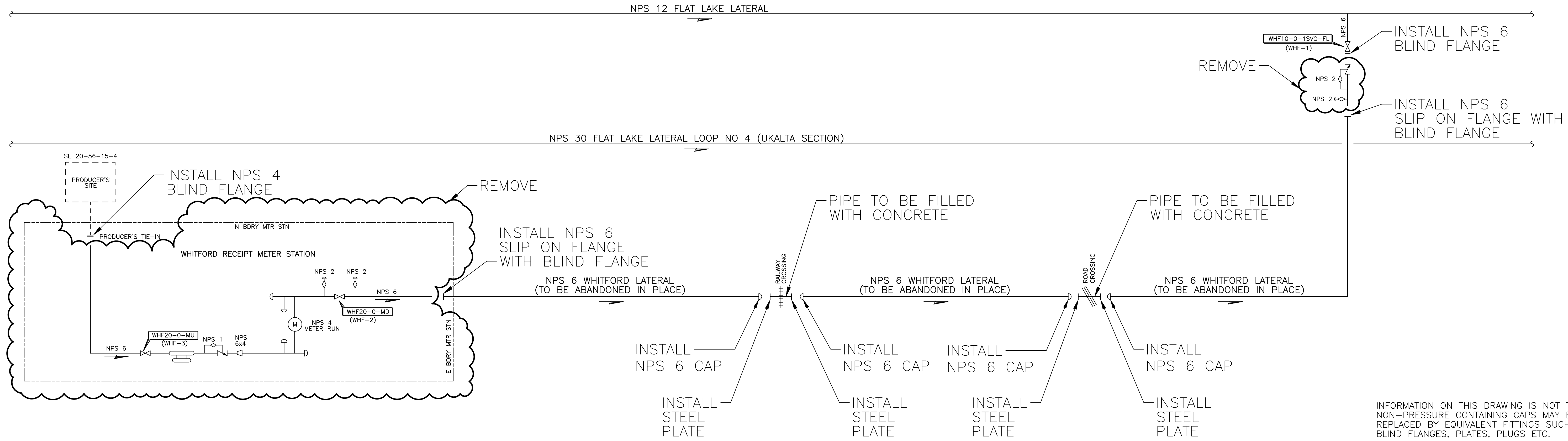
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WEASEL CREEK RECEIPT METER STATION AND NPS 4 WEASEL CREEK LATERAL



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REPLACED BY EQUIVALENT FITTINGS SUCH AS
BLIND FLANGES, PLATES, PLUGS ETC.

WHITFORD RECEIPT METER STATION AND NPS 6 WHITFORD LATERAL



Revised Attachment 7: Interactions Table

Interactions Table

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
Physical and Meteorological Environment	N	<ul style="list-style-type: none"> The Program will not affect the meteorological environment. The Program Components are not within areas of unstable terrain, or acid rock drainage. Potential effects from erosion are discussed in the Soil and Soil Productivity element of this table. Potential effects on climate resilience mitigation associated with extreme weather events are discussed in the Effects of the Environment on the Project element of this table. 	N/A	None	N	N/A	None	None	N/A
Soil and Soil Productivity	Y	<ul style="list-style-type: none"> Physical abandonment activities¹ such as above-ground facility removal, pipeline removal, isolation of below-ground infrastructure, removal of cathodic protection site, and cutting, filling and capping at highway and railway crossings will occur largely within existing, previously disturbed ROWs and facility sites. Physical abandonment activities include ground disturbance in 115 PDAs. The PDAs are largely within existing facility site boundaries and/or existing ROWs; however, TWS outside of ROW/facility boundaries may be required. PDAs range in area from 0.08 ha to 1.00 ha. The total area of all PDAs is up to 20.01 ha. 153.45 km of lateral pipelines will be abandoned in-place over 23 pipeline selections, 0.51 km of lateral pipelines will be removed. Generally, surficial layers (topsoil/strippings) were stripped from meter station areas, which have a graveled surface during operations. 52 Program components are located in areas that may have salinity or soil moisture limitations. 163 Program components involve physical abandonment activities in agricultural areas 	Complete	<p>Physical Abandonment Change in soil quality during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Loss or alteration (e.g., admixing) of topsoil/ strippings during soil handling. Compaction, rutting, admixing or loss of soil structure through vehicle and equipment movement. Soil loss through wind and water erosion. Loss of soil volume and changes in surface contours as a result of subsidence associated with pipeline removal. Introduction or spread of soil pathogens through vehicle and equipment movement. Remediation of pre-existing contamination. <p>Abandonment In-Place Change in soil quality and quantity during abandonment in-place due to:</p> <ul style="list-style-type: none"> Ground subsidence resulting from pipeline corrosion and collapse resulting in water conduits, and potential contaminants transfer. 	Y	<p>Physical Abandonment Soil Handling</p> <ul style="list-style-type: none"> To assist in maintaining an intact ground surface in areas where grading is not necessary, implement minimum surface disturbance techniques such as mulching, brushcutters, brushhogs or other equipment. Non-merchantable timber shall be mulched or skidded to the closest burn pile location. Conduct topsoil salvage on all arable or potentially arable lands to promote successful reclamation and ensure this resource is returned to an equivalent land capability. On agricultural lands, topsoil handling procedures may be modified based on the need to meet the objective of protecting the soil resources, as directed by the Environmental Inspector(s) or designate(s). Soil storage areas will be approved by the Environmental Inspector(s) or designate(s). Salvage topsoil/strippings as indicated on the Environmental Alignment Sheets, Environmental 	<p>Physical Abandonment <u>Change in soil quality may occur:</u></p> <ul style="list-style-type: none"> Soil loss or alteration may occur during physical abandonment activities as a result of soil handling, compaction, rutting, loss of soil structure, wind and water erosion, the introduction of soil pathogens, and contamination. <p><u>Change in terrain may occur:</u></p> <ul style="list-style-type: none"> Alteration of terrain may occur as a result of surface contour changes as a result of loss of soil volume or subsidence. <p>Given the application of the proposed mitigation measures including the related management, contingency and monitoring plans, the residual effects of the Program on soil quality are predicted to be neutral in direction (with the</p>	<p>While there are historical and ongoing regional changes in soil and soil productivity, the Program's contribution to these trends is expected to be short-term and reversed following reclamation. It is predicted that any residual adverse effects will be reversed following the Program's completion and, through reclamation. Because of this predicted outcome, residual adverse cumulative effects on soils as a result of the Program are considered to be negligible.</p> <p>Significance Cumulative effects are not expected to result in a permanent adverse change in soil quality, such that existing land uses cannot continue at or close to the current level; therefore,</p>	<p>Environmental inspection will occur during physical abandonment activities.</p> <p>Post-abandonment monitoring will follow Program's Abandoned Pipeline Monitoring Plan and Reclamation Monitoring Plan.</p>

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
		<p>in a county or municipality with documented clubroot occurrences.</p> <ul style="list-style-type: none"> Phase I Environmental Site Assessments were completed for the Program. Facility PDAs were identified as having APECs. The Phase I ESAs identified areas of potential environmental concern (APECs) at 16 locations. <p>Interactions</p> <p>Interactions with soil productivity may occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> soil stripping and grading excavation/trenching vehicle and equipment movement wind and water erosion vegetation removal remediation of pre-existing contamination <p>Interactions with soil capability may occur during abandonment in-place due to:</p> <ul style="list-style-type: none"> subsidence from Pipeline Corrosion and Collapse. 				<p>Figures and/or other Project-specific environmental documents and in accordance with the typical drawings.</p> <ul style="list-style-type: none"> If wet/thawed soil conditions occur, implement the <i>Wet Soil Contingency Plan</i> (Appendix 1E of the EPP). Undertake all grading with the understanding that original contours and drainage patterns will be re-established during clean-up unless otherwise authorized by the Environmental Inspector(s) or designate(s) or identified on Project-specific drawings. Do not use topsoil/strippings as backfill under any circumstances. In agricultural areas, avoid scalping the sod layer in pasture and hay land during backfill. Place spoil back into the excavation/trench in such a way as to prevent loss or mixing of topsoil/strippings. Do not mix snow with spoil material during backfill. To reduce the potential for subsidence, roach all available spoil over the excavation/trench to allow for settlement. If necessary, rework spoil material to break-up frozen clumps prior to backfilling. Return all excavated material back into the excavation/trench. Replace topsoil/strippings to a uniform depth, on all portions of the Project footprint that were stripped. Match topsoil/strippings depth to the unstripped edges of the Project footprint. On freehold or designated crown agricultural lands, if abandonment activities occur 	<p>exception of remediation of pre-existing contamination which is predicted to be beneficial in direction), low in magnitude, localized to the PDA, short-term in duration and reversible over time.</p> <p>Abandonment In-Place</p> <p>Given that the diameter of the pipelines to be abandoned in place by the Program range from 8 NPS (~219 mm) to 12 NPS (~324 mm), ground subsidence is anticipated to be negligible. In addition to the diameter of the pipes, the localized nature of the potential subsidence events and the time scale for corrosion and eventual subsidence means that measurable effects on soil capability or productivity as a result of ground subsidence is unlikely.</p> <p>Significance</p> <p>With the application of the mitigation measures outlined in the EPP, residual effects are not expected to adversely change soil quality such that existing land uses cannot continue at or close to the current level; therefore, residual adverse effects on soil and soil productivity are predicted to be not significant.</p>	<p>cumulative effects on soil productivity are predicted to be not significant.</p>	

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						<p>under frozen ground conditions, delay topsoil/strippings replacement until the topsoil/strippings pile and excavation/trench spoil has completely thawed. Postpone replacement of topsoil/strippings during wet weather or high winds to prevent erosion and/or damage to the soil structure.</p> <ul style="list-style-type: none"> Implement the <i>Soil Handling Contingency Plan</i> (Appendix 1E of the EPP) if any of the following are encountered: little to no topsoil present; uneven boundary between topsoil and subsoil; uneven surface on pasture; request for alternate soil handling methods by a landowner; or soil pulverization and high winds. The Contractor will use berms, cross ditches, sediment fencing and/or other appropriate measures to prevent erosion and siltation into adjacent wetland areas, unless otherwise directed by the Company. Refer to the <i>Soil Erosion Contingency Plan</i> (Appendix 1E of the EPP) for additional measures. <p><u>Compaction, Rutting, Loss of Soil Structure</u></p> <ul style="list-style-type: none"> If ground conditions are encountered that create potential for rutting, admixing or compaction, then minimize ground disturbance by using a protective layer such as frost packing, snow, ice, geotextile and fill, rig mats, swamp mats, or access mats between the wetland's root/seed bed and construction equipment. In the event of adverse weather that could result in rutting, sedimentation and erosion, 			

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						<p>and/or compaction, the Environmental Inspector(s) or designate(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the <i>Adverse Weather Contingency Plan</i> (Appendix 1E of the EPP). A soils specialist and/or the responsible regulatory agency may be consulted, if warranted.</p> <ul style="list-style-type: none"> • Following an adverse weather event, confirm the efficacy of sediment and erosion control measures and whether corrective action is required. Environmental Inspector(s) or designate(s) will determine the locations where subsoil compaction is an issue. Prior to topsoil/strippings replacement, rip compacted subsoils on the Project footprint with a multi-shank ripper or breaking disc to a depth of compaction. If soils are moist, postpone ripping of subsoils until soils dry to ensure that the soils fracture when ripped. • In areas where the topsoil is in place, use special equipment such as a paratiller to relieve compaction with reduced potential for admixing at the discretion of the Environmental Inspector(s) or designate(s) in consultation with the Construction Manager. • Where excavation/trenching has been conducted under frozen ground conditions, delay final excavation/trench compaction until the subsoil has completely thawed. Re-grade areas with vehicle ruts or erosion gullies. 			

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						<p><u>Wind and Water Erosion</u></p> <ul style="list-style-type: none"> Should Project traffic or other related Project activity disturb the topsoil/strippings piles and there is a potential for wind erosion, apply additional water and/or tackifier, if warranted. Should high winds or heavy rains damage the tackifier during abandonment activities, contingency measures outlined in the <i>Adverse Weather Contingency Plan</i> (Appendix 1E of the EPP) will be implemented. <p><u>Surface Contour Changes</u></p> <ul style="list-style-type: none"> Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. To reduce the potential for surface subsidence, roach all available spoil over the trench to allow for settlement. If necessary, rework spoil material to break-up frozen clumps prior to backfilling the trench. Where native grassland is identified, site specific mitigation and reclamation measures will be implemented that are consistent with practices outlined in <i>Recovery Strategies for Industrial Development in Native Prairie in the Mixedgrass Natural Subregion of Alberta</i> (Neville et al. 2014) and the <i>Dry Mixedgrass Natural Subregion of Alberta</i> (Gramineae Services Ltd. 2013), as applicable. Specifically: Prior to the initiation of physical abandonment activities, NGTL will clearly identify the start/end 			

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						<p>KPs for native grassland intersecting the PDA, including access.</p> <ul style="list-style-type: none"> In areas of native grassland, use ground protection materials (e.g., mats) for short-term traffic access in native grassland. The timeframe between topsoil stripping and replacement will be reduced. Topsoil stripping and replacement will occur when native vegetation is dormant within the same year and before the next growing season, where feasible. In native prairie, topsoil removal from the sod layer will be done in such a manner to minimize scalping. Prairie Protectors and/or sweepers or equivalent will be used to minimize disturbance to the sod layer. The Contractor shall ensure that efforts are made to minimize grading to the extent possible. <p><u>Soil Pathogens</u></p> <ul style="list-style-type: none"> All equipment, including mats, must be clean and free of soil or vegetative debris prior to use on site. Equipment will be inspected by the Environmental Inspector(s) or designate(s), and if deemed to be in appropriate condition will be approved for use and identified with a suitable marker or tag. Any equipment, including mats, which do not arrive in appropriate condition shall not be allowed to perform any work until it has been cleaned, re-inspected by the Environmental Inspector(s) or designate(s), and deemed suitable for use. To minimize the potential for transporting clubroot to the 			

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						<p>Project footprint, following thorough cleaning to remove all soil and vegetative debris, all equipment including mats, shall be sanitized by misting with a weak disinfectant solution (i.e., 1-2% bleach), prior to conducting work on the Project, unless otherwise directed by the Environmental Inspector(s) or designate(s).</p> <p><u>Remediation of Pre-Existing Contamination</u></p> <ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II ESA Plan, submitted as part of the Application In the event contaminated soils or other materials are encountered during Project activities, implement the <i>Contaminated Soil Contingency Plan</i> (Appendix 1E of the EPP) and the <i>Chemical and Waste Management Plan</i> (Appendix 1F of the EPP). <p>Abandonment In-Place</p> <p><u>Subsidence</u></p> <ul style="list-style-type: none"> If issues associated with the abandoned pipelines are identified in the future, NGTL will work with stakeholders and the CER, as needed, to appropriately respond to those issues. Maintaining documentation on where the pipelines are abandoned in-place and communicating this information to landowners, lessees and regional authorities (e.g., municipalities) will reduce potential for effects on 			

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						other land users, particularly in relation to depth of cover or exposure concerns.			
Vegetation and Wetlands	Y	<ul style="list-style-type: none"> Physical abandonment activities include ground disturbance in 115 PDAs. The PDAs are largely within existing facility site boundaries and/or existing ROWs; however, TWS outside of ROW/facility boundaries may be required. The total area of all PDAs is 20.01 ha, including approximately 2.96 ha of potential native grassland vegetation, 0.16 ha of shrubland, 0.31 ha of broadleaf forest, 0.04 ha of coniferous forest and 0.08 ha of mixedwood forest. 153.45 km of lateral pipelines will be abandoned over 23 lateral pipeline selections, 0.51 km of lateral pipeline will be removed. Much of the vegetation within the lateral ROWs is previously disturbed and is generally assumed to be regenerating. One listed plant species of conservation concern, dwarf woollyheads (<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i>) ranked S2 by ACIMS was identified within two PDAs. One threatened plant species at risk, Slender Mouse-Ear Cress (<i>Halimolobos virgata</i>) ranked S2 by ACIMS and listed as Threatened (COSEWIC) occurs within the PDAs of twelve sites. Plant species of traditional importance may occur in the PDAs and LSAs. Weed species may occur in the PDAs and LSAs. Up to 1.21 ha of wetland within PDAs may be disturbed during physical abandonment activities, including marsh and swamp. <p>Interactions Interactions with vegetation and wetlands may occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> vegetation removal soil stripping and grading excavation/trenching 	Complete	<p>Physical Abandonment Change in abundance and/or distribution of vegetation communities and species during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Direct loss or alteration of vegetation communities and species resulting from vegetation removal and ground disturbance. Direct loss of plant species of conservation concern and species at risk arising from vegetation removal and ground disturbance. Change in invasive plant species density and distribution during physical abandonment activities due to: <ul style="list-style-type: none"> Introduction or spread of noxious and prohibited noxious species through vehicle and equipment movement. <p>Change in abundance, distribution or function of wetlands during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Loss or alteration of wetland area or wetland class arising from vegetation clearing and ground disturbance 	Y	<p>Physical Abandonment <u>Vegetation Removal</u></p> <ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. If previously unidentified rare plants or rare ecological communities are found on the Project footprint prior to or during abandonment activities, implement the <i>Plant Species and Ecological Communities of Concern Discovery Contingency Plan</i> (Appendix 1E of the EPP). Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of abandonment activities to ensure there is full understanding of the procedures involved. Clearly mark identified rare plant locations prior to the start of abandonment activities. To assist in maintaining an intact ground surface in areas where grading is not necessary, implement minimum surface disturbance techniques such as mulching, brushcutters, brushhogs or other equipment. Non-merchantable timber shall be mulched or skidded to the closest burn pile location. Where stripping and grading is not required during frozen ground conditions or in Crown non-agricultural land use, implement minimal surface disturbance techniques in accordance with the typical drawing (Appendix 1D of the EPP, Dwg. STDS-03-ML- 	<p>Change in abundance and/or distribution of vegetation communities and species may occur during physical abandonment activities:</p> <ul style="list-style-type: none"> Up to 2.96 ha of potential native grassland vegetation, 0.16 ha of shrubland, 0.31 ha of broadleaf forest, 0.04 ha of coniferous forest and 0.08 ha of mixedwood forest may be disturbed to complete physical abandonment activities. Approximately 26.37 ha of the PDAs includes disturbed areas (e.g., agriculture, industrial, roads). Mitigation measures have been developed to minimize disturbance to plant species at risk. Residual effects on vegetation will not result in a permanent change to the long-term viability of vegetation species or communities of management concern in the PDA such that existing land uses cannot continue at or close to the current level. In the longer term, the Program may have positive effects on native vegetation as a result of removal of above-ground infrastructure and reclamation of vegetation 	<p>Past and present projects and physical activities have influenced the baseline conditions for native, modified, and agricultural vegetation communities and species, and wetlands. Forestry, oil and gas, and agriculture are ongoing throughout the Program Component areas and are anticipated to continue. As well, new development of industrial, infrastructure, residential or commercial activities has the potential to occur in the future.</p> <p>The Program is expected to make a negligible contribution to ongoing cumulative effects on native vegetation or wetlands at the regional scale and may contribute positively through removal of above-ground infrastructure and reclamation of vegetation in these areas. A further assessment of cumulative effects on vegetation and wetland is not warranted on this basis.</p>	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.</p>

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		<ul style="list-style-type: none"> vehicle and equipment movement. <p>Interactions with vegetation and wetlands during abandonment in-place are excluded because no further vegetation removal or ground disturbance is required. Post-abandonment monitoring activities will be completed in accordance with the EPP and Abandonment Monitoring Plan.</p>				<p>05-445), and as indicated on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environment documents. If vegetation removal is required to access physical abandonment activity areas, clear timber, stumps, brush and other vegetation within the marked Project footprint. Clearing methods will take into account land use and landowner/leaseholder requirements.</p> <ul style="list-style-type: none"> If vegetation removal is required to access physical abandonment activity areas, clear timber, stumps, brush and other vegetation within the marked Project footprint. Clearing methods will take into account land use and landowner/leaseholder requirements. Avoid disturbance to environmentally sensitive features during clearing as identified by the appropriate signage and/or fencing. The Environmental Inspector(s) or designate(s) and appropriate Environmental Resource Specialist will determine the size of avoidance buffer surrounding these features, if appropriate. Where practical, leave stumps in place, particularly on streambanks, to provide surface stability. Stumps that are removed will be used as rollback or will be disposed of by burning or chipping, where approved. Where native grassland is identified, site specific mitigation and reclamation measures will be implemented that are consistent 	<p>in these areas and ceasing vegetation management over abandoned lateral pipelines.</p> <p>Residual effects of physical abandonment activities on vegetation communities and species are likely to occur and are predicted to be beneficial as vegetation communities are allowed to re-establish, negligible in magnitude, limited to the PDAs, medium-term in duration and reversible following post-abandonment reclamation. Positive effects on vegetation may also occur following abandonment as communities and species re-establish.</p> <p>Change in invasive plant species density and distribution during physical abandonment activities may occur:</p> <ul style="list-style-type: none"> Weeds may be introduced or spread through vehicle or equipment movement. Mitigation measures to reduce the risk of the introduction or spread of noxious weeds will be applied. <p>Residual effects of physical abandonment activities on invasive plant species density and distribution are likely to occur, and are predicted to be adverse,</p>	<p>Significance With the implementation of mitigation and environmental protection measures, residual cumulative effects on vegetation and wetlands are predicted to be not significant.</p>	

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						<p>with practices outlined in Recovery Strategies for Industrial Development in Native Prairie in the Mixedgrass Natural Subregion of Alberta (Neville et al. 2014) and the Dry Mixedgrass Natural Subregion of Alberta (Gramineae Services Ltd. 2013), as applicable. Specifically:</p> <ul style="list-style-type: none"> • Avoid physical abandonment activities in native grassland during the growing season April to August, if possible. • Prior to the initiation of physical abandonment activities, NGTL will clearly identify the start/end KPs for native grassland intersecting the Project footprint, including access. • In areas of native grassland, use ground protection materials (e.g., mats) for short-term traffic access in native grassland. • In native prairie, topsoil removal from the sod layer will be done in such a manner to minimize scalping. Prairie Protectors and/ or sweepers or equivalent will be used to minimize disturbance to the sod layer. • The timeframe between topsoil stripping and replacement will be reduced. Topsoil stripping and replacement will occur when native vegetation is dormant within the same year and before the next growing season, where feasible. • The Contractor shall ensure that efforts are made to minimize grading to the extent possible. • Dispose of all timber material not salvaged for merchantability or required for access control and/or erosion control through burning or mulching, unless otherwise 	<p>negligible in magnitude, may extend to the LSA, medium-term in duration and reversible following post-abandonment reclamation and invasive plant management.</p> <p>Change in abundance, distribution or function of wetlands will occur during physical abandonment activities:</p> <ul style="list-style-type: none"> • Up to 1.21 ha of wetland communities will be temporarily disturbed during physical abandonment activities. Following physical abandonment, wetland vegetation will be allowed to re- establish. <p>Residual effects of physical abandonment activities on wetlands are likely to occur, and are predicted to be adverse in direction, low in magnitude, will be limited to the PDAs, and medium-term and reversible following completion of physical abandonment activities.</p> <p>Significance With the implementation of mitigation and environmental protection measures, residual Project effects on vegetation and wetland are predicted to be not significant.</p>		

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						<p>directed by the Environmental Inspector(s) or designate(s) and Construction Manager.</p> <ul style="list-style-type: none"> If timber and brush are disposed of by mechanical means (i.e., mulching), the maximum depth of mulch is 5 cm or in accordance with the applicable provincial legislation, whichever depth is less. Obtain landowner authorization prior to initiating mulching activity on private land. Prohibit clearing of extra temporary workspace within a 10 m (minimum) riparian buffer from top of bank of the watercourse unless otherwise approved by the Environmental Inspector(s) or designate(s). This area shall be clearly marked prior to clearing operations. The right-of-way will be narrowed through the riparian area, if feasible. Limit clearing of trees at watercourse crossings to the area required to complete the removal. Shrubs and understory vegetation can be cleared from the trench line and work side areas to facilitate the removal. Following clearing, re-mark all sensitive resources as necessary and supplement markings with signage. Seed riparian and erosion prone areas with a cover crop and/or seed mix that has been approved by the responsible regulatory agency and/ or landowner as soon as feasible after abandonment activities, prior to spring freshet wherever possible. <p><u>Weeds</u></p> <ul style="list-style-type: none"> Use of herbicides on the Project footprint is prohibited unless 			

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						<p>otherwise approved by the Company.</p> <ul style="list-style-type: none"> Restrict the general application of herbicides near rare plants or rare ecological communities. Spot spraying, wicking, mowing, or hand-picking are acceptable measures for weed control in these areas. All equipment, including mats, must be clean and free of soil or vegetative debris prior to use on site. Equipment will be inspected by the Environmental Inspector(s) or designate(s), and if deemed to be in appropriate condition will be approved for use and identified with a suitable marker or tag. Any equipment, including mats, which do not arrive in appropriate condition shall not be allowed to perform any work until it has been cleaned, re-inspected by the Environmental Inspector(s) or designate(s), and deemed suitable for use. Apply mitigations for any locations identified as having listed weed infestations according to applicable regulatory requirements, as identified in the list of Project-specific mitigation measures (Table 2 of the EPP). Salvage and store topsoil/strippings separately where listed weed infestations are identified on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents. Monitor topsoil/strippings piles for weed growth during the course of abandonment and implement corrective measures (e.g., spraying, mowing, hand pulling) 			

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						<p>to avoid infestation when warranted.</p> <ul style="list-style-type: none"> If previously unidentified locations with listed weed infestations or invasive aquatic plants are found on the Project footprint during abandonment, the Environmental Inspector(s) or designate(s) will be contacted and will establish the appropriate mitigation or control procedures prior to continuing abandonment activities in the area. Unless a certificate of weed analysis can be provided, all construction material sources used for supplies of sand, gravel, rock, straw and mulch will be visually inspected to ensure they are free of listed weeds to the extent practical. If sources are suspected as having listed weeds, they shall be sampled, and lab analyzed to ensure they meet the requirements of the responsible regulatory agency prior to obtaining or transporting any material to the Project site. Natural recovery is the preferred method of reclamation in non-agricultural areas on level terrain where erosion is not expected. Where natural recovery is not preferred, seed disturbed areas as per site requirements and as specified by the Environmental Inspector(s) or designate(s). Use a cover crop to assist in weed and erosion control where warranted, or where requested by the landowner. Apply cover crops to the approach slopes of all water crossings where there is a risk of wind and water erosion. 			

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						<p><u>Direct Alteration of Wetlands</u></p> <ul style="list-style-type: none"> The Company will obtain regulatory approval for Project activities occurring within wetlands, as required. Construct the wetland crossings in accordance with the applicable regulatory requirements. Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. Avoid disturbance to environmentally sensitive features during clearing as identified by the appropriate signage and/or fencing. The Environmental Inspector(s) or designate(s) and appropriate Environmental Resource Specialist will determine the size of avoidance buffer surrounding these features, if appropriate. Minimize the removal of vegetation in wetlands to the extent possible. Direct grading away from wetlands. Conduct ground level cutting/mowing/mulching of wetland vegetation instead of grubbing. The method of removal of wetland vegetation is subject to approval by the Company. Following clearing, re-mark all sensitive resources as necessary and supplement markings with signage. Minimize grading within wetland boundary. Do not use temporary workspace within the boundaries of wetlands, unless required for site specific purposes. Temporary workspace within the boundary of a wetland must be approved by 			

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						<p>the Environmental Inspector(s) or designate(s).</p> <ul style="list-style-type: none"> If ground conditions are encountered that create potential for rutting, admixing or compaction, then minimize ground disturbance by using a protective layer such as frost packing, snow, ice, geotextile and fill, rig mats, swamp mats, or access mats between the wetland's root/seed bed and construction equipment. Replace excavation and/or trench material as soon as feasible, and re-establish pre-abandonment contours within wetland boundary to facilitate cross ROW drainage. Where there are permanent or temporary access roads, maintain cross-drainage to allow water to move from one side of the access road to the other. The Contractor will use berms, cross ditches, sediment fencing and/or other appropriate measures to prevent erosion and siltation into adjacent wetland areas, unless otherwise directed by the Company. Refer to the <i>Soil Erosion Contingency Plan</i> (Appendix 1E of the EPP) for additional measures. <p><u>Change in Wetland Function</u></p> <ul style="list-style-type: none"> Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible. Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise directed by the Company. Prohibit the use of herbicides within 30 m of an open body of water, unless the herbicide 			

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						application is conducted by ground application equipment, or otherwise approved by the responsible regulatory agency. <ul style="list-style-type: none"> Conduct ground level cutting/mowing/mulching of wetland vegetation instead of grubbing. The method of removal of wetland vegetation is subject to approval by the Company. Where the open trench has the potential to dewater a wetland, undertake trenching in a manner that prevents the flow of water along the trench. 			
Water Quality and Quantity	Y	<ul style="list-style-type: none"> 22 14 PDAs are within 100 m of a watercourse or waterbody. There are 40 four different watercourses or waterbodies within 100 m of these PDAs. The PDAs for eight isolation points and one cathodic protection site occur within 30 m of a watercourse. Watercourses are within three PDAs; however, no instream works are planned. Water withdrawals may be required to complete physical abandonment activities. Limited excavations will be required to isolate the laterals, remove above-ground facilities, remove select portions of laterals, remove cathodic protection, and cut, fill and cap at select highway and railway crossings. Excavation depth will be limited to the depth of the existing pipelines and facility infrastructure (e.g., pilings). <p>Interactions Interactions with surface water quality and quantity may occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> vegetation removal soil stripping and grading excavation vehicle and equipment movement water withdrawal and release 	Complete	<p>Physical Abandonment Change in surface quality and quantity during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Physical abandonment activity on land adjacent to waterbodies resulting in changes in natural flow patterns. Increased suspended sediment concentrations and transport in surface water due to vegetation clearing, or increased erosion in the PDA. <p>Abandonment in-Place Change to surface water and groundwater quality during abandonment in-place due to:</p> <ul style="list-style-type: none"> Water conduits Interception and movement of water in conduits formed as a result of pipe perforation or collapse Movement of residual contamination in conduits. 	Y	<p>Physical Abandonment</p> <ul style="list-style-type: none"> The location of all discharge areas shall be approved by the Environmental Inspector(s) or designate(s). Water pumping from the Project footprint shall be released onto stable surfaces in a manner that does not cause erosion of soils, or sedimentation of the watercourse. Using filter bags or other appropriate sediment filtering devices, pump water onto stable, well vegetated areas, tarpaulins, sheeting, rocks, sandbags, or into settling ponds. Complete dewatering in a manner that does not cause erosion or allow sediment to re-enter a watercourse or waterbody. Do not permit pumped water to flow directly into any watercourse. If water is released onto private land, landowner consent must be acquired prior to release. The Contractor will ensure the pump intake is elevated to minimize the pumping of sediment. 	<p>Physical Abandonment Change in surface water quality and quantity may occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Vegetation removal, stripping, grading, and excavation, where works occur within 30 m of a watercourse or waterbody. Temporary water diversion for construction of snowfills and ice bridges to access PDAs, and to support hydrovac activities, dust control and/or fire suppression; water diversions could result in limited short-term alteration of surface water quality and quantity. <p>Residual adverse effects of Program abandonment activities on surface water quality and quantity are expected to be negligible in magnitude, may extend into</p>	<p>Cumulative effects are not assessed, as the adverse residual effects of the Program water quality and quantity are predicted to be negligible.</p>	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.</p>

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		<p>Interactions with surface water and groundwater quality and quantity may occur during abandonment-in-place due to:</p> <ul style="list-style-type: none"> • water conduits <p>Where shallow groundwater is present, short-term effects to groundwater quantity may occur during physical abandonment activities.</p>				<ul style="list-style-type: none"> • The Contractor will ensure hoses and pumps are of sufficient length and capacity to transfer water to the desired location. • The Contractor will ensure hoses are in good working condition, and hoses with tears or ruptures will be repaired or replaced. • Where water erosion is evident, and there is potential for runoff from the Project footprint to flow into a watercourse, refer to the <i>Soil Erosion Contingency Plan</i> (Appendix 1E of the EPP). • Construct/install all watercourse vehicle crossings as outlined in Table 3 of the EPP, if applicable, and in accordance with the typical drawings (Appendix 1D of the EPP, Dwgs. STDS-03-ML-05-101, STDS-03-ML-05-103 and 000871-2020-MP-08-0001 00). • Under frozen conditions, and where conditions permit, employ ice and snowfill bridges as temporary crossing structures. Install ice and snowfill bridges using non-chlorinated water drawn from an approved source and/or clean snow ploughed in from surrounding areas or produced through snowmaking. <p>Abandonment In-Place</p> <ul style="list-style-type: none"> • All lateral pipeline isolations will involve cutting, purging (i.e., emptied of service fluids and left without any internal pressure), cleaning of any liquid or debris, and capping. • If issues associated with the abandoned pipelines are identified in the future, NGTL will work with stakeholders and the CER, as needed, to appropriately respond to those issues. 	<p>the LSAs, will be short term in duration, and occur as a single event. The residual effects will be reversible after activities are complete.</p> <p>Abandonment In-Place Change in surface water and groundwater quality during abandonment in-place may occur due to the following:</p> <ul style="list-style-type: none"> • Water conduits may develop over the long-term due to pipeline corrosion and subsequent water infiltration. However, segmentation activities and natural topography are expected to be sufficient to prevent movement of water beyond a local scale. • The potential for the pipelines to transport contaminants is low due to cleaning of liquid any liquid and/or debris and capping. <p>Residual adverse effects, if they occur, are expected to be negligible in magnitude, may extend to the LSAs, and short to medium-term in duration (depending on when the effect occurs, when it is discovered and how soon it can be addressed).</p> <p>Significance With the implementation of preventative and response</p>		

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						Maintaining documentation on where the pipelines are abandoned in-place and communicating this information to landowners, lessees and regional authorities (e.g., municipalities) will reduce potential for effects on other land users, particularly in relation to depth of cover or exposure concerns.	measures, residual effects of the Program on surface and groundwater quality and quantity are predicted to be not significant.		
Fish and Fish Habitat	Y	<ul style="list-style-type: none"> There are no instream works planned as part of the Program. The abandonment program activities include eight isolation points and one cathodic protection site that have PDAs within 30 meters of a waterbody. Abandonment activities occurring greater than 30 m from waterbodies are unlikely to have interactions with and subsequent effects on instream and riparian habitats, therefore, they have not been considered in the assessment of fish and fish habitat. Sensitive fish species are documented in watercourses within 30 m of a PDA as follows: <ul style="list-style-type: none"> one fish species (rainbow trout) listed as “endangered” on Schedule 1 of Species at Risk Act as well as by COSEWIC, and “at risk” under the Alberta Wildlife Act, at one isolation point. two fish species (arctic grayling and spoonhead sculpin) listed as “may be at risk” under the Alberta Wildlife Act at the same isolation point. one fish species (largescale sucker) listed as “sensitive” under the <i>Alberta Wildlife Act</i> at one cathodic protection site Water withdrawals may be required to complete physical abandonment activities. <p>Interactions Interactions with fish and fish habitat may occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> vegetation removal 	Complete	<p>Physical Abandonment Change in fish habitat during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Abandonment activity on land adjacent to waterbodies resulting in changes to bank stability, loss of riparian habitat, sedimentation, or increased erosion potential. <p>Changes in fish mortality risk during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Abandonment activities that may degrade water quality through the introduction of sediments or sediment laden water. 	Y	<p>Physical Abandonment</p> <ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. Do not permit fording of watercourses, unless otherwise approved by the Company. Where approved by the Company, for the one-time (over and back) fording of equipment without a temporary crossing structure, use streambank and bed protection methods (e.g., matting), as directed by the Environmental Inspector(s) or designate(s). Construct or install temporary vehicle access across waterbodies, shorelines, and riverbanks in a manner that protects the banks from erosion, maintains the flows in the waterway, and is completed in accordance with applicable guidelines, environmental protection measures, approval conditions or legislation, including applicable DFO Measures to Protect Fish and Fish Habitat and DFO Standards and Codes of Practice (DFO 2019, 2021). Water pumping from the Project footprint shall be released onto stable surfaces in a manner that does not cause erosion of soils, 	Residual effects of physical abandonment activities on fish and fish habitat are unlikely to occur and are predicted to be adverse, negligible in magnitude, may extend into the LSA, will be short-term in duration and reversible following completion of physical abandonment activities and reclamation.	Cumulative effects are not assessed, as the adverse residual effects of the Program on fish and fish habitat are predicted to be negligible.	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program’s Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program’s Abandoned Pipeline Monitoring Plan.</p>

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		<ul style="list-style-type: none"> • soil stripping and grading • vehicle and equipment movement • water withdrawal and release <p>Interactions with fish and fish habitat during abandonment in-place are excluded because no further vegetation removal or ground disturbance is required.</p>				<p>or sedimentation of the watercourse.</p> <ul style="list-style-type: none"> • Do not permit pumped water to flow directly into any watercourse. If water is released onto private land, landowner consent must be acquired prior to release. • The Contractor will ensure the pump intake is elevated to minimize the pumping of sediment. • Install erosion and sediment control at all watercourses and/or waterbodies unless otherwise approved by the Environmental Inspector(s) or designate(s) (Appendix 1D of the EPP, Dwgs. STDS-03-ML-05-001, STDS-03-ML-05-131, STDS-03-ML-05-132, STDS-03-ML-05-137). • Prohibit clearing of extra TWS within a 10 m (minimum) riparian buffer from top of bank of the watercourse unless otherwise approved by the Environmental Inspector(s) or designate(s). This area shall be clearly marked prior to clearing operations. The right-of-way will be narrowed through the riparian area, if feasible. If the working surface is unstable, do not permit clearing equipment within the 10 m riparian buffer, unless otherwise approved by the Environmental Inspector(s) or designate(s). Following clearing, the 10 m riparian buffer will remain intact (i.e., consisting of low-lying understory vegetation). • Where water erosion is evident, and there is potential for runoff from the Project footprint to flow into a watercourse, refer to the 			

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						Soil Erosion Contingency Plan (Appendix 1E of the EPP).			
Wildlife and Wildlife Habitat	Y	<ul style="list-style-type: none"> Physical abandonment activities include ground disturbance in 115 PDAs. The PDAs are largely within existing facility site boundaries and/or existing ROWs, however, TWS outside of ROW/facility boundaries may be required. The total area of all PDAs is 20.01 ha, including approximately 2.96 ha of native grassland vegetation, 0.16 ha of shrubland, 0.31 ha of broadleaf forest, 0.04 ha of coniferous forest and 0.08 ha of mixedwood forest. 153.45 km of lateral pipelines will be abandoned in-place, 0.51 km of lateral pipelines will be removed, Vegetation within the lateral ROWs is previously disturbed and is generally assumed to provide wildlife habitat for species that use or move through open areas. The Program has a limited scope, relatively small workforce (up to approximately 20 workers), and a short duration of physical abandonment activities (from 2 to 4 weeks for each PDA). Physical abandonment 	Complete	<p>Physical Abandonment Change to habitat during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Direct loss or alteration of habitat from vegetation removal and ground disturbance. Direct gain or alteration of habitat following removal and/or abandonment of infrastructure. Indirect loss or alteration of habitat effectiveness through sensory disturbance. <p>Change in mortality risk during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Project-related works and activities resulting in physical destruction of key habitat features (e.g., nests, dens, roosts). Vehicle-wildlife collisions. 	Y	<p>Physical Abandonment <u>Change in Wildlife Habitat</u></p> <ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. Minimize the removal of vegetation in wetlands to the extent possible. Prior to the start of abandonment activities, clearly mark all sensitive resources as identified on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents and in the Project-specific mitigation tables (Tables 2 and 3 of the EPP). The Contractor shall provide a grade plan to the Company, or as specified in the contract documents. The grade plan will be reviewed by the Environmental Inspector(s) or 	Change to habitat during physical abandonment activities will occur: <ul style="list-style-type: none"> Up to 2.96 ha of native grassland vegetation, 0.16 ha of shrubland, 0.43 ha of forest, and 1.21 ha wetland habitat, resulting in direct temporary loss or alteration of habitat for wildlife. The remainder of the PDAs contain disturbed, open habitat, which will be re-disturbed in the short-term by physical abandonment activities. Following physical abandonment, no further brushing for operational requirements will be undertaken. Wildlife habitat near the PDAs may become less suitable during physical 	<p>Past and present projects and physical activities have influenced the baseline conditions for wildlife and wildlife habitat. Forestry, oil and gas, and agriculture are ongoing throughout the Program Component areas and are anticipated to continue in the future, and new development of industrial, infrastructure, residential or commercial activities has the potential to occur in the future.</p> <p>The Program is expected to make a negligible contribution to ongoing cumulative effects on wildlife and wildlife habitat at the</p>	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.</p>

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		<p>activities in any one area will be limited in extent and duration.</p> <ul style="list-style-type: none"> Based on a review of species ranges, there is the potential for 81 species at risk and species of management concern to occur within the wildlife regional study area, comprising of 30 bird species, twelve mammal species, four amphibian species, four reptiles, and five arthropods. Three Program Components overlap with key wildlife biodiversity zones. Five Program Components overlap with federally and provincially designated boreal caribou ranges There are two PDAs, totalling 1.02 ha within mapped caribou habitat, of which 0.42 ha is new short-term direct disturbance and 0.60 ha is on existing permanent disturbance (e.g., industrial sites, roads). 38 Program Components overlap with grizzly bear secondary recovery zones: 97 Program Components overlap Sensitive Raptor Range (Prairie Falcon, Golden Eagle, Ferruginous Hawk, Bald Eagle). 37 Program Components overlap with sensitive amphibian range. 11 Project components overlap with sensitive snake range and sensitive snake hibernacula range. <p>Interactions Interactions with wildlife and wildlife habitat could occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> vegetation removal soil stripping and grading excavation/ trenching vehicle and equipment movement increased noise increased traffic <p>Interactions with wildlife and wildlife habitat during abandonment in-place are excluded because no further vegetation removal or ground disturbance is required.</p>				<p>designate(s) to ensure identified environmental resources are addressed as per Program commitments.</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. If physical abandonment activities (including clearing and reclamation) are scheduled to commence during the owl nesting period (April 15-August 15) refer to the <i>Breeding Bird and Nest Management Plan</i> (Appendix 1F in the EPP). In the event an active nest is found or breeding behavior is observed, it will be subject to site-specific mitigation measures based on the <i>Breeding Bird and Nest Management Plan</i>. Using a combination of minimal disturbance techniques and natural regeneration, allow PDAs to re-vegetate within grizzly bear recovery zones with vegetative species compatible and consistent with the adjacent vegetation type. Ensure that noise abatement equipment on machinery is in working order. Where active sharp-tailed grouse leks are identified, no physical abandonment activities (including clearing and reclamation) will occur within 500 m of the lek during the lekking period or within 100 m outside of the lekking 	<p>abandonment activities due to sensory disturbance to wildlife (e.g., light, noise).</p> <ul style="list-style-type: none"> The removal of above-ground facilities may result in positive effects on wildlife habitat in the long-term where graveled surfaces are removed, and native vegetation is allowed to re-establish. <p>Residual effects of physical abandonment activities on wildlife habitat are likely to occur, and are predicted to be adverse, low in magnitude, extend locally, medium-term in duration and reversible following completion of physical abandonment activities. Positive effects on wildlife habitat may also occur following abandonment.</p> <p>Change in mortality risk during physical abandonment activities may occur:</p> <ul style="list-style-type: none"> Mortality risk for wildlife could increase during physical abandonment through accidental wildlife-vehicle collisions, entrapment in excavations, human-wildlife conflicts, or direct and indirect (i.e., sensory) disturbance of occupied wildlife habitat features such as dens. Where amphibian or snake species at risk or 	<p>regional scale and may contribute positively through wildlife habitat restoration and reclamation where vegetation management ceases and above-ground facilities are removed.</p> <p>Significance With the implementation of mitigation and environmental protection measures, residual cumulative effects on wildlife and wildlife habitat are predicted to be not significant.</p>	

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						<p>period. Exceptions will be reviewed by the Company and a Resource Specialist on a case-by-case basis and will only be considered for equipment / vehicle travel. Marshalling of vehicles through setback can occur from March 15 to June 15 between 10:00 AM and 4:00 PM.</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within the caribou RAP (February 15 through July 15) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEPA and implement appropriate mitigation measures to reduce Project effects on caribou populations and caribou habitat. Following completion of physical abandonment activities in caribou range, access management measures and habitat restoration will be completed using measures appropriate to the site type and surrounding vegetation. Follow Reclamation Measures outlined in Section 8.7 of the EPP. Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. Avoid physical abandonment activities (including clearing and reclamation) within the Key Wildlife and Biodiversity Zone (KWBZ) RAP (January 15 through April 30) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEPA and 	<p>species of management concern may occur, mortality risk due to entrapment in excavation, vehicle interactions and site clearing will be addressed through mitigation.</p> <p>Residual effects of physical abandonment activities on wildlife mortality risk are possible. If they occur, residual effects are predicted to be adverse, negligible in magnitude, extend locally, short-term in duration and reversible following completion of physical abandonment activities.</p> <p>Significance With the implementation of mitigation and environmental protection measures, residual Project effects on wildlife and wildlife habitat are predicted to be not significant.</p>		

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						<p>implement appropriate mitigation measures to reduce Project effects on wildlife.</p> <p><u>Change in Mortality Risk</u></p> <ul style="list-style-type: none"> • Prior to the start of abandonment activities, clearly mark all sensitive resources as identified on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents and in the Project-specific mitigation tables (Tables 2 and 3 of the EPP). The Company will develop an environmental orientation that will be delivered to ensure that all personnel working on the Project are informed of Project specific environmental requirements and sensitivities, before being allowed access to the Project site. • Avoid disturbance to environmentally sensitive features during clearing as identified by the appropriate signage and/or fencing. The Environmental Inspector(s) or designate(s) and appropriate Environmental Resource Specialist will determine the size of avoidance buffer surrounding these features, if appropriate. • In the event construction and/or clean-up activities are scheduled to occur within the Primary Nesting Period for the Bird Conservation Region for migratory birds, refer to the <i>Breeding Bird and Nest Management Plan</i> (Appendix 1F of the EPP). • In the event an active nest is found, it will be subject to site-specific mitigation measures (i.e., clearly marked protective buffer 			

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						<p>around the nest and/or non-intrusive monitoring) based on the <i>Breeding Bird and Nest Management Plan</i>.</p> <ul style="list-style-type: none"> Project personnel are prohibited from hunting or fishing on the Project footprint, and from harassing, feeding, collecting or possessing wildlife species. Do not harass or feed wildlife or livestock. Do not permit Project personnel to have dogs on the Project footprint. Firearms are not permitted in Project vehicles or on the Project footprint, or at associated Project facilities. In addition, prohibit the recreational use of all-terrain vehicles (ATVs) or snowmobiles by Project personnel on the Project footprint. Report any incidents with wildlife to the Environmental Inspector(s) or designate(s) immediately. Where practicable and applicable, use multi-passenger vehicles for the transport of crews to and from job sites. Unanticipated wildlife issues encountered during abandonment activities will be discussed and resolved by the Environmental Inspector(s) or designate(s), Wildlife Resource Specialist(s), and the responsible regulatory agencies, if necessary. The Contractor will monitor the open excavation/trench for trapped wildlife. Should any wildlife be identified, the Contractor will contact the Environmental Inspector(s) or designate(s) and Construction Manager. The Environmental Inspector(s) or designate(s) will contact the responsible regulatory agency or a Wildlife 			

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						Resource Specialist, where required, for direction. <ul style="list-style-type: none"> If previously unidentified listed or sensitive wildlife species or their site-specific habitat (e.g., dens, nests) are identified during Project abandonment activities, report to the Environmental Inspector(s) or designate(s) and implement the <i>Wildlife Species of Concern Discovery Contingency Plan</i> (Appendix 1E of the EPP). The Contractor will collect all Project debris and other waste materials and dispose of daily at an approved facility and in accordance with the <i>Chemical and Waste Management Plan</i> (Appendix 1F of the EPP) and the <i>Release Contingency Plan</i> (Appendix 1E of the EPP) unless otherwise authorized by the Environmental Inspector(s). Report sightings of Project-specific species of interest to the Environmental Inspector(s) or designate(s). Specific protection measures may be implemented, and the sighting will be recorded. Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. If caribou are encountered on roads, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area. Where physical abandonment activities (including clearing and reclamation) within grizzly bear recovery zones are scheduled during the bear denning period (October 1 to April 30), a grizzly 			

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						<p>bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation.</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity. Where breeding wetlands are identified within 100 m of the Project footprint, install exclusion fencing around the portion of the Project footprint that overlaps the wetland and/or its 100 m buffer or suitable length based on site conditions as determined by the Environmental Inspector(s) or designate(s) and the Wildlife Resource Specialist prior to physical abandonment activities. Undertake searches of the fenced area and relocate encountered amphibians to suitable habitat outside the exclusion area. Where exclusion fencing is not feasible, undertake area searches daily prior to activity and relocate amphibians to suitable habitat away from the 			

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						<p>workspace (relocation sites to be determined in field).</p> <ul style="list-style-type: none"> If a relocation program is required, a permit for the capture and handling of amphibians will be obtained from AEPA prior to commencing the relocation program. All handling procedures will follow Alberta Wildlife Animal Care Committee Class Protocol #003 – Capture and Handling of Amphibians. The capture and handling of amphibians will occur under the direction of a qualified Wildlife Resource Specialist. If physical abandonment activities (including clearing and reclamation) are scheduled to commence during the raptor nesting period or migratory bird PNP (March 15 to August 31, inclusive) (ECCC 2018; Gregoire 2020, pers. comm.; GOA 2021a), refer to the <i>Breeding Bird and Nest Management Plan</i> (Appendix 1F in the EPP). In the event an active nest is found or breeding behaviour is observed, it will be subject to site-specific mitigation measures (i.e., clearly marked protective buffer around the nest and/or non-intrusive monitoring) based on the <i>Breeding Bird and Nest Management Plan</i>. PDA's within sensitive snake habitat range and sensitive snake hibernacula range will be swept daily for snakes prior to activity by appropriately trained personnel if physical abandonment activities occur during the snake active period (April 1 to October 31). Snakes encountered within the work area will be relocated to suitable habitat away from the work area 			

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						as determined on a site-specific basis. <ul style="list-style-type: none"> If a snake relocation program is required, a permit for the capture and handling of snakes will be obtained from AEPA prior to commencing the relocation program. Snake relocation will follow appropriate capture and handling guidelines. Reduce vehicle speed limits on all access roads within sensitive snake habitat range (< 50 km/hr on grid roads, and <30 km/hr on gravel roads/trails) during the snake active period (April 1 to October 31) to reduce snake mortality risk. 			
Species at Risk, or Species of Special Status, and Related Habitat		See Vegetation and Wetlands, Fish and Fish Habitat, and Wildlife and Wildlife Habitat							
Air Emissions	Y	Interactions with air quality will occur during physical abandonment activities due to the release of criteria air contaminants (CACs) from vehicle and equipment use, and dust from mobile equipment and material handling. <ul style="list-style-type: none"> There are 18 meter stations located within 2 km of residential sensitive receptors, with the closest resident approximately 200 m away from a PDA. The majority of CAC emissions from mobile equipment will occur on public roads for daily commuting between the work site and worker accommodations. The Program has a limited scope, relatively small workforce (up to approximately 20 workers), and a short duration of physical abandonment activities (from 2 to 4 weeks for each PDA). Physical abandonment activities in any one area will be limited in extent and duration. Interactions with abandonment in place activities are not predicted because there will be no emissions from the abandoned facilities.	Complete	Physical Abandonment Change in ambient air quality may occur during physical abandonment activities due to: <ul style="list-style-type: none"> CAC emissions from equipment and vehicles Dust from mobile equipment Dust from material handling 	Y	Physical Abandonment <ul style="list-style-type: none"> Reduce idling of equipment, where possible. The Contractor will ensure equipment is well-maintained. Where practical and applicable, use multi-passenger vehicles for the transport of crews to and from job sites. Timber and brush disposal options are subject to agreements with landowners, occupants and the responsible regulatory agency where public lands are intersected. Dispose of all timber material not salvaged for merchantability or required for access control and/or erosion control through burning or mulching, unless otherwise directed by the Environmental Inspector(s) or designate(s) and Construction Manager. 	<ul style="list-style-type: none"> The estimated emissions of CACs total in tonnes (t) from Program activities are as follows: TSP (1545 t), PM10 (661 t), PM2.5 (66 t), CO (1 t), NOX. (2.14 t), and SO2. (<1 t). Compared to the Canadian and Alberta 2021 total emissions (Table 13.2-1; ECCC 2023), the estimated emissions of CACs from Program activities are less than 0.01% of the Canadian totals and less than 0.03% of the Alberta totals, for all CAC parameters. 	If CAC emissions are being generated by the Program in the same landscape geographic extent and same time as other projects, the combined CAC emissions have the potential to further increase the ambient CAC concentrations in the area, compared to only the Program emissions or only other project emissions. Based on the descriptions of the other projects, the CAC emissions from the other projects are expected to be low or medium.	Based on the results of the assessment, no atmospheric monitoring programs are warranted.
							If CAC emissions from the Program combine		

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						<ul style="list-style-type: none"> Obtain applicable permits prior to burning. Follow guidance in the applicable legislation. Implement techniques to limit smoke production including limiting pile size, minimizing moisture content and maintaining loose burning piles with minimal soil. 		<p>with the other projects, it is expected the magnitude of the combined emissions will be moderate or lower.</p> <p>Given the application of the proposed mitigation measures listed in and the EPP, the residual cumulative effects of the Program CAC emissions are predicted to be adverse, medium magnitude, short-term, sporadic events within the LSA.</p> <p>Significance With the application of mitigation measures for the Program, its contribution to residual cumulative effects on the ambient air quality at known receptors are predicted to be not significant.</p>	
Greenhouse Gas (GHG) Emissions	Y	<p>The total estimated Scope 1 GHG emissions for the Program is 3.8 kt CO₂e, not including land-use change related GHG sources or sinks:</p> <ul style="list-style-type: none"> 2.6 kt CO₂e of the emissions are from vehicles and equipment. 1.2 kt CO₂e of the Scope 1 GHG emissions are due to purging of the existing pipelines. <p>Clearing of trees will be avoided, where feasible. Shrubs and understory vegetation will be cleared to facilitate physical abandonment activities and will regrow following reclamation.</p> <p>Because the Program involves abandonment activities and there is no operations phase,</p>	Complete	<p>Physical Abandonment Release of direct GHG emissions will occur during physical abandonment activities from:</p> <ul style="list-style-type: none"> equipment and vehicles burning hydrocarbon fuel vegetation removal purging of the lateral pipelines. 	Y	<p>Physical Abandonment</p> <ul style="list-style-type: none"> Reduce idling of equipment, where possible. The Contractor will ensure equipment is well maintained. Where practical and applicable, use multi-passenger vehicles for the transport of crews to and from job sites. Natural recovery is the preferred method of reclamation in non-agricultural areas on level terrain where erosion is not expected. Where natural recovery is not preferred, seed disturbed areas as per site requirements and as 	<p>The estimated direct GHG emissions from physical abandonment activities (i.e., vehicle and equipment emissions, purging the existing lines) comprise 0.0004% and 0.001% of the Canada and Alberta GHG emission totals, respectively, using the year 2020 Canada and Alberta GHG emission totals as a baseline.</p> <p>GHG emissions from vegetation removal will be temporary and are</p>	<p>Cumulative effects associated with the releases of GHGs are a global issue and are not limited to provincial or national borders. GHG sources, sinks, and reservoirs around the world contribute to the cumulative effect.</p> <p>Due to their small magnitude, Program-related GHG emissions are not expected to hinder the achievement of Canada's GHG emissions targets, and</p>	Based on the results of the assessment, no atmospheric monitoring programs are warranted.

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		<p>there are no new upstream GHG emissions associated with the Program.</p> <p>Interactions will occur during physical abandonment due to the release of GHG emissions from the following activities:</p> <ul style="list-style-type: none"> • vehicle and equipment movement, including worker transportation • vegetation removal • purging (emptying of service fluid) of the existing pipelines. <p>As no additional power draw is anticipated to support physical abandonment activities, no third-party (indirect) emissions are predicted.</p> <p>An increase in upstream emissions is not predicted.</p>				specified by the Environmental Inspector(s) or designate(s).	<p>expected to be reversed by reclamation.</p> <p>The Program will not hinder the Government of Canada's efforts to reduce GHG emissions.</p>	do not warrant further cumulative effects assessment.	
Acoustic Environment	N	<p>Excluded because any change in noise levels as a result of physical abandonment activities will be temporary and short-term.</p> <p>As a result of abandonment, any current operations-related noise will cease, which is considered an overall benefit.</p> <p>Interactions with the acoustic environment are not predicted as a result of abandonment in place.</p>	N/A	None	N	N/A	None	None	N/A
Human Occupancy and Resource Use	Y	<ul style="list-style-type: none"> • The Program Components are located on both freehold and Crown land that is currently held under disposition, lease and/or easement by NGTL. • The Program Components are located in the Green Area and White Area of Alberta. • Physical abandonment activities include ground disturbance at PDAs. The PDAs are largely within existing facility site boundaries and/or existing ROWs; however, TWS outside of ROW/facility boundaries may be required. • The Program Components are located on and adjacent to lands used for agriculture, forestry, oil and gas activities, recreation 	Complete	<p>Physical Abandonment Change to access and land use during physical abandonment activities due to:</p> <ul style="list-style-type: none"> • Loss of access to or alteration of use of land for: <ul style="list-style-type: none"> • Agriculture, including crops and grazing • Timber harvesting • Industrial uses including oil and gas exploration/development • Areas important for tourism and recreation including hunting, trapping, and fishing 	Y	<p>Physical Abandonment</p> <ul style="list-style-type: none"> • Inform all responsible federal and provincial resource agencies and interested municipal officials of the Project activities as warranted. • Notify potentially affected landowners, lessees and nearby residents of the intended Project schedule before the start of abandonment activities to avoid or reduce impacts to their operations or activities. • Provide potentially affected Indigenous groups with the 	<p>Change to access and land use during physical abandonment activities may occur:</p> <ul style="list-style-type: none"> • Temporary access disruptions to third-party land users during physical abandonment activities. • Temporary sensory disturbance due to vehicle and equipment movement, and presence of workers may disturb local land 	<p>Other land use and development activity may overlap with the Program abandonment activities and may act cumulatively to affect access and land use.</p> <p>Abandonment activities will primarily take place within and adjacent to previously disturbed land, land that is held under disposition/lease by NGTL, and within</p>	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to</p>

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		<p>(hunting, fishing, all-terrain vehicle/snowmobile use), and trapping.</p> <ul style="list-style-type: none"> The Program has a limited scope, relatively small workforce (up to approximately 20 workers), and a short duration of physical abandonment activities (from 2 to 4 weeks for each PDA). Physical abandonment activities in any one area will be limited in extent and duration. <p>Interactions</p> <p>Interactions with human occupancy and resource use could occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> vegetation removal soil stripping and grading excavation vehicle and equipment movement increased noise increased traffic increased air emissions and/or dust. <p>Interactions with human occupancy and resource use during abandonment in-place are excluded because no further access restrictions are required.</p> <p>Where infrastructure is removed and equivalent land use and capability is achieved, residual effects are predicted to be positive.</p>				<p>proposed abandonment activities schedule and maps. Notify registered trappers at least 10 days prior to abandonment activities.</p> <ul style="list-style-type: none"> Clearly delineate areas that have access restrictions. Restrict access to Project personnel only. Post signage to discourage unauthorized public access onto the Project footprint during abandonment activities. Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. For other access measures and guidelines on the Project footprint and associated access roads, refer to the <i>Traffic Control Management Plan</i> (Appendix 1F of the EPP). Machine clean-up activities will follow completion of abandonment activities as closely as feasible. Take reasonable measures to control Project related noise near residential areas. Where practicable and applicable, use multi-passenger vehicles for the transport of crews to and from job sites. Ensure that noise abatement equipment on machinery is in good working order. 	<p>users during physical abandonment activities.</p> <p>Residual effects of abandonment activities on access and land use are predicted to be adverse in direction, short-term and occurring once, of low magnitude, and restricted to the LSAs. The effects are reversible.</p> <p>Physical Abandonment Activities have the potential to result in short-term effects to wildlife resources including game species in the LSAs. The long-term availability or quality of game in the LSAs and RSAs will not be affected. Therefore, the potential residual effects of the Project on the availability of wildlife, as a resource for hunting and trapping activities in the LSAs, is predicted to be adverse in nature, low in magnitude, short term in duration, constrained to the LSAs, and reversible following the completion of construction activities.</p>	<p>facility site boundaries. Disturbed land will be reclaimed and returned to equivalent land capability following completion of abandonment activities, which will make land available for other uses such as agriculture, forestry, hunting, and trapping.</p> <p>The Program is predicted to make a negligible contribution to cumulative residual effects at the regional scale.</p> <p>Removal of infrastructure, such as meter stations, may contribute positively through making more land available to other land uses.</p>	the Program's Abandoned Pipeline Monitoring Plan.
Heritage Resources (both Crown and private lands)	N	<ul style="list-style-type: none"> Excluded because HRA clearance from Alberta Ministry of Culture will be received prior to physical abandonment activities. Approval conditions are expected to align with NGTL's <i>Cultural Resource Discovery Contingency Plan</i> as part of the EPP (Appendix A). Interactions with heritage resources are not predicted as a result of abandonment in place. 	Underway – HRA applications will be completed for required PDAs prior to physical abandonment activities commencing.	None	N	N/A	None	None	N/A

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Navigation and Navigation Safety	N	<ul style="list-style-type: none"> Excluded because abandonment activities will not be located in, on, over, under, through or across as navigable waterway as defined by the Canadian <i>Navigable Waters Act</i> List of Scheduled Waters. 	N/A	None	N	N/A	None	None	N/A
Indigenous Traditional Land and Resource Use	Y	<ul style="list-style-type: none"> NGTL is engaging 44 potentially affected Indigenous groups. No outstanding site-specific Program issues or concerns have been identified by engaged Indigenous groups to date. However, this assessment assumes that areas within or near the PDAs on Crown land may support resources or contain areas or sites that are currently used for traditional purposes. The results of engagement are summarized in the Application. Specific potential interactions are provided below. The PDAs occur within the identified traditional territories, regional boundaries and/or areas of interest of 44 Indigenous groups, including Treaty 6, 7 and 8 First Nations, Indigenous and Métis groups. The Program Components are located on both freehold and Crown land that is currently held under disposition, easement or lease by NGTL. Physical abandonment activities include ground disturbance in 115 PDAs. The PDAs are largely within existing facility site boundaries and/or existing ROWs, however, TWS outside of ROW/facility boundaries may be required. The total area of all PDAs is 20.01 ha, including approximately 2.96 ha of native grassland vegetation, 0.16 ha of shrubland, 0.31 ha of broadleaf forest, 0.04 ha of coniferous forest and 0.08 ha of mixedwood forest. 153.45 km of lateral pipelines will be abandoned in-place, and 0.51 km of laterals will be removed. Much of the vegetation within the lateral ROWs is previously disturbed and is generally assumed to be regenerating. 	Underway	<p>Physical Abandonment Change in the availability, quality, quantity of and/or access to traditional resources, including change to timing and/or seasonality of resources and/or activities, due to:</p> <ul style="list-style-type: none"> Loss or alteration of traditionally used plant, wildlife or fish species or water sources. Loss or alteration of habitat supporting traditionally used plant, wildlife or fish species or water sources. Loss or alteration of ability to access traditionally used resources due to sensory disturbance or access restrictions. <p>Change in current traditional use sites or areas and/or in access to these sites or areas, including change to timing and/or seasonality of availability/suitability for activities due to:</p> <ul style="list-style-type: none"> Alteration of currently used harvesting, habitation, and cultural or spiritual sites and areas. Alteration of currently used trails and travelways or of features used in wayfinding. Air quality or water quality, or sensory disturbances that have the potential to influence the conditions for current use. 	Y	<p>Physical Abandonment For mitigation related to loss or alteration of traditionally used plant, wildlife or fish species or water sources and habitat supporting these resources</p> <ul style="list-style-type: none"> See the Vegetation and Wetland element of this table. See the Soil and Soil Productivity element of this table. See the Wildlife and Wildlife Habitat element of this table. See the Fish and Fish Habitat element of this table. See the Water Quality and Quantity element of this table. <p>For mitigation of alteration of currently used harvesting, habitation, and cultural or spiritual sites and areas:</p> <ul style="list-style-type: none"> Provide potentially affected Indigenous groups with the proposed abandonment activities schedule and maps. The Company will develop an environmental orientation that will be delivered to ensure that all personnel working on Project construction are informed of Project-specific environmental requirements and sensitivities, before being allowed access to the Project site. Notify registered trappers at least 10 days prior to abandonment activities. Prior to the start of abandonment activities, clearly mark all sensitive resources as identified 	While the Program will primarily impact previously disturbed lands, removal of vegetation and ground disturbance may affect the availability, quality, quantity of and access to species of importance for Traditional Land and Resource Use (TLRU) by causing a temporary and direct alteration of habitat for wildlife and plant species and affecting habitat function by temporarily disturbing it and decreasing its area. Adverse effects to the availability, quality and/or quantity of traditional resources are expected during Program physical abandonment activities but not beyond. Physical abandonment activities may temporarily impede access to traditional used resources and abandonment activities, including vehicle and equipment movement, may result in a temporary change in access to traditionally used resources. The Program may ultimately restore some access, as well as the capacity of the affected lands. On this basis, adverse residual effects on traditional resources and associated activities are	As residual effects on TLRU for the Program have been characterized as negligible, no cumulative effects assessment has been completed.	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.</p>

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		<p>Interactions Interactions with traditional land and resource use could occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> • vegetation removal • soil stripping and grading • vehicle and equipment movement • increased noise • increased traffic <p>Interactions with traditional land and resource use during abandonment in-place are not predicted as access will not be decreased and in some cases may be improved following completion the Program.</p>				<p>on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents and in the Project specific mitigation tables (Tables 2 and 3 of the EPP).</p> <ul style="list-style-type: none"> • Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. • If previously unidentified TLRU sites are found on the footprint during to Program abandonment activities, implement the measures outlined in the <i>Cultural Resource Discovery Contingency Plan</i>. <p>For mitigation of alteration of currently used trails and travelways or of features used in wayfinding:</p> <ul style="list-style-type: none"> • Provide potentially affected Indigenous groups with the proposed abandonment activities schedule and maps. • Post signage to discourage unauthorized public access onto the Project footprint during abandonment activities. • Clearly delineate areas that have access restrictions. Restrict access to Project personnel only. • Notify registered trappers at least 10 days prior to abandonment activities. • Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. • For other access measures and guidelines on the Project footprint and associated access roads, refer to the <i>Traffic Control</i> 	<p>assessed to be negligible in magnitude, short term in duration, one time only, local or landscape in extent, largely confined to disturbed areas, and reversible.</p> <p>The Program may affect current traditional use sites or areas and/or access to these sites or areas by altering culturally important characteristics, features or sites; causing sensory disturbances; and/or limiting or precluding access during but not beyond physical abandonment activities.</p> <p>Traditional use sites or areas with associated provincial heritage sensitivity values will not be affected; HRA applications will be submitted and HRA clearance will be received for required PDAs prior to commencement of Program activities. No current traditional use sites or areas have been identified to date and so none will be directly affected by abandonment activities. Sensory disturbance (e.g., noise) may affect current use site, if they occur in the LAAs.</p> <p>Access to current use sites or areas in the LSA is expected to be limited during Program abandonment activities,</p>		

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						<p><i>Management Plan</i> (Appendix 1F of the EPP).</p> <p>For mitigation related to air quality or water quality or sensory disturbances that have the potential to influence the conditions for current use:</p> <ul style="list-style-type: none"> • See the Air Emissions element of this table. • See the Water Quality and Quantity element of this table. • See the Human Occupancy and Resource Use element of this table. 	<p>which are anticipated to be 2 to 4 weeks per site.</p> <p>Given these circumstances, residual effects on traditional land use areas or sites that may exist outside the PDAs or to access to these areas or sites will be negligible in magnitude, long-term, one time only, local, confined to disturbed areas and reversible.</p>		
Social and Cultural Well-Being	N	<ul style="list-style-type: none"> • Excluded because there are no anticipated interactions with social and cultural well-being, as physical abandonment activities have a limited scope, relatively small workforce requirements and short duration. The temporary workforce required for the Project will be accommodated using commercial accommodations in nearby towns and cities (e.g., hotels, rental units, campgrounds). • Interactions with social and cultural well-being are not predicted during physical abandonment or abandonment in place. 	N/A	None	N	N/A	None	None	N/A
Human Health or Aesthetics	N	<ul style="list-style-type: none"> • Excluded because there are no anticipated interactions with human health, as physical abandonment activities have a limited scope, relatively small workforce requirements and short duration. • Aesthetics are excluded from consideration during the abandonment phase because the pipeline will be abandoned in place and above-ground facilities will be removed as part of physical abandonment. As a result of abandonment, any effects on aesthetics related to the ongoing presence of above-ground facilities will cease. 	N/A	None	N	N/A	None	None	N/A
Infrastructure and Services	N	<ul style="list-style-type: none"> • Excluded because there are limited anticipated interactions with infrastructure and services, as abandonment activities 	N/A	None	N	N/A	None	None	N/A

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		<p>have a limited scope, relatively small workforce requirements and short duration.</p> <ul style="list-style-type: none"> The temporary workforce required for the Project will be accommodated using commercial accommodations in nearby towns and cities (e.g., hotels, rental units, campgrounds). Waste disposal will be managed in accordance with the <i>Abandonment Waste Management Plan</i> (Appendix 1F of the EPP) and the TC Energy Waste and Hazardous Materials Management Manual. 							
Employment and Economy	N	<ul style="list-style-type: none"> Excluded because the Program has a limited scope, relatively small workforce (up to approximately 20 workers), and a short duration of physical abandonment activities (from 2 to 4 weeks for each PDA). Physical abandonment activities in any one area will be limited in extent and duration. Although the Program could result in employment and business opportunities, these will be limited in duration and extent. There will be a cessation or decrease in tax payments associated with pipeline and facility abandonment. NGTL will engage with Counties and Municipal Districts who may be affected. 	N/A	None	N	N/A	None	None	N/A
Rights of Indigenous Peoples	Y	<ul style="list-style-type: none"> NGTL is engaging 44 potentially affected Indigenous groups. No outstanding site-specific Program issues or concerns have been identified to date. The results of engagement are summarized in the Application. Specific potential interactions are provided below. The PDAs occur within the identified traditional territories, regional boundaries and/or areas of interest of 44 Indigenous groups, including Treaty 6, 7 and 8 First Nations, Indigenous and Métis groups. The Program Components are located on a mix of both freehold and Crown land that are currently held under disposition, lease or easement by NGTL. This assessment assumes that areas within or near the PDAs on Crown land may 	Underway	<p>Physical Abandonment Change to the implementation of Indigenous cultural traditions, laws and governance systems that inform manner in which Indigenous groups exercise their Indigenous rights, through:</p> <ul style="list-style-type: none"> Change in ability to practice cultural traditions, laws and governance systems. Change in ability to practice traditional gatherings, events and ceremonies. <p>Change in the exercise of Indigenous rights due to change in the availability, quality, quantity of and/or access to traditional resources associated with</p>	Y	<p>Physical Abandonment</p> <ul style="list-style-type: none"> Implement the standard practices and specific measures to mitigate effects on the resources relied upon for the exercise and practice of Indigenous rights that are provided in the EPP; also refer to the Traditional Land and Resources Use, Soils and Soil Productivity, Wildlife and Wildlife Habitat, Fish and Fish Habitat, Water Quality and Quantity, Air Emissions, and Human Occupancy and Resource Use elements of this table, as well as the Program's Abandoned Pipeline Monitoring Plan. The Company will develop an environmental orientation that will 	Program abandonment activities may have an effect on the implementation of Indigenous cultural traditions, laws and governance systems that inform the manner in which rights are exercised.	As residual effects on TLRU for the Program have been characterized as negligible, no cumulative effects assessment was completed.	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.</p>

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		<p>support resources or contain areas or sites that are currently used for traditional purposes.</p> <p>Interactions Based on its scope, setting and scale, the Program has the potential to interact with the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the <i>Constitution Act, 1982</i> (herein referred to as the "rights of Indigenous peoples").</p> <p>Interactions with the rights of Indigenous peoples may occur during physical abandonment activities due to:</p> <ul style="list-style-type: none"> • vegetation removal • soil stripping and grading • vehicle and equipment movement • increased noise • increased traffic <p>Interactions with the implementation and expression Indigenous group's cultural traditions, laws and governance systems that inform the manner in which they exercise their Indigenous rights may occur due to:</p> <ul style="list-style-type: none"> • short-term access restrictions and activities associated with physical abandonment <p>Interactions with the rights of Indigenous peoples during abandonment in-place are not predicted as access and ability to practice Indigenous rights will not be decreased and, in some cases, may be improved following completion the Program.</p>		<p>exercise of rights, including change to timing and/or seasonality of resources and/or activities, through:</p> <ul style="list-style-type: none"> • Alteration of traditionally used plant, wildlife or fish species. • Alteration of habitat supporting traditionally used plant, wildlife or fish species. <p>Change in the exercise of Indigenous rights due to change in current traditional use sites or areas and/or in access to these sites or areas associated with exercise of rights, including change to timing and/or seasonality of availability/suitability for activities, through:</p> <ul style="list-style-type: none"> • Alteration of currently used harvesting, habitation, and cultural or spiritual sites and areas. • Alteration of currently used trails and travelways. • Restriction on ability to wayfind to/through current use areas where rights are exercised. • Effects on air quality or water quality, or sensory disturbances that have the potential to influence the conditions for current use. 		<p>be delivered to ensure that all personnel working on Project construction are informed of Project-specific environmental requirements and sensitivities, before being allowed access to the Project site.</p> <ul style="list-style-type: none"> • Provide potentially affected Indigenous groups with the proposed Project construction schedule and maps. • If TLRU sites not previously identified are found on the construction footprint during construction, implement the Cultural Resource Discovery Contingency Plan. • Undertake ongoing engagement with potentially affected Indigenous groups to follow up on any unanticipated issues or concerns. • Enhancement measures to support, improve or provide benefit to the rights exercised by Indigenous peoples in the Project Area including those policies and procedures that encourage diversity, inclusion and fair employment, including, but not limited to the following: <ul style="list-style-type: none"> • Reasonable Workplace Accommodation Policy • Equal Employment and non-Discrimination Policy, and • Disability Management Program. • The Prime Contractor will submit an Indigenous Participation Plan to NGTL that outlines the processes that it will follow to facilitate productive opportunities for qualified and competitive local Indigenous businesses and people on the Program. 	<ul style="list-style-type: none"> • No interactions with the Program are predicted for employment and economy, including Indigenous employment and economy. <p>Potential program effects on the availability, quality, quantity of and/or access to traditional resources and in current traditional use sites or areas and/or in access to these sites or areas are discussed under Traditional Land and Resource Use. For abandonment activities, these effects will be negligible in magnitude, short term to long-term in duration, limited in spatial extent, once in frequency, local to landscape in extent, largely confined to previously disturbed and reversible; furthermore, these effects will be managed in accordance with the TLRU element of this table and the EPP.</p> <p>Program abandonment activities may have an effect on the exercise of Indigenous rights due to change in the availability, quality, quantity of and/or access to traditional resources associated with exercise of rights, including change to timing and/or seasonality of resources and/or activities. The associated residual effects of the Project are expected to be negligible in magnitude, short term in direction, once in</p>		

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							<p>frequency, local to landscape in extent, largely confined to disturbed contexts, and reversible.</p> <p>Overall, measurable residual effects on the exercise or practice of Indigenous and treaty rights are likely. If they do occur, the overall degree to which the Program may result in residual adverse effects on the exercise of practice of Indigenous and treaty rights is lessened with consideration for NGTL's commitment to mitigation and enhancement measure as well as ongoing engagement throughout abandonment.</p>		
Accidents and Malfunctions	Y	<p>Physical abandonment activities have the potential to cause:</p> <ul style="list-style-type: none"> • fire • hazardous materials release • vehicle accident • damage to existing utilities. <p>Abandonment-in-place are excluded as no further ground disturbance with the potential to cause accidents and malfunctions are anticipated.</p>	Complete	<p>Physical Abandonment</p> <ul style="list-style-type: none"> • Fire could originate from a Program work site during physical abandonment activities or occur as a result of lightning strike. • A hazardous materials release could occur during physical abandonment activities due to improper handling, use or storage. • A vehicle accident could occur during physical abandonment activities during movement of vehicles to and from the PDAs or heavy equipment on-site. • Damage to existing pipelines and/or facilities near the PDAs could occur during physical abandonment activities 	Y	<p>Physical Abandonment</p> <ul style="list-style-type: none"> • NGTL will implement the Program's Abandonment Monitoring Program Plan which contains emergency response measures as required. <p><u>Fire</u></p> <ul style="list-style-type: none"> • Ensure that personnel are made aware of the proper disposal methods for welding rods, cigarette butts and other hot or burning material. • Necessary fire-fighting equipment will be on site in accordance with the requirements of the responsible regulatory authority. • All motorized equipment must carry a fully charged fire extinguisher. The Contractor will ensure that fire extinguishers are present and fully charged and all fireline equipment is present and in working order. 	<p>Fire during physical abandonment activities could adversely affect several environmental and socio- economic elements. Fires are not expected to occur because of the preventative and response measures implemented by the Program, and by NGTL across its operations. With the implementation of the prevention and response measures, residual effects from fire on VCs are anticipated to be negligible.</p> <p>A hazardous materials release during physical abandonment activities could adversely affect several environmental and socio-economic elements. A hazardous materials</p>	As the Program residual effects from accidents and malfunctions are predicted to be negligible, a cumulative effects assessment was not conducted.	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.</p>

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						<ul style="list-style-type: none"> Ensure the Contractor has the necessary fire-fighting equipment on hand that is capable of controlling any fire that may occur as a result of their activities, as identified by provincial regulations and responsible government agencies. The fire equipment and water supply on site will be increased as the fire hazard increases. Only burn slash if permission is granted from the regulating authorities and if conditions permit. If burning is delayed, store slash on the Project footprint. All burning will be completed in accordance with the applicable regulations and permits. For activities conducted during the fire season as determined by the applicable jurisdiction, determine the Fire Danger Class for the location, and communicate it to onsite personnel on a regular basis. In the event of a fire or elevated fire hazard conditions according to applicable guidelines or regulations, follow the measures outlined in the <i>Fire Suppression Contingency Plan</i> (Appendix 1E of the EPP). Avoid locating burn piles on peat rich areas where residual fires could persist after abandonment. Burn piles will be located along trench line or on approved areas where strippings have been removed. <p><u>Hazardous Materials Release</u></p> <ul style="list-style-type: none"> All equipment shall arrive on the project free of leaks and in good working condition. Any equipment 	<p>release, if it occurs, is expected to be limited in volume and area, and can be cleaned up by onsite crews using standard equipment. With the implementation of preventative and response measures, residual effects of a hazardous material release on VCs considered in this assessment are anticipated to be negligible.</p> <p>A vehicle accident during physical abandonment activities could adversely affect several environmental and socio-economic elements. The Program will comply with applicable traffic rules and regulations and with TC Energy's policies and procedures for traffic management and emergency response. With implementation of preventative and response measures, residual effects of vehicle accidents on VCs are anticipated to be negligible.</p> <p>Damage to existing pipelines and/or facilities near the PDAs during physical abandonment activities could adversely affect several environmental and socio-economic elements. Damage to existing utilities is unlikely due to the implementation of mitigation measures such as NGTL's ground</p>		

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						<p>which does not arrive free of leaks and in good working condition shall not be allowed to perform any work until it has been repaired, re-inspected by the Environmental Inspector(s) or designate(s), and deemed suitable for use.</p> <ul style="list-style-type: none"> The Contractor will ensure equipment is monitored regularly and free of fluid leaks. In the event of a release of any size, the Contractor shall immediately report the release to the Environmental Inspector(s) or designate(s). Appropriate release prevention and response, containment and recovery equipment will be maintained at all work sites, in accordance with the <i>Chemical and Waste Management Plan</i> (Appendix 1F of the EPP). If an accidental release does occur, measures to control, contain, recover and clean up the release are to be implemented immediately to minimize the potential for adverse environmental and human health effects, or to ensure the release does not spread or increase in size. Refer to the <i>Release Contingency Plan</i> (Appendix 1E of the EPP). Bulk fuel trucks, service vehicles, and pick-up trucks equipped with box mounted fuel tanks shall carry release prevention, containment, and clean up materials that are suitable for the volume of fuels or oils carried, in accordance with the <i>Chemical and Waste Management Plan</i> (Appendix 1F of the EPP). 	<p>disturbance procedures, site planning, and the use of One-Call services. With implementation of preventative and response measures, residual effects of damage to existing facilities are anticipated to be negligible.</p> <p>Significance With the implementation of prevention and response measures, residual effects of accidents and malfunctions on the environment socio-economic elements are predicted to be not significant.</p>		

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						<ul style="list-style-type: none"> • Release contingency material carried on bulk fuel and service vehicles, or in environmental response units shall be suitable for use on land and water. • Ensure pumps, generators, light towers, frost fighters, hand-held fuel containers used within 100 m of a water body have secondary containment that can hold 125% of the fuel tank. This applies to secondary containments that are constructed on site. Where equipment includes double-walled, Enviro-tank-style design, the minimum requirement shall be 110% of the fuel tank. • All fuel tanks, hazardous materials and chemicals shall be stored within appropriate secondary containment per requirements outlined in the <i>Chemical and Waste Management Plan</i> (Appendix 1F of the EPP). • Do not allow fuel, oil, or hazardous material storage within 100 m of a watercourse or waterbody except where secondary containment is provided. The Contractor will collect all Project debris and other waste materials and dispose of daily at an approved facility and in accordance with the <i>Chemical and Waste Management Plan</i> (Appendix 1F of the EPP) and the <i>Release Contingency Plan</i> (Appendix 1E of the EPP) unless otherwise authorized by the Environmental Inspector(s). • Contact the Company's Canadian Regulatory Compliance team within 2 hours of a release of any chemical or physical substance at a concentration or volume 			

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						<p>sufficient to cause or potentially cause an irreversible, long-term, or continuous change to the ambient environment in a manner that causes harm to human life, wildlife, or vegetation.</p> <p><u>Vehicle Accident</u></p> <ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. For other access measures and guidelines on the Project footprint and associated access roads, refer to the <i>Traffic Control Management Plan</i> (Appendix 1F of the EPP). <p><u>Damage to Existing Utilities</u></p> <ul style="list-style-type: none"> To prevent inadvertent trespass, stake the approved Project footprint to clearly delineate all boundaries. Mark and locate all foreign lines and cables using One-Call services before the start of abandonment activities. Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. 			
Effects of the Environment on the Project	Y	Interactions could occur due to extreme weather events, wildfires, large geohazards. Abandonment-in-place is excluded as no above-ground infrastructure will remain with the potential to interact with extreme weather events, wildfires, large geohazards. Environmental effects on buried infrastructure (i.e., pipeline abandoned in place), such as potential ground subsidence events, is unlikely (see Soil and Soil Productivity element in this table) and inconsequential because will not be operating.	Complete	<p>Physical Abandonment Effects of the Environment on the Project may arise during physical abandonment activities due to:</p> <ul style="list-style-type: none"> Wildfires Extreme Weather Events Large-scale Geohazards 	Y	<p>Physical Abandonment <u>Wildfires</u></p> <ul style="list-style-type: none"> In the event of a fire or elevated fire hazard conditions according to applicable guidelines or regulations, follow the measures outlined in the <i>Fire Suppression Contingency Plan</i> (Appendix 1E of the EPP). Necessary fire-fighting equipment will be on site in accordance with 	With the implementation of mitigation, preventative and response measures, residual adverse effects of the environment on the Program are not anticipated.	None	<p>Environmental inspection will occur during physical abandonment activities. Post-abandonment monitoring will follow the Program's Reclamation Monitoring Plan.</p> <p>Additionally, NGTL will continue to monitor the abandoned in-place</p>

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						<p>the requirements of the responsible regulatory authority.</p> <ul style="list-style-type: none"> All motorized equipment must carry a fully charged fire extinguisher. The Contractor will ensure that fire extinguishers are present and fully charged and all fireline equipment is present and in working order. The fire equipment and water supply on site will be increased as the fire hazard increases. Ensure the Contractor has the necessary fire-fighting equipment on hand that is capable of controlling any fire that may occur as a result of their activities, as identified by provincial regulations and responsible government agencies. Ensure that personnel are made aware of the proper disposal methods for welding rods, cigarette butts and other hot or burning material. <p><u>Extreme Weather Events</u></p> <ul style="list-style-type: none"> In the event of adverse weather that could result in rutting, sedimentation and erosion, and/or compaction, the Environmental Inspector(s) or designate(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the <i>Adverse Weather Contingency Plan</i> (Appendix 1E of the EPP). A soils specialist and/or the responsible regulatory agency may be consulted, if warranted. Following an adverse weather event, confirm the efficacy of sediment and erosion control measures and whether corrective action is required. 			pipelines for potential hazards according to the Program's Abandoned Pipeline Monitoring Plan.

Element	Interaction (Y/N)	Description of Interaction(s) (If no interaction is predicted, provide justification)	Status of Element-Specific Study or Survey (Complete, Underway, Date Expected, or N/A)	Description of Potential Effects	Mitigation Will be Implemented to Resolve Potential Adverse Effects (Y/N)	Specify the Mitigation	Description of Residual Effects after Mitigation	Description of Cumulative Effects	Monitoring Plan/Details
						<ul style="list-style-type: none"> If wet/thawed soil conditions occur, implement the <i>Wet Soil Contingency Plan</i> (Appendix 1E of the EPP). Postpone replacement of topsoil/strippings during wet weather or high winds to prevent erosion and/or damage to the soil structure. <p><u>Large Scale Geohazards</u></p> <ul style="list-style-type: none"> In the case where imminent hazards or danger are experienced during abandonment activities, employ the Company Emergency Response Plan. Work will be immediately stopped, personnel will ensure personal safety, and supervision will be informed. The affected area(s) of the worksite will be closed, and work may only continue after the hazard has been deemed safe by the Project Management Team, and the necessary plans or procedures to address the hazard/danger have been approved for execution. All personnel on the worksite have the obligation to stop or refuse unsafe work if it presents an imminent hazard/danger. 			

Other (please specify) N/A

NOTE: NGTL confirms that all the standard environmental mitigation noted in the above table as well as the following contingency and management plans are included in a Program-specific Environmental Protection Plan (EPP): *Release Contingency Plan; Adverse Weather Contingency Plan; Flood and Excessive Flow Contingency Plan; Wet Soils Contingency Plan; Fire Suppression Contingency Plan; Soil Handling Contingency Plan; Permafrost Contingency Plan; Soil Erosion Contingency Plan; Contaminated Soils Contingency Plan; Drilling Mud Release Contingency Plan; Plant Species and Ecological Communities of Concern Discovery Contingency Plan; Wildlife Species of Concern Discovery Contingency Plan; Cultural Resource Discovery Contingency Plan; Chemical and Waste Management Plan; Traffic Control Management Plan; Hydrovac Slurry Handling Management Plan; Trenchless Crossing Management Plan; Breeding Bird and Nest Management Plan; and Access Management Plan.*

- Physical Abandonment Activities for the 2022 Abandonment Program include the following: purging the laterals of gas and cleaning the pipes; isolating lateral pipelines from customer connections and the NGTL System; cutting the pipes and capping/installing blind flanges at isolation points; removing above-ground infrastructure at 21 meter stations and 7 producer tie-ins; removing above-ground facilities associated with the laterals, including above-ground valves where necessary; and, removing 57 cathodic protection facilities and abandoning in place 23 lateral sections are being abandoned, with 0.51 km removed and 153.45 km abandoned in place.
- Surface strippings are defined as the organic layer(s) overlying the mineral soil on forested (Green Area) lands and may include a portion of the upper mineral soil depending on the depth of the organic layer and conditions at the time of stripping.

Source:
PASC (Pipeline Abandonment Steering Committee). 1996. Pipeline Abandonment – A Discussion Paper on Technical and Environmental Issues. Available at: https://www.cer-rec.gc.ca/en/applications-hearings/pipeline-abandonment/pipeline-abandonment-discussion-paper-technical-environmental-issues.html#s3_3. Accessed March 2023.

Revised Attachment 8:
Environmental Protection Plan

ENVIRONMENTAL PROTECTION PLAN FOR THE PROPOSED 2022 ABANDONMENT PROGRAM

Rev 02
October 2023

Prepared for:



NOVA Gas Transmission Ltd.,
A Wholly Owned Subsidiary of TC Energy
Calgary, Alberta, Canada

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1.0 INTRODUCTION

This Environmental Protection Plan (EPP) outlines environmental protection measures to avoid or reduce potential adverse effects during physical abandonment activities that will be completed as part of the 2022 Abandonment Program (the Project), proposed by NOVA Gas Transmission Ltd. (NGTL, or the Company), an affiliate of TC Energy Corporation (TC Energy). The 2022 Abandonment Program (the Program) consists of the abandonment of meter stations (MS), lateral pipelines and associated producer tie-ins (PTI) and cathodic protection (CP) facilities, all of which are part of the NGTL System in Alberta. The Program involves abandoning the facilities either by removal or by abandonment in-place, with the abandonment method selected considering site-specific factors, such as land use, and input received from potentially affected landowners, stakeholders and Indigenous groups, refer to Table 1 for specific program details. The Program includes the following:

- Isolation of the Facilities from the NGTL System;
- Cutting, filling and capping a lateral pipeline under four provincial paved highways, one paved county road, and two railway crossings;
- Removal of above-ground and below-ground infrastructure at 23 meter station sites;
- Removal of above-ground facilities associated with the lateral pipelines, including above-ground valves where necessary;
- Removal of 0.51 km of lateral pipelines including one PTI;
- Abandonment in-place of 153.45 km of lateral pipelines over 23 lateral pipeline sections, including six PTIs;
- Removal of CP systems, including test stations associated with the meter stations and lateral pipelines, and related infrastructure.

Physical abandonment activities will take place within the existing rights-of-way (ROWs) and facility site boundaries. Access to physical abandonment activity locations will use existing roads, trails, utility ROWs and NGTL ROWs where possible. At this time, not all access has been determined. When access plans have been confirmed, NGTL will conduct a desktop review and field studies, if necessary, apply any necessary mitigation measures as detailed in this EPP, and obtain any necessary permits or authorizations prior to Program activities.

The laterals will be physically isolated from the NGTL System at the start and end point of the segment of pipeline being abandoned, and at side valves and PTIs. The Bruce Lateral, a portion of Bigstone Lateral, Louisiana Lake MS PTI, a portion of Louisiana Lake Lateral Loop, will be removed. The AECO C Lateral, Bruce North MS PTI, Bruce North Lateral, Josephine MS PTI, Lennard Creek Lateral, Minburn Lateral, Osborne Lake Lateral, Pioneer East Lateral, Pioneer East Lateral Loop, Ranfurly Receipt MS PTI, Rochester Lateral, Scotfield Lateral, Silver Valley Lateral, Simonette MS PTI, Tide Lake MS PTI, Tide Lake North Lateral, Tillebrook MS PTI, Ukalta Lateral, Ukalta Lateral Loop, Viking North Lateral, Weasel Creek Lateral, and Whitford Lateral, as well as the remaining segments of Bigstone Lateral and Louisiana Lake Lateral Loop, will be abandoned in-place.

Remediation or risk management of identified soil and groundwater contamination, as required, will be undertaken during the 2022 Abandonment Program. Where soil disturbance is required, disturbed areas will be reclaimed to equivalent land capability. The 2022 Abandonment Program will comply with all applicable codes, standards, regulations, and approval conditions.

The EPP is written in construction specification format and should be read in conjunction with Project-specific environmental documents. This EPP provides Project-related environmental protection measures and commitments to be considered during the detailed engineering design, and implemented during the abandonment, reclamation and reclamation monitoring phases of the Project.

The EPP is based on:

- TC Energy's Operational Management System;
- TC Energy's Health, Safety and Environment (HSE) Commitment;
- feedback obtained through consultation and ongoing engagement;
- results of desktop studies;
- commitments made in Project-specific environmental documents (e.g., ESA, permits and approvals); and
- professional experience.

Revisions to the EPP may occur as a result of:

- results of supplemental studies;
- commitments made during the regulatory review process including information requests (IRs);
- regulatory approval conditions; and
- ongoing engagement with stakeholders (e.g., municipalities; regulators), landowners and/or Indigenous groups.

Subject to regulatory approval, physical abandonment activities are scheduled to take place between Q3 2024 and Q4 2025. Physical work at each work site will take approximately 14 to 28 days for most sites. Clean-up and reclamation of disturbed portions of the Project footprint will be conducted immediately following activity completion, or as soon as weather, ground or seasonal conditions allow.

2.0 PURPOSE

The purpose of the EPP is to describe the environmental protection measures and commitments to be carried out by the Company, its Contractor(s) and subcontractor(s) (Hereafter, Contractor(s)) during abandonment activities for the Project to avoid or reduce potential adverse environmental effects of the Project. The EPP includes both general and project-specific environmental protection measures which have been developed and refined over time based on past project experience, input from stakeholders (e.g., municipalities, regulators), landowners and Indigenous groups during consultation, and reflect current industry best management practices where they are applicable to Project activities.

Specifically, the EPP serves as reference information to Project personnel to support decision making and provides references to more detailed information and will also be used as a guide for identifying and implementing environmental protection measures during the Project abandonment phase.

3.0 ENVIRONMENTAL PROTECTION PLAN ORGANIZATION

This section provides an overview of the organization of the EPP.

3.1 Organization

This EPP provides Project-related environmental protection measures and commitments to be carried out during abandonment activities for the Project. A large portion of environmental protection measures are standard practice for all TC Energy projects. Additional Project-specific environmental protection measures are identified in Section 7.0 of the EPP.

The EPP applies to the approved Project footprint. The Project footprint may include but is not limited to a pipeline ROW, temporary workspace, permanent and temporary access roads, staging areas, facility sites, construction yards, office site, and pipe and/or equipment storage areas. If there are lease agreements in place for some Project areas, then there may also be conditions in those lease agreements that will also apply to those specific areas.

Environmental protection measures are identified under the headings below in accordance with the typical progression of abandonment activities and are intended to be read in conjunction with the Environmental Alignment Sheets or Environmental Figures, where applicable. The Environmental Alignment Sheets and Environmental Figures identify specific locations where environmental protection measures will be applied.

The EPP is intended to provide the Company and its Contractor and subcontractor(s) personnel with an understanding of the general environmental setting of the Project, extent and limitations of the EPP, specific or unique mitigation measures for the Project, and general environmental protection measures or industry best management practices that are typically applied to each abandonment activity in sequence.

Sections 1 to 3 outline the purpose and organization of the EPP, summarize the environmental setting and context with respect to geographic location, and identify where information can be found in the EPP.

Section 4 "Environmental Compliance" provides information about the tools and process to facilitate compliance with all regulatory approvals, permits, commitments and specific requirements of the EPP.

Section 5 "Notification" provides details on specific activities to be followed for notification of Project activities to relevant stakeholders, landowners and Indigenous groups before commencing abandonment activities.

Section 6 "Pre-Abandonment Measures" outlines activities to clearly delineate the boundaries of approved work areas and to ensure environmentally sensitive features are properly identified prior to any ground disturbance. Proper identification avoids potential impacts to resource features and ensures that the Company and its Contractor(s) are aware of the limits of the approved work areas.

Section 7 "Project-Specific Environmental Protection Measures" outlines procedures to be undertaken to protect environmental and cultural features that were identified pursuant to the environmental assessment or that are unique to the Project. Information in Section 7 is documented and displayed on the Environmental Alignment Sheets or Environmental Figures, where applicable.

Section 8 "Meter Station and Pipeline Abandonment" outlines the environmental protection measures associated with general meter station and pipeline abandonment activities, ROW and access preparation, areas of potential environmental concern and topsoil handling, strippings salvage, grading, water crossings, excavation, pipeline and facility removal activities, cutting, capping, welding, backfill, and clean-up and reclamation activities that will be executed.

Section 9 "Reclamation and Reclamation Monitoring" outlines activities to take place once physical abandonment and reclamation activities have been completed to evaluate the success of reclamation activities, compliance with commitments and the stability of the disturbed lands.

Appendices to the EPP include drawings, Project contacts, contingency plans and management plans to support the specific environmental protection measures identified in the EPP and provide guidance to decision making processes should conditions arise that require implementation of contingency measures.

3.2 Environmental Setting

The program components are located throughout Alberta, within seven Natural Subregions: Central Mixedwood, Central Parkland, Dry Mixedgrass, Dry Mixedwood, Lower Boreal Highlands, Lower Foothills, Mixed Grass. The landscapes where the program components are located have been previously altered by anthropogenic disturbance including forestry, agriculture, oil and gas, power and transportation. Program activities will largely take place on previously disturbed land that is held under disposition, lease or easement by NGTL.

Multiple Project Development Areas (PDAs) are defined for the purposes of the effects assessment for this Program. Each PDA comprises an area of excavation and/or facility removal and associated workspace (i.e., required for vehicle and equipment movement, and storage of soil and materials during physical abandonment activities). The total area covered by all 115 PDAs is approximately 20.01 ha.

Portions of some PDAs are within areas of potential native grassland and wetland communities. One listed plant species of conservation concern, dwarf woollyheads (*Psilocarphus brevissimus* var. *brevissimus*) ranked S2 by ACIMS and is a species of concern under Schedule 1 of the *Species at Risk Act* (SARA) was identified within two PDAs. One threatened plant species at risk, Slender Mouse-Ear Cress (*Halimolobos virgata*) ranked S2 by ACIMS and is threatened species under Schedule 1 of the SARA occurs within the PDAs of 12 sites.

Based on a review of species ranges, there is the potential for 81 species at risk and species of management concern to occur within the wildlife regional study area, comprising of 30 bird species, twelve mammal species, four amphibian species, four reptiles, and five arthropods. Environmental constraints that apply to the physical abandonment activities include breeding bird nesting, woodland caribou (Boreal Population) ranges, secondary grizzly bear support zones, sharp-tailed grouse range, burrowing owl range, sensitive raptor range, sensitive amphibian range, watercourses, wetlands, key wildlife biodiversity zone and native grassland. These provincially identified wildlife ranges have associated timing windows and setbacks for industrial disturbances.

The Program includes physical activities at ~~eight isolation points~~ and one CP site within 30 meters of a watercourse or waterbody (see Table 3). There is no planned instream works associated with the Program aside from temporary crossing of watercourses. An isolation point associated with the Pioneer East Lateral is located within 30 m of Carrot Creek, known to contain rainbow trout. The Athabasca River population of rainbow trout is listed as “endangered” on Schedule 1 of SARA, as well as by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Provincially, under the *Alberta Wildlife Act*, the population is considered “at risk”. Carrot Creek is also known to contain two fish species provincially listed as “may be at risk”, arctic grayling and spoonhead sculpin. A CP site associated with the Silver Valley Lateral is within 30 m of Sneddon Creek, known to contain largescale sucker, provincially listed as “sensitive”.

TABLE 1 2022 ABANDONMENT PROGRAM COMPONENTS

Program Component	Meter Station Legal Description	Lateral					Municipal District
		Approximate Length (km)	Nominal Pipe Size (NPS)	Start Point Legal Description	End Point Legal Description	Abandonment Method	
Meter Stations with Associated Pipeline(s)							
Bruce RMS and Bruce Lateral	SW 06-047-15 W4M	0.12	8	SE 06-047-15 W4M	SW 06-047-15 W4M	Remove	Beaver County
Bruce North RMS, Bruce North MS PTI, and Bruce North Lateral	SE-30-094-16 W5M	1.24	4	SW 01-048-15 W4M	NE 01-048-15 W4M	In-place	Beaver County
		5.70	4	SE 05-048-15 W4M	SW 01-048-15 W4M	In-place	
Josephine RMS and Josephine MS PTI	NW 36-082-10 W6M	1.17	10	NW 36-082-10 W6M	NE 01-083-10 W6M	In-place	Saddle Hills County
Lennard Creek RMS and Lennard Creek Lateral	NW 23-107-06 W6M	8.80	6	NE 14-108-06 W6M	NW 23-107-06 W6M	In-place	Mackenzie County
Louisiana Lake RMS, Louisiana Lake MS PTI, Louisiana Lake Lateral, and Louisiana Lake Lateral Loop	SW 03-018-11 W4M	0.06	6	SE 04-018-11 W4M	SW 03-018-11 W4M	Remove	Cypress County, County of Newall No. 4
		11.70	6	SW 02-018-10 W4M	SW 03-018-11 W4M	In-place / Remove	
		11.70	4	SW 02-018-10 W4M	SW 03-018-11 W4M	In-place	
Minburn RMS and Minburn Lateral	SE 24-051-10 W4M	9.30	4	NE 24-050-10 W4M	SE 24-051-10 W4M	In-place	County of Minburn No. 27
Osborne Lake RMS and Osborne Lake Lateral	NE 01-064-07 W4M	7.37	6	SW 05-064-07 W4M	NE 01-064-07 W4M	In-place	M.D. of Bonnyville No. 87
Pioneer East RMS, Pioneer East Lateral, and Pioneer East Lateral Loop	NE 16-055-13 W5M	10.38	4	SW 26-054-14 W5M	NE 16-055-13 W5M	In-place	Yellowhead County
		10.38	8	SW 26-054-14 W5M	NE 16-055-13 W5M	In-place	
Ranfurly RMS and Ranfurly MS PTI	SE 28-050-09 W4M	0.41	12	SW 27-050-09 W4M	SE 28-050-09 W4M	In-place	County of Minburn No. 27
Rochester RMS and Rochester Lateral	NE 27-062-24 W4M	6.11	4	SW 09-062-24 W4M	NE 27-062-24 W4M	In-place	Athabasca County
Scotfield RMS and Scotfield Lateral	NW 16-030-10 W4M	1.06	4	SW 21-030-10 W4M	NW 16-030-10 W4M	In-place	Special Areas Board Area No. 2
Silver Valley Sales and Silver Valley Lateral	NE 22-081-11 W6M	16.50	6	NW 20-081-09 W6M	NE 22-081-11 W6M	In-place	Saddle Hills County

TABLE 1 2022 ABANDONMENT PROGRAM COMPONENTS

Program Component	Meter Station Legal Description	Lateral					Municipal District
		Approximate Length (km)	Nominal Pipe Size (NPS)	Start Point Legal Description	End Point Legal Description	Abandonment Method	
Ukalta RMS and Ukalta Lateral	SE 25-057-17 W4M	10.30	6	NW 31-057-15 W4M	SE 25-057-17 W4M	In-place	Lamont County
Ukalta East RMS and Ukalta Lateral Loop	NE 35-057-16 W4M	2.66	6	NW 31-057-15 W4M	NE 35-057-16 W4M	In-place	Lamont County
Viking North RMS and Wiking North Lateral	NW 31-049-13 W4M	6.18	4	SE 04-050-13 W4M	SW 36-049-14 W4M	In-place	Beaver County
Weasel Creek RMS and Weasel Creek Lateral	NW 06-060-19 W4M	2.97	4	NW 30-059-19 W4M	NW 06-060-19 W4M	In-place	Smoky Lake County
Whitford RMS and Whitford Lateral	SE 20-056-15 W4M	2.03	6	SW/NW 22-056-15 W4M	SE 20-056-15 W4M	In-place	County of Two Hills No. 21
Stand-alone Pipelines							
AECO C Lateral	--	6.78	8	SE 02-019-10 W4M	SW 03-019-09 W4M	In-place	Cypress County
AECO C Lateral Loop (heavier wall)	--	2.56	12	SE 02-019-09 W4M	SW 05-019-09 W4M	In-place / Remove	Cypress County
AECO C Lateral Loop (light wall)	--	4.26	12	SW 05-019-09 W4M	SE 04-019-10 W4M		Cypress County
Bigstone Lateral	--	11.63	12	NW 14-061-19 W5M	SW 15-061-20 W5M	In-place	M.D. of Greenview No. 16
Bigstone Lateral	--	0.29	12	SE 10-061-22 W5M	SE 10-061-22 W5M	Remove	M.D. of Greenview No. 16
Tide Lake North Lateral	--	0.64	6	SE 26-019-10 W4M	NW 23-019-10 W4M	In-place	Cypress County
Stand-alone Meter Stations							
Bailey's Bottom RMS	SE 21-007-22 W4M	--	--	--	--	--	Cardston County
Kehiwin RMS	SE 25-059-07 W4M	--	--	--	--	--	M.D. of Bonnyville No. 87
Kemp River RMS	SE 28-102-03 W6M	--	--	--	--	--	Northern Lights County
Maddenville RMS	SE 15-063-25 W5M	--	--	--	--	--	M.D. of Greenview No. 16

TABLE 1 2022 ABANDONMENT PROGRAM COMPONENTS

Program Component	Meter Station Legal Description	Lateral					Municipal District
		Approximate Length (km)	Nominal Pipe Size (NPS)	Start Point Legal Description	End Point Legal Description	Abandonment Method	
Sedgewick East Receipt	NW 23-043-11 W4M	--	--	--	--	--	Flagstaff County
Stand-alone PTIs							
Simonette MS PTI	--	0.33	8	NE 06-063-25 W5M	NW 05-063-25 W5M	In-place	M.D. of Greenview No. 16
Tide Lake MS PTI	--	0.69	4	NE 10-018-10 W4M	SW 14-018-10 W4M	In-place	Cypress County
Tilliebrook M/S PTI	--	0.58	6	NW 20-018-13 W4M	NE 20-018-13 W4M	In-place	County of Newell No. 4

3.3 Extent and Limits of the EPP

Contents of the EPP apply to abandonment activities and post-abandonment reclamation activities occurring under non-frozen and frozen ground conditions. There may be a need to revise or refine specific measures as a result of on-going consultation with stakeholders (e.g., municipalities, regulators), landowners and Indigenous groups, or to address unforeseen site-specific conditions that may arise during abandonment. If this were to occur, the Company will resolve the issue with the appropriate construction and environmental personnel, in consultation with the responsible regulators, as required.

The Company confirms assurance of its commitment to taking responsibility for potential environmental effects of the Project through informed environmental planning, assessment, mitigation and reclamation. Indefinite terms may be included in some environmental protection measures in order to provide flexibility needed during abandonment and reclamation phases to accommodate unique situational circumstances where general environmental protection measures must be refined or site-specific environmental protection measures applied as part of the adaptive management process.

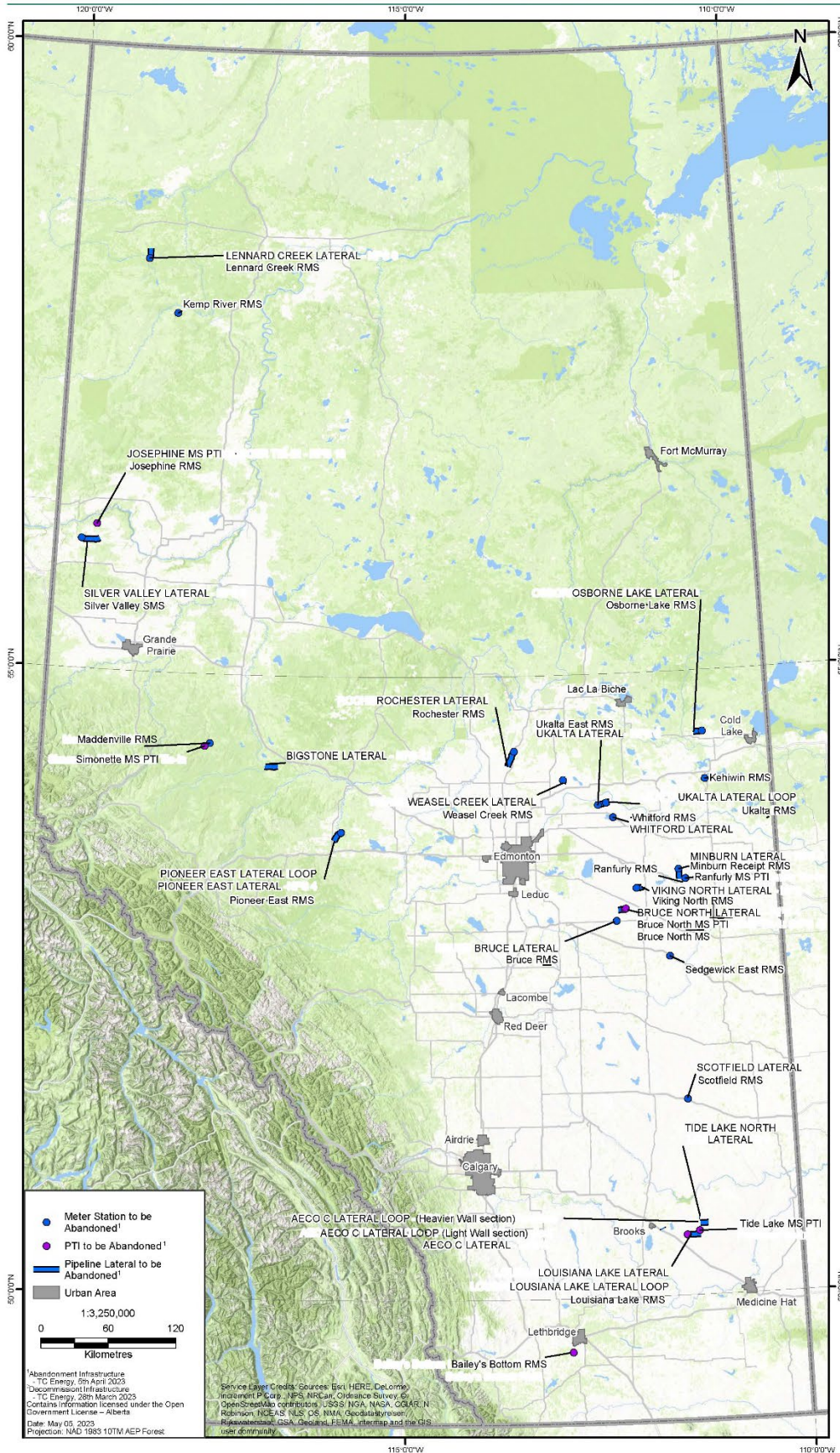


Figure 1: Program Location

4.0 ENVIRONMENTAL COMPLIANCE

Introduction

Environmental compliance is facilitated through sharing of information, providing orientations/training, hiring qualified personnel and providing onsite inspection of activities through a proactive and adaptive inspection program.

Objectives

The objectives of these environmental protection measures are to ensure that:

- The Company, its authorized representatives, Contractor(s) are aware of relevant environmental regulatory requirements;
- processes are in place that allow the Company, its authorized representatives, and Contractor(s) to access Project environmental information to aid in decision making at the field level;
- processes are in place that allow the Company, its authorized representatives, and Contractor(s) to document deficiencies found during inspection and monitoring, in order to ensure corrective and preventative actions are addressed in a timely manner; and,
- Environmental Inspector(s) or designate(s) assigned to the Project are qualified and properly trained.

Activity	Preparation Measures
<i>Approvals</i>	<ol style="list-style-type: none"> 1. The Company will ensure all necessary licenses and approvals are acquired before the commencement of abandonment activities and final clean-up. The Company, its authorized representatives, and Contractor(s) will comply with all conditions as presented to the Company on permits, approvals, licences, certificates and orders. Resolve any inconsistencies between permit conditions and contract documents as they arise.
<i>Information Sharing</i>	<ol style="list-style-type: none"> 2. The Environmental Inspector(s) or designate(s) and the Environmental Advisor will facilitate the transfer of environmental information and updates to all Company field personnel and the Contractor in a timely manner. 3. Maintain a complete set of Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents at the Project site.
<i>EPP and Distribution</i>	<ol style="list-style-type: none"> 4. Provide controlled copies of the EPP and associated environmental documents to key Project construction personnel and the Contractor prior to the start of abandonment activities. 5. The EPP serves as the guide for managing potential environmental issues and commitments during abandonment activities and includes all pertinent environmental information from the ESA and/or other Project-specific environmental documents.

Activity	Preparation Measures
<i>Project-Specific Environmental Documents and Pre-Abandonment Surveys</i>	<p>6. The Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents provide information regarding environmental requirements and serve as detail to the Construction Alignment Sheets and/or other Project-specific documents.</p> <p>7. Provide all key Contractor and Project personnel with relevant results of pre-disturbance surveys to identify known locations of environmentally sensitive features. Indicate specific environmental protection measures for these sites on the Environmental Alignment Sheets, Environmental Figures or Project-specific environmental documents and corresponding tables (e.g., Project-specific mitigation measures) and/or record GPS locations for post-abandonment monitoring requirements.</p>
<i>Landowner Line List</i>	<p>8. Review landowner requests as they appear on the landowner line list, or as they arise in the field to ensure conformance with the environmental commitments.</p>
<i>Regulations, Guidelines, and Industry Best Practices</i>	<p>9. Legislation, guidelines, and industry best practices have been considered in the creation of this EPP. Refer to the list of Regulations, Guidelines, and Industry Best Practices (Appendix 1G).</p>
<i>Environmental Inspector(s) or Designate(s) Qualifications</i>	<p>10. The Environmental Inspector(s) or designate(s) hired for the Project are required to have experience in environmental inspection and/or planning. The Environmental Inspector(s) or designate(s) will have an understanding of facility and pipeline abandonment techniques and will take a proactive approach to environmental issues. In addition, the Environmental Inspector(s) or designate(s) will be supported by appropriate Environmental Resource Specialists who have expertise in the particular issues associated with the Project and who will be available onsite or consulted, as required.</p>
<i>Environmental Inspection Responsibilities</i>	<p>11. The Environmental Inspector(s)' or designate(s)' main responsibility is to ensure that all environmental commitments, undertakings and approval conditions are met and that work is completed in compliance with applicable environmental legislation and Company policies, procedures and specifications in the most efficient and effective way possible.</p> <p>12. Environmental issues and hazards will be identified by the Environmental Inspector(s) or designate(s) and documented in daily reports. Contractor(s) will also be expected to identify potential environmental issues and hazards on an ongoing basis.</p>

Activity	Preparation Measures
<i>Environmental Inspection Responsibilities (cont'd)</i>	<p>13. Other responsibilities of the Environmental Inspector(s) or designate(s) include:</p> <ul style="list-style-type: none"> • providing expert advice and guidance on decisions or courses of action to deal with environmental conditions and issues; • supporting release reporting in accordance with federal and/or provincial legislation and advising Company management on the clean-up and disposal of the material and any affected soils or vegetation; • monitoring delivery of environmental orientation presentations to the Company, regulatory, and Contractor personnel, as directed by the Construction Manager and the Environmental Advisor; • preparing daily reports; • preparing, collecting, organizing, and disseminating all environmentally related information and documentation that arises during abandonment activities; • liaising with responsible government agencies; • supervising the Environmental Resource Specialists that may be required to support the Project; • organizing onsite meetings as the need arises, to address site-specific issues; • participating in discussions with stakeholders (e.g., municipalities; regulators), landowners and Indigenous groups, as requested; • reviewing methodologies with the Project team; and • collecting environmental information throughout the Project activities for documentation and Project reporting.
<i>Project Training and Orientation</i>	<p>14. Hire the Environmental Inspector(s) or designate(s) before the commencement of abandonment activities with sufficient lead time to enable training and participation in the orientation of the Company and Contractor personnel, as well as sufficient on-site time to facilitate review of environmentally sensitive aspects of the Project.</p> <p>15. The Environmental Inspector(s) or designate(s) will be briefed by the Environmental Advisor on the environmentally sensitive aspects of the Project, and the environmental processes and approvals that have taken place to date.</p> <p>16. The Environmental Inspector(s) or designate(s) will review all relevant Project-related information.</p> <p>17. The Company will develop an environmental orientation that will be delivered to ensure that all personnel working on the Project are informed of Project-specific environmental requirements and sensitivities, before being allowed access to the Project site.</p> <p>18. The Company will ensure the environmental orientation is provided to the Contractor. The Contractor will present the environmental orientation to all Project personnel. The Contractor will keep a log of all personnel that have received the environmental orientation and will provide to the Company upon request.</p>

Activity	Preparation Measures
<i>Non-Compliances and Resolution</i>	<p>19. The Environmental Inspector(s) or designate(s) will be notified by the responsible person onsite when a non-compliance is identified and it will be his/her responsibility to contact the Construction Manager. If the Construction Manager is not available during a non-compliance situation, the Environmental Inspector(s) or designate(s) have the authority to modify work procedures, refine environmental protection measures, or initiate work stoppage.</p> <p>20. The Construction Manager will make a determination to either modify the work procedure or shut the activity down until corrective actions are determined and implemented. The Environmental Inspector(s) or designate(s) will provide input to this decision-making process.</p> <p>21. If the work is shut down, it will resume only when corrective actions have been developed and approved by the Company. Once approved by the Company, the Contractor will inform the work crew and work will proceed following the corrective action plan.</p> <p>22. The Environmental Inspector(s) or designate(s) are responsible for documenting all procedure modifications, refinements to environmental protection measures, and environmental deficiencies and non-compliances.</p>

Change and Issue Management

During the course of abandonment activities, it may be necessary to modify or create new procedures to address site conditions not anticipated in the EPP. This procedure outlines the process to be followed.

Activity	Preparation Measures
<i>Hazard Identification</i>	<p>23. The Environmental Inspector(s) or designate(s) will monitor site conditions to identify any unanticipated environmental hazards or issues.</p> <p>24. Where environmental hazards or issues are identified, analysis will be necessary to determine the form of adaptive management that may be required. The development of new plans or procedures or the modification of existing plans and procedures will be carried out by the Environmental Advisor, the Environmental Inspector(s) or designate(s), along with any necessary Environmental Resource Specialist(s).</p> <p>25. In the case where imminent hazards or danger are experienced during abandonment activities, employ the Project-specific Emergency Response Plan. Work will be immediately stopped, personnel will ensure personal safety, and supervision will be informed. The affected area(s) of the worksite will be closed and work may only continue after the hazard has been deemed safe by the Project Management Team, and the necessary plans or procedures to address the hazard/danger have been approved for execution. All personnel on the worksite have the obligation to stop or refuse unsafe work if it presents an imminent hazard/danger.</p>
<i>Modifications</i>	<p>26. Contact the Environmental Inspector(s) or designate(s) if abnormal events or site conditions warrant a change in work procedure that may have environmental implications.</p> <p>27. The Environmental Advisor is accountable to develop the modification to the work procedure or contingency plan in co-operation with the Construction Manager, Environmental Inspector(s) or designate(s), and the Company's Project Management Team.</p>

Activity	Preparation Measures
<i>Modifications (cont'd)</i>	<p>28. The development of new plans or procedures, or the modification of existing plans and procedures, may include the following:</p> <ul style="list-style-type: none">• description of the issue;• location;• rationale;• environmental objectives;• equivalent or approved standard environmental protection measures;• refinements to existing or additional environmental protection measures required;• monitoring and reporting;• site sketch or photo documentation where applicable; and• documented sign-off by the Construction Manager, Environmental Inspector(s) or designate(s), Environmental Advisor and Project Manager. <p>29. If the modification or new plan or procedure meets environmental objectives, and there is no specific regulatory licence or approval required to implement the modification, no additional discussions with regulatory agencies are necessary.</p> <p>30. Modifications or new plans or procedures that are a variance from Project approval conditions will be discussed with the Regulator, and approval will be obtained, if required.</p> <p>31. The Environmental Inspector(s) or designate(s) are responsible for documenting all procedure modifications and refinements to environmental protection measures and communicating the changes, for sign-off, to the Construction Manager, Environmental Advisor and/or Project Manager.</p>
<i>Issue Resolution and Escalation</i>	<p>32. Environmental issues or inquiries that arise will be reviewed and resolved by the Environmental Inspector(s) or designate(s) following consultation with construction personnel, and when additional expertise is required, the Environmental Resource Specialist (e.g., soils specialist, wildlife biologist, archaeologist). If escalation is required for resolution, the Environmental Inspector(s) or designate(s) will review the issue and consult with the Construction Manager to consider potential options and impacts to other aspects of the Project prior to making a decision.</p> <p>33. Should issues arise that cannot be resolved at the field level, the Construction Manager and Environmental Inspector(s) or designate(s) will consult with the Project Manager and the Environmental Advisor to fully consider potential options and impacts to other aspects of the Project prior to making a decision.</p> <p>34. Project commitments related to environmental compliance will not be compromised as a result of the issue resolution. Final decision-making authority and accountability remains with the Project Manager.</p>

5.0 NOTIFICATION

Introduction

Notification of the abandonment schedule and timing of specific abandonment activities will facilitate awareness of upcoming activities, and allow stakeholders (e.g., municipalities, regulators), landowners and Indigenous groups to plan as appropriate for abandonment work in Project area.

Objectives

The objectives of these environmental protection measures are to ensure:

- interruptions to other land use activities are avoided or reduced during the abandonment activities;
- stakeholders (e.g., municipalities, regulators), landowners, and Indigenous groups are aware of Project activities; and
- communication is maintained with relevant regulatory agencies throughout abandonment activities.

Contacts	Measures
<i>Federal, Provincial and Municipal Agencies</i>	1. Inform all responsible federal and provincial resource agencies and interested municipal officials of the Project activities as warranted.
<i>Landowners and Lessees</i>	2. Notify potentially affected landowners, lessees and nearby residents of the intended Project schedule before the start of abandonment activities to avoid or reduce impacts to their operations or activities.
<i>Potentially Affected Indigenous Groups</i>	3. Provide potentially affected Indigenous groups with the proposed abandonment activities schedule and maps.
<i>Trappers</i>	4. Notify registered trappers at least 10 days prior to abandonment activities.

6.0 PHYSICAL ABANDONMENT PREPARATION

Introduction

The following measures will be implemented by the Company's Contractor(s) before initiating ground disturbance activities.

Objectives

The objectives of these environmental protection measures are to ensure:

- all known above or below ground hazards are identified prior to abandonment (e.g., building materials and surface staining);
- all environmental resources are properly identified and marked in the field before the initiation of ground disturbance to avoid or reduce potential adverse Project effects;
- the Project footprint is properly delineated to prevent inadvertent trespass; and
- all access to and from the work sites are properly marked to maintain safety and environmental compliance.

Activity/Concern	Mitigation Measures
<i>Hazard Assessment</i>	<ol style="list-style-type: none"> 1. Conduct a pre-abandonment site hazard assessment at the meter stations being abandoned to identify potential hazards associated with onsite infrastructure and/or materials that may be encountered during abandonment activities. 2. Provide results of the site hazard assessment to appropriate project team members.
<i>Staking</i>	<ol style="list-style-type: none"> 3. To prevent inadvertent trespass, stake the approved Project footprint to clearly delineate all boundaries. 4. Mark and locate all foreign lines and cables using One-Call services before the start of abandonment activities.
<i>Environmental Resource Delineation</i>	<ol style="list-style-type: none"> 5. Prior to the start of abandonment activities, clearly mark all sensitive resources as identified on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents and in the Project-specific mitigation tables (Tables 2 and 3). 6. Following clearing, re-mark all sensitive resources as necessary and supplement markings with signage. 7. The Environmental Inspector(s) or designate(s) will confirm the accuracy of all environmentally sensitive resource locations and will ensure marking is maintained during abandonment activities. 8. The Environmental Inspector(s) or designate(s) will identify and notify the Contractor of the appropriate locations for wildlife gaps.
<i>Access Delineation</i>	<ol style="list-style-type: none"> 9. Clearly delineate areas that have access restrictions. Restrict access to Project personnel only.
<i>Hot Line Exposure/ Hydrovac Slurry Management</i>	<ol style="list-style-type: none"> 10. Salvage topsoil prior to hydrovac use in all areas with agricultural potential. 11. All hydrovac activities must be planned and completed in accordance with the Hydrovac Slurry Handling Management Plan (Appendix 1F).

Activity/Concern	Mitigation Measures
<i>Grade Plan</i>	12. The Contractor shall provide a grade plan to the Company, or as specified in the contract documents. The grade plan will be reviewed by the Environmental Inspector(s) or designate(s) to ensure identified environmental resources are addressed as per Project commitments.

7.0 PROJECT-SPECIFIC ENVIRONMENTAL PROTECTION MEASURES

Introduction

This section of the EPP describes the Project-specific environmental protection measures that will be used to protect sensitive environmental features and are in addition to the general environmental protection measures provided in other sections of the EPP. All Project-specific mitigation measures are identified in Table 2, Table 3, the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents.

Objectives

The objectives of these environmental protection measures are to:

- ensure the identification and protection of biophysical and cultural resources identified in Project-specific environmental documents; and
- implement Project-specific abandonment and reclamation mitigation measures to minimize disturbance to environmental features, where avoidance is not technically or economically feasible.

Table 2 summarizes the required Project-specific mitigation measures.

TABLE 2 PROJECT-SPECIFIC MITIGATION MEASURES

Location	EAS / Environmental Figure Mitigation Code	Issue	Timing Windows and/or Regulatory Guidelines	Mitigation	Description of Occurrence/ Other Comments
<ul style="list-style-type: none"> • LENNMS_01 • Lennard Creek RMS • LENNMS_02 • LENL6_02 • 1 CP test station 	CAR	Caribou Range	RAP (Feb 15 – July 15)	<ul style="list-style-type: none"> • Avoid physical abandonment activities (including clearing and reclamation) within the caribou RAP (February 15 through July 15) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEPA and implement appropriate mitigation measures to reduce Project effects on caribou populations and caribou habitat. • If caribou are encountered on roads, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area. • Following completion of physical abandonment activities in caribou range, access management measures and habitat restoration will be completed using measures appropriate to the site type and surrounding vegetation. Follow Reclamation Measures outlined in Section 8.7 of the EPP. 	• N/A
Confirmed Leks	STGR	Sharp-tailed Grouse Leks	Lek Period (March 15 – June 15)	<ul style="list-style-type: none"> • Where active sharp-tailed grouse leks are identified, no physical abandonment activities (including clearing and reclamation) will occur within 500 m of the lek during the lekking period or within 100 m outside of the lekking period. Exceptions will be reviewed by the Company and a Resource Specialist on a case-by-case basis and will only be considered for equipment / vehicle travel. Marshalling of vehicles through setback can occur from March 15 to June 15 between 10:00 AM and 4:00 PM. 	• Known sharp-tailed grouse leks will be confirmed during field surveys conducted during the appropriate timing windows
<ul style="list-style-type: none"> • BIGS12_01 • BIGS12_02 • BIGS12_03RR • BIGS12_04RR • BIGS12_04WC_1 • BIGS12_04WC_2 • BIGS12_05WC_1 • BIGS12_05WC_2 • BIGSL12_01 • BIGSL12_02 • BIGSL12_03 • Kemp River RMS • KEMPMS_01 • KEMPMS_02 • LENL6_02 • Lennard Creek RMS • LENNMS_01 • LENNMS_02 • Maddenville RMS • MADDMS_01 • MADDMS_02 	GRIZ	Grizzly Bear	Bear Denning Period (October 1 to April 30)	<ul style="list-style-type: none"> • Where physical abandonment activities (including clearing and reclamation) within grizzly bear recovery zones are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. • Using a combination of minimal disturbance techniques and natural regeneration, allow PDAs to re-vegetate within grizzly bear recovery zones with vegetative species compatible and consistent with the adjacent vegetation type. 	• N/A

<ul style="list-style-type: none"> • SILV6_01 • SILV6_03RD • SIMO8PT_01 • SIMOMS_07 • Simonette MS PT1 • 12 CP test stations 					
<ul style="list-style-type: none"> • BRUC4_01 • BRUC4_02 • Bruce North RMS • Bruce RMS • BRUCMS_01 • BRUCMS_02 • BRUCN4_02 • BRUCN4_01 • BRUCNMS_01 • BRUCNMS_02 • BRUCPT_01 • LENL6_02 • Lennard Creek RMS • LENNMS_01 • LENNMS_02 • MINB4_02 • MINBMS_01 • MINBMS_02 • Minburn RMS • PION4_03 • PION8L_03 • Pioneer East RMS • RANFMS_01 • RANFMS_02 • Sedgewick East RMS • SEDGMS_01E • SEDGMS_02E • SILV6_01 • UKAL6_01 • UKAL6_02 • UKAL6_04 • UKAL6_05 • UKAL6_06 • UKAL6_07 • UKAL6_08 • UKAL6_09 	SRT OWL	Short-eared Owl	Nesting Period (April 15 to August 15)	<ul style="list-style-type: none"> • If physical abandonment activities (including clearing and reclamation) are scheduled to commence during the owl nesting period (April 15-August 15) refer to the Breeding Bird and Nest Management Plan (Appendix 1F in the EPP). • In the event an active nest is found or breeding behaviour is observed, it will be subject to site-specific mitigation measures based on the Breeding Bird and Nest Management Plan • Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15 	<ul style="list-style-type: none"> • N/A

<ul style="list-style-type: none"> • UKAL6_10 • UKAL6_11 • UKAL6_12 • UKAL6_13 • UKAL6_14 • UKAL6_15 • UKAL6_16 • UKAL6_17 • UKAL6_18 • UKAL6L_01 • UKAL6L_02 • UKAL6L_03 • UKAL6L_04 • UKAL6L_05 • UKALEMS_01 • UKALEMS_02 • UKALMS_01 • UKALMS_02 • UKALMSPTI_01 • Ukalta East RMS • Ukalta RMS • VIKI4_01 • VIKI4_05 • Viking North RMS • VIKINMS_01 • VIKINMS_02 • WHIT6_01 • Whitford RMS • WHITMS_02 • WHITMS_03 • 22 CP test stations 					
<ul style="list-style-type: none"> • AECOC12L_02 • AECOC12L_03 • AECOC8_03 • AECOC8_01 • AECOCL12_01 • AECOCL12_02 • BAIL6_01 • Bailey's Bottom RMS • BAILMS_01 • LOUI6_02 • LOUIMS_01 	N/A	Raptors	Nesting Period/Migratory Bird PMP (March 15 to August 31, inclusive)	<ul style="list-style-type: none"> • If physical abandonment activities (including clearing and reclamation) are scheduled to commence during the raptor nesting period or migratory bird PNP (March 15 to August 31, inclusive) (ECCC 2018; Gregoire 2020, pers. comm.; GOA 2021a), refer to the Breeding Bird and Nest Management Plan (Appendix 1F in the EPP). • In the event an active nest is found or breeding behaviour is observed, it will be subject to site-specific mitigation measures (i.e., clearly marked protective buffer around the nest and/or non-intrusive monitoring) based on the Breeding Bird and Nest Management Plan 	<ul style="list-style-type: none"> • N/A

<ul style="list-style-type: none">• LOUIMS_02• LOUIMS_03• LOUIPT_01• Louisiana Lake MS PTI• Louisiana Lake RMS• LOUSL4_02• LOUSL4_03• MINBMS_01• MINBMS_02• Minburn RMS• SCOT4_01• SCOT4_02• Scotfield RMS• SCOTMS_02• SCOTMS_01• Tide Lake MS PTI• TIDE4PT_01• TIDEMS_01• TIDEN6_02• TIDEN6_03• TIDENMS_01• TILL6PT_01• TILLMS_01• UKAL6_01• UKAL6_02• UKAL6_03WC_1• UKAL6_03WC_2• UKAL6_04• UKAL6_05• UKAL6_06• UKAL6_07• UKAL6_08• UKAL6_09• UKAL6_10• UKAL6_11• UKAL6_12• UKAL6_13• UKAL6_14• UKAL6_15• UKAL6_16• UKAL6_17					
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<ul style="list-style-type: none"> • UKAL6_18 • UKAL6L_01 • UKAL6L_02 • UKAL6L_03 • UKAL6L_04 • UKAL6L_05 • UKALEMS_01 • UKALEMS_02 • UKALMS_01 • UKALMS_02 • UKALMSPTI_01 • Ukalta East RMS • Ukalta RMS • VIKI4_01 • Viking North RMS • VIKINMS_01 • VIKINMS_02 • WHIT6_01 • WHIT6_02RD • WHIT6_03RD • Whitford RMS • WHITMS_02 • WHITMS_03 • 22 CP test stations 					
<ul style="list-style-type: none"> • PION4_03 • PION8L_03 • Pioneer East RMS 	KEY WLD	Key Wildlife and Biodiversity Zone	RAP (January 15 through April 30)	<ul style="list-style-type: none"> • Avoid physical abandonment activities (including clearing and reclamation) within the Key Wildlife and Biodiversity Zone (KWBZ) RAP (January 15 through April 30) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEPA and implement appropriate mitigation measures to reduce Project effects on wildlife. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • AECOC12L_02 • AECOC12L_03 • AECOC8_03 • AECOC8_01 • AECOCL12_01 • AECOCL12_02 • TIDEN6_02 • TIDEN6_03 • TIDENMS_01 • 2 CP test stations 	SNK	Snakes	Activity Period (April 1 to October 31)	<ul style="list-style-type: none"> • PDAs within sensitive snake habitat range and sensitive snake hibernacula range will be swept daily for snakes prior to activity by appropriately trained personnel if physical abandonment activities occur during the snake active period (April 1 to October 31). Snakes encountered within the work area will be relocated to suitable habitat away from the work area as determined on a site-specific basis. • If a snake relocation program is required, a permit for the capture and handling of snakes will be obtained from AEPA prior to commencing the relocation program. Snake relocation will follow appropriate capture and handling guidelines. • Reduce vehicle speed limits on all access roads within sensitive snake habitat range (< 50 km/hr on grid roads, and <30 km/hr on gravel roads/trails) during the snake active period (April 1 to October 31) to reduce snake mortality risk. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • AECOC12L_02 • AECOC12L_03 • AECOC8_03 • AECOC8_01 	AMB	Amphibians	Active Period (April 15 to September 30, depending on species and	<ul style="list-style-type: none"> • Where physical abandonment activities (including clearing and reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity. 	<ul style="list-style-type: none"> • N/A

<ul style="list-style-type: none"> • AECOCL12_01 • AECOCL12_02 • BAIL6_01 • Bailey's Bottom RMS • BAILMS_01 • LOUI6_02 • LOUIMS_01 • LOUIMS_02 • LOUIMS_03 • LOUIPT_01 • Louisiana Lake MS PTI • Louisiana Lake RMS • LOUSL4_02 • LOUSL4_03 • Tide Lake MS PTI • TIDE4PT_01 • TIDEMS_01 • TIDEN6_02 • TIDEN6_03 • TIDENMS_01 • TILL6PT_01 • TILLMS_01 • 11 CP test stations 			seasonal conditions)	<ul style="list-style-type: none"> • Where breeding wetlands are identified within 100 m of the Project footprint, install exclusion fencing around the portion of the Project footprint that overlaps the wetland and/or its 100 m buffer or suitable length based on site conditions as determined by the Environmental Inspector(s) or designate(s) and the Wildlife Resource Specialist prior to physical abandonment activities. Undertake searches of the fenced area and relocate encountered amphibians to suitable habitat outside the exclusion area. Where exclusion fencing is not feasible, undertake area searches daily prior to activity and relocate amphibians to suitable habitat away from the workspace (relocation sites to be determined in field). • If a relocation program is required, a permit for the capture and handling of amphibians will be obtained from AEPA prior to commencing the relocation program. All handling procedures will follow Alberta Wildlife Animal Care Committee Class Protocol #003 – Capture and Handling of Amphibians. The capture and handling of amphibians will occur under the direction of a qualified Wildlife Resource Specialist 	
<ul style="list-style-type: none"> • AECOC12L_02 • AECOC12L_03 • AECOC8_03 • AECOC8_01 • AECOCL12_01 • AECOCL12_02 • LOUI6_02 • LOUSL4_02 • LOUSL4_03 • Tide Lake MS PTI • TIDE4PT_01 • TIDEMS_01 • TIDEN6_02 • TIDEN6_03 • TIDENMS_01 • 8 CP test stations 	SLEND	Slender Mouse-Ear-Cress	N/A	<ul style="list-style-type: none"> • Clearly mark identified rare plant locations prior to the start of Project construction. • Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • TILLMS_01 • TILL6PT_01 	DWARF	Dwarf Woollyheads	N/A	<ul style="list-style-type: none"> • Clearly mark identified rare plant locations prior to the start of Project construction. 	<ul style="list-style-type: none"> • N/A

				<ul style="list-style-type: none"> Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved. 	
All PDAs	N/A	Surface Contour Changes	N/A	<ul style="list-style-type: none"> Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. 	<ul style="list-style-type: none"> N/A
All PDAs	N/A	Remediation of Pre-Existing Contamination	N/A	<ul style="list-style-type: none"> Purge and clean the pipeline segments to be abandoned prior to isolation or other physical abandonment activities. In the event of a spill, refer to the Release Contingency Plan (Appendix 1E of the EPP). 	<ul style="list-style-type: none"> N/A
All PDAs	N/A	Traditional Land and Resource Use (TLRU)	N/A	<ul style="list-style-type: none"> The Company will develop an environmental orientation that will be delivered to ensure that all personnel working on Project construction are informed of Project-specific environmental requirements and sensitivities, before being allowed access to the Project site. The Company will ensure the environmental orientation is provided to the Contractor. The Contractor will present the environmental orientation to all Project construction personnel. The Contractor will keep a log of all personnel that have received the environmental orientation and will provide to the Company upon request. 	<ul style="list-style-type: none"> N/A
<ul style="list-style-type: none"> AECOC12L_03 AECOC8_03 BIGS12_02 BIGS12_03RR BIGS12_04RR BIGS12_04WC_1 BIGS12_04WC_1 BIGS12_05WC_1 BIGS12_05WC_2 BIGSL12_02 Bruce Lateral Bruce North MS PTI Bruce North RMS Bruce RMS BRUCN4_01 BRUCNMS_01 BRUCNMS_02 BRUCPT_01 KEHIMS_01 KEHIMS_02 KEHIMS_03 KEHIMS_04 Kehiwin RMS Kemp River RMS KEMPMS_01 KEMPMS_02 LENL6_02 Lennard Creek RMS LENNMS_01 LENNMS_02 	NTV GRSS	Potential Native Grassland	N/A	<ul style="list-style-type: none"> Where native grassland is identified, site specific mitigation and reclamation measures will be implemented that are consistent with practices outlined in Recovery Strategies for Industrial Development in Native Prairie in the Mixedgrass Natural Subregion of Alberta (Neville et al. 2014) and the Dry Mixedgrass Natural Subregion of Alberta (Gramineae Services Ltd. 2013), as applicable. Specifically: <ul style="list-style-type: none"> Prior to the initiation of physical abandonment activities, NGTL will clearly identify the start/end KPs for native grassland intersecting the PDA, including access. In areas of native grassland, use ground protection materials (e.g., mats) for short-term traffic access in native grassland. The timeframe between topsoil stripping and replacement will be reduced. Topsoil stripping and replacement will occur when native vegetation is dormant within the same year and before the next growing season, where feasible. In native prairie, topsoil removal from the sod layer will be done in such a manner to minimize scalping. Prairie Protectors and/or sweepers or equivalent will be used to minimize disturbance to the sod layer. The Contractor shall ensure that efforts are made to minimize grading to the extent possible. 	<ul style="list-style-type: none"> Fieldwork will be completed to confirm locations with native grassland.

<ul style="list-style-type: none"> • LOUI6_02 • LOUIMS_01 • LOUIMS_02 • LOUIMS_03 • LOUIPT_01 • Louisiana Lake MS PTI • Louisiana Lake RMS • LOUSL4_02 • LOUSL4_03 • Maddenville RMS • MADDMS_01 • MADDMS_02 • PION4_01 • PION4_03 • PION8L_01 • PION8L_03 • Pioneer East RMS • RANF12PT_01 • RANF12PT_02WG_1 • RANF12PT_02WG_2 • RANF12PT_03WG • RANFMS_01 • Ranfurly MS PTI • Sedgewick East RMS • SEDGMS_01E • SEDGMS_02E • SIMO8PT_01 • SIMOMS_07 • Simonette MS PTI • Tide Lake MS PTI • TIDE4PT_01 • TIDEMS_01 • TIDEN6_02 • TIDEN6_03 • TIDENMS_01 • TILL6PT_01 • TILLMS_01 • UKAL6_04 • UKAL6_05 • VIKI4_05 • 13 CP test stations 					
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All abandon in-place	N/A	Abandonment in-Place / Subsidence	N/A	<ul style="list-style-type: none"> • All lateral pipeline isolations will involve cutting, purging (i.e., emptied of service fluids and left without any internal pressure), cleaning of any liquid or debris, and capping. • If issues associated with the abandoned pipelines are identified in the future, NGTL will work with stakeholders and the CER, as needed, to appropriately respond to those issues. Maintaining documentation on where the pipelines are abandoned in-place and communicating this information to landowners, lessees and regional authorities (e.g., municipalities) will reduce potential for effects on other land users, particularly in relation to depth of cover or exposure concerns. 	<ul style="list-style-type: none"> • N/A
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Notes: All locations are approximate. See Environmental Site Information Sheets (ESIS), Environmental Figures and/or other Project-specific environmental documents for additional details.

8.0 METER STATION AND PIPELINE ABANDONMENT

8.1 General Environmental Protection Measures

Introduction

The general environmental protection measures provided below are applicable to all work areas and activities throughout the abandonment phase. These general measures are followed by detailed specifications for the abandonment, reclamation and reclamation monitoring phases of the Project.

Objective

The objective of these environmental protection measures is to:

- avoid or reduce the potential adverse environmental effects associated with abandonment activities.

Activity/Concern	Mitigation Measures
<i>Regulatory Contact</i>	1. Document all field regulatory contacts and forward to the Construction Manager and the Environmental Advisor.
<i>Access</i>	2. Post signage to discourage unauthorized public access onto the Project footprint during abandonment activities. 3. Use frost packing, snow, ice, geotextile and fill, rig mats, swamp mats or access mats for access through wet areas, or as otherwise approved by the Company. 4. Restrict all abandonment activities to the approved Project footprint. All Project traffic will adhere to safety and road closure regulations. 5. For other access measures and guidelines on the Project footprint and associated access roads, refer to the Traffic Control Management Plan (Appendix 1F).
<i>Secondary Containment</i>	6. Ensure pumps, generators, light towers, frost fighters, hand-held fuel containers used within 100 m of a water body have secondary containment that can hold 125% of the fuel tank. This applies to secondary containments that are constructed on site. Where equipment includes double-walled, Envirotank-style design, the minimum requirement shall be 110% of the fuel tank. 7. All fuel tanks, hazardous materials and chemicals shall be stored within appropriate secondary containment per requirements outlined in the Chemical and Waste Management Plan (Appendix 1F). 8. Do not allow fuel, oil, or hazardous material storage within 100 m of a watercourse or waterbody except where secondary containment is provided.
<i>Erosion Controls – Water Pumping</i>	9. The location of all discharge areas shall be approved by the Environmental Inspector(s) or designate(s). 10. Water pumping from the Project footprint shall be released onto stable surfaces in a manner that does not cause erosion of soils, or sedimentation of the watercourse. 11. Using filter bags or other appropriate sediment filtering devices, pump water onto stable, well vegetated areas, tarpaulins, sheeting, rocks, sand bags, or into settling ponds. Complete dewatering in a manner that does not cause erosion or allow sediment to re-enter a watercourse or waterbody.

Activity/Concern	Mitigation Measures
<i>Erosion Controls – Water Pumping (cont'd)</i>	<p>12. Do not permit pumped water to flow directly into any watercourse. If water is released onto private land, landowner consent must be acquired prior to release.</p> <p>13. The Contractor will ensure the pump intake is elevated to minimize the pumping of sediment.</p> <p>14. The Contractor will ensure hoses and pumps are of sufficient length and capacity to transfer water to the desired location.</p> <p>15. The Contractor will ensure hoses are in good working condition, and hoses with tears or ruptures will be repaired or replaced.</p>
<i>Sedimentation / Erosion Control</i>	<p>16. The Contractor shall be responsible for establishing, supplying, installing, maintaining and removing temporary and permanent erosion and sediment control measures for right-of-way and cross right-of-way runoff, ditch dewatering and hydrostatic test dewatering. This responsibility will also include all pipe yards, construction yards, camps, access roads, trails and facility sites.</p> <p>17. The Contractor will use berms, cross ditches, sediment fencing and/or other appropriate erosion and sediment control measures to prevent erosion and the migration of sediment off of the Project footprint.</p> <p>18. The Contractor shall maintain all erosion and sediment control in good working order through a scheduled inspection and maintenance program.</p>
<i>Hydrology</i>	<p>19. If springs and ground water are encountered, the Company will review the area and determine the appropriate mitigation.</p> <p>20. Leave gaps in windrows (e.g., topsoil/strippings, grade spoil, rollback, snow) and strung pipe at obvious drainages, on side-hill terrain and wherever seepage occurs to reduce interference with natural drainage patterns.</p>
<i>Wildlife</i>	<p>21. Leave gaps in windrows (e.g., topsoil/strippings, grade spoil, rollback, snow) and strung pipe at wildlife trails, and to allow for livestock and vehicle/machinery passage across the Project footprint. Locations where wildlife gaps are appropriate will be determined in the field by the Environmental Inspector(s) or designate(s). Gaps should align.</p> <p>22. Unanticipated wildlife issues encountered during abandonment activities will be discussed and resolved by the Environmental Inspector(s) or designate(s), Wildlife Resource Specialist(s), and the responsible regulatory agencies, if necessary.</p> <p>23. If wildlife or livestock are discovered in the excavation/trench, or in association with any other activity or facility, report to the Environmental Inspector(s) or designate(s) who will contact the responsible regulatory agencies, as required. In the case of livestock, the land agent assigned to the Project will contact the landowner.</p> <p>24. Project personnel are prohibited from hunting or fishing on the Project footprint, and from harassing, feeding, collecting or possessing wildlife species.</p> <p>25. Do not harass or feed wildlife or livestock. Do not permit Project personnel to have dogs on the Project footprint. Firearms are not permitted in Project vehicles or on the Project footprint, or at associated Project facilities. In addition, prohibit the recreational use of all-terrain vehicles (ATVs) or snowmobiles by Project personnel on the Project footprint. Report any incidents with wildlife to the Environmental Inspector(s) or designate(s) immediately.</p>

Activity/Concern	Mitigation Measures
<i>Listed or Sensitive Wildlife Species</i>	<p>26. If previously unidentified listed or sensitive wildlife species or their site-specific habitat (e.g., dens, nests) are identified during Project abandonment activities, report to the Environmental Inspector(s) or designate(s) and implement the Wildlife Species of Concern Discovery Contingency Plan (Appendix 1E).</p> <p>27. Report sightings of Project-specific species of interest to the Environmental Inspector(s) or designate(s). Specific protection measures may be implemented and the sighting will be recorded.</p>
<i>Rare Plants / Rare Ecological Communities</i>	<p>28. If previously unidentified rare plants or rare ecological communities are found on the Project footprint prior to or during abandonment activities, implement the Plant Species and Ecological Communities of Concern Discovery Contingency Plan (Appendix 1E).</p> <p>29. Clearly mark identified rare plant locations prior to the start of abandonment activities.</p> <p>30. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of abandonment activities to ensure there is full understanding of the procedures involved.</p>
<i>Equipment Cleaning</i>	<p>31. All equipment, including mats, must be clean and free of soil or vegetative debris prior to use on site. Equipment will be inspected by the Environmental Inspector(s) or designate(s), and if deemed to be in appropriate condition will be approved for use and identified with a suitable marker or tag. Any equipment, including mats, which do not arrive in appropriate condition shall not be allowed to perform any work until it has been cleaned, re-inspected by the Environmental Inspector(s) or designate(s), and deemed suitable for use.</p> <p>32. Prior to equipment being used in a watercourse crossing, the Environmental Inspector or designate and Contractor shall conduct visual inspections for signs of leaks and contamination. Visual observations will be documented by the Environmental Inspector or Designate. The Contractor shall provide the Company the cleaning procedures utilized as well as documented proof of equipment cleanliness for review.</p> <p>33. To minimize the potential for transporting clubroot to the Project footprint, following thorough cleaning to remove all soil and vegetative debris, all equipment including mats, shall be sanitized by misting with a weak disinfectant solution (i.e., 1-2% bleach), prior to conducting work on the Project, unless otherwise directed by the Environmental Inspector(s) or designate(s).</p>
<i>Weeds</i>	<p>34. Apply mitigations for any locations identified as having listed weed infestations according to applicable regulatory requirements, as identified in the list of Project-specific mitigation measures (Table 2).</p> <p>35. Salvage and store topsoil/strippings separately where listed weed infestations are identified on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents.</p> <p>36. Monitor topsoil/strippings piles for weed growth during the course of abandonment and implement corrective measures (e.g., spraying, mowing, hand pulling) to avoid infestation when warranted.</p> <p>37. If previously unidentified locations with listed weed infestations or invasive aquatic plants are found on the Project footprint during abandonment, the Environmental Inspector(s) or designate(s) will be contacted and will establish the appropriate mitigation or control procedures prior to continuing abandonment activities in the area.</p>

Activity/Concern	Mitigation Measures
<i>Weeds (cont'd)</i>	<p>38. Unless a certificate of weed analysis can be provided, all construction material sources used for supplies of sand, gravel, rock, straw and mulch will be visually inspected to ensure they are free of listed weeds to the extent practical. If sources are suspected as having listed weeds, they shall be sampled and lab analyzed to ensure they meet the requirements of the responsible regulatory agency prior to obtaining or transporting any material to the Project site.</p> <p>39. Where straw is required, it will be sourced from the Project area to the extent feasible. Should local sources not be available, approval from the landowner and responsible regulatory agency, where required, will be secured prior to importing from outside of the Project area. Potential source locations will be inspected to the extent practical for listed weeds. Prior to securing straw from any source (other than from the landowner supplied straw) provisions will be taken (assessment of field(s), and/or straw testing from an independent lab for weed analysis) to prevent the introduction or spread of listed weeds.</p>
<i>Use of Herbicides</i>	<p>40. Use of herbicides on the Project footprint is prohibited unless otherwise approved by the Company.</p> <p>41. Restrict the general application of herbicides near rare plants or rare ecological communities. Spot spraying, wicking, mowing, or hand-picking are acceptable measures for weed control in these areas.</p> <p>42. Prohibit the use of herbicides within 30 m of an open body of water, unless the herbicide application is conducted by ground application equipment, or otherwise approved by the responsible regulatory agency.</p>
<i>Wetlands</i>	<p>43. The Company will obtain regulatory approval for Project activities occurring within wetlands, as required. Construct the wetland crossings in accordance with the applicable regulatory requirements.</p> <p>44. Minimize the removal of vegetation in wetlands to the extent possible.</p> <p>45. Conduct ground level cutting/mowing/mulching of wetland vegetation instead of grubbing. The method of removal of wetland vegetation is subject to approval by the Company.</p> <p>46. Direct grading away from wetlands.</p> <p>47. Minimize grading within wetland boundary. Do not use temporary workspace within the boundaries of wetlands, unless required for site specific purposes. Temporary workspace within the boundary of a wetland must be approved by the Environmental Inspector(s) or designate(s).</p> <p>48. If ground conditions are encountered that create potential for rutting, admixing or compaction, then minimize ground disturbance by using a protective layer such as frost packing, snow, ice, geotextile and fill, rig mats, swamp mats, or access mats between the wetland's root/seed bed and construction equipment.</p> <p>49. Replace excavation and/or trench material as soon as feasible, and re-establish pre-abandonment contours within wetland boundary to facilitate cross right-of-way drainage.</p> <p>50. The Contractor will use berms, cross ditches, sediment fencing and/or other appropriate measures to prevent erosion and siltation into adjacent wetland areas, unless otherwise directed by the Company. Refer to the Soil Erosion Contingency Plan (Appendix 1E) for additional measures.</p> <p>51. Where there are permanent or temporary access roads, maintain cross-drainage to allow water to move from one side of the access road to the other.</p>

Activity/Concern	Mitigation Measures
<i>Wetlands (cont'd)</i>	<p>52. Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise directed by the Company.</p> <p>53. The Company will obtain regulatory approval prior to infilling wetlands, where required.</p>
<i>Historical and Palaeontological Resources; Potential Human Remains</i>	<p>54. If historical or palaeontological features (e.g., arrow heads, modified bone, pottery fragments, fossils) not previously identified are found on the Project footprint during abandonment activities, implement the measures outlined in the Cultural Resource Discovery Contingency Plan (Appendix 1E).</p> <p>55. Prohibit the collection of Historical Resources by Project personnel.</p> <p>56. If potential human remains are found on the Project footprint during abandonment activities, implement the measures outlined in the Cultural Resource Discovery Contingency Plan (Appendix 1E).</p>
<i>Traditional Land Use Resources</i>	<p>57. If traditional land use (TLU) sites not previously identified are found on the Project footprint during abandonment activities, implement the Cultural Resource Discovery Contingency Plan (Appendix 1E).</p>
<i>Waste Disposal</i>	<p>58. The Contractor will collect all Project debris and other waste materials and dispose of daily at an approved facility and in accordance with the Chemical and Waste Management Plan (Appendix 1F) and the Release Contingency Plan (Appendix 1E) unless otherwise authorized by the Environmental Inspector(s).</p> <p>59. After appropriate testing of pipe and coatings, dispose excavated pipe segments at an approved waste or recycling facility using the TC Energy Environmental Management of Industrial and Hazardous Waste Standards (CAN) and the Contaminated Soil Contingency Plan (Appendix 1E).</p> <p>60. After appropriate testing, dispose of building materials and unwanted instrumentation at an approved waste or recycling facility using the TC Energy Environmental Management of Industrial and Hazardous Waste Standards (CAN) and the Contaminated Soil Contingency Plan (Appendix 1E).</p> <p>61. Dispose of all waste materials according to and in conformance with Project plans and pertinent regulatory requirements.</p> <p>62. Ensure that the abandonment sites are left in a tidy and organized condition at the end of each day.</p>
<i>Contaminated Soils, Materials or Groundwater</i>	<p>63. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soil Contingency Plan (Appendix 1E) and the Chemical and Waste Management Plan (Appendix 1F).</p>
<i>Fire Prevention</i>	<p>64. Ensure that personnel are made aware of the proper disposal methods for welding rods, cigarette butts and other hot or burning material.</p> <p>65. Necessary fire-fighting equipment will be on site in accordance with the requirements of the responsible regulatory authority.</p> <p>66. All motorized equipment must carry a fully charged fire extinguisher. The Contractor will ensure that fire extinguishers are present and fully charged and all fireline equipment is present and in working order.</p> <p>67. Ensure the Contractor has the necessary fire-fighting equipment on hand that is capable of controlling any fire that may occur as a result of their activities, as identified by provincial regulations and responsible government agencies.</p> <p>68. The fire equipment and water supply on site will be increased as the fire hazard increases.</p>

Activity/Concern	Mitigation Measures
<i>Fire Prevention (cont'd)</i>	<p>69. Only burn slash if permission is granted from the regulating authorities and if conditions permit. If burning is delayed, store slash on the Project footprint. All burning will be completed in accordance with the applicable regulations and permits.</p> <p>70. For activities conducted during the fire season as determined by the applicable jurisdiction, determine the Fire Danger Class for the location, and communicate it to onsite personnel on a regular basis.</p> <p>71. In the event of a fire or elevated fire hazard conditions according to applicable guidelines or regulations, follow the measures outlined in the Fire Suppression Contingency Plan (Appendix 1E).</p>
<i>Release Prevention and Containment</i>	<p>72. In the event of a release of any size, the Contractor shall immediately report the release to the Environmental Inspector(s) or designate(s).</p> <p>73. Appropriate release prevention and response, containment and recovery equipment will be maintained at all work sites, in accordance with the Chemical and Waste Management Plan (Appendix 1F)</p> <p>74. If an accidental release does occur, measures to control, contain, recover and clean up the release are to be implemented immediately to minimize the potential for adverse environmental and human health effects, or to ensure the release does not spread or increase in size. Refer to the Release Contingency Plan (Appendix 1E)</p> <p>75. All equipment shall arrive on the project free of leaks and in good working condition. Any equipment which does not arrive free of leaks and in good working condition shall not be allowed to perform any work until it has been repaired, re-inspected by the Environmental Inspector(s) or designate(s), and deemed suitable for use.</p> <p>76. The Contractor will ensure equipment is monitored regularly and free of fluid leaks.</p> <p>77. Do not wash equipment or machinery within 30 m of watercourses or waterbodies.</p> <p>78. Equipment to be used in or adjacent to a watercourse or waterbody will be clean or otherwise free of external grease, oil or other fluids, mud, soil and vegetation, prior to entering the waterbody.</p> <p>79. Bulk fuel trucks, service vehicles, and pick-up trucks equipped with box-mounted fuel tanks shall carry release prevention, containment, and clean-up materials that are suitable for the volume of fuels or oils carried, in accordance with the Chemical and Waste Management Plan (Appendix 1F).</p> <p>80. Release contingency material carried on bulk fuel and service vehicles, or in environmental response units shall be suitable for use on land and water.</p>
<i>Significant Adverse Effects on the Environment</i>	<p>81. In the event of a release, refer to the Release Contingency Plan (Appendix 1E).</p> <p>82. Contact the Company's Regulatory Compliance team within 2 hours of a release of any chemical or physical substance at a concentration or volume sufficient to cause or potentially cause an irreversible, long-term, or continuous change to the ambient environment in a manner that causes harm to human life, wildlife, or vegetation.</p>

Activity/Concern	Mitigation Measures
<i>Equipment Refuelling and Servicing</i>	<p>83. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.</p> <p>84. Where equipment refuelling is required within 100 m of a watercourse or waterbody, employ the following measures to reduce the risk of fuel releases into water:</p> <ul style="list-style-type: none">▪ All containers, hoses, nozzles are free of leaks▪ All fuel nozzles are equipped with automatic shut offs; and▪ Always have operators stationed at both ends of the hose during fuelling
<i>Air Quality/Emissions</i>	<p>85. Reduce idling of equipment, where possible.</p> <p>86. The Contractor will ensure equipment is well-maintained.</p> <p>87. Where practical and applicable, use multi-passenger vehicles for the transport of crews to and from job sites.</p>
<i>Dust Control</i>	<p>88. Where traffic as a result of the Project has the potential to create a hazardous or irritating level of dust to nearby residents, dust control on existing access roads will be achieved through the application of water or calcium chloride (or equivalent). Only water will be used for dust control on the Project footprint.</p>
<i>Noise</i>	<p>89. Ensure that noise abatement equipment on machinery is in good working order.</p> <p>90. Take reasonable measures to control Project related noise near residential areas.</p>
<i>Fences</i>	<p>91. Properly brace all fences cut for the Project and equip with temporary gates. Temporary gates will be a minimum of three-wire. Keep gates closed, except during passage of vehicles, unless otherwise approved by the Company.</p>

8.2 Clearing and Vegetation Removal

Introduction

This EPP takes into account the previous, current and future land use. The Project is located largely on previously disturbed lands and, consequently, only limited vegetation clearing, topsoil/strippings salvage and grading will be necessary prior to abandonment activities. The following measures will be implemented by the Company's Contractor during the clearing phase of Project construction.

Objectives

The objectives of these environmental protection measures are to:

- restrict the Project footprint to approved workspaces;
- limit the disturbance to vegetation (i.e., crops and native vegetation) to the extent practical; and
- minimize surface disturbance to the extent practical.

Activity/Concern	Mitigation Measures
<i>Minimal Surface Disturbance</i>	<ol style="list-style-type: none"> 1. To assist in maintaining an intact ground surface in areas where grading is not necessary, implement minimum surface disturbance techniques such as mulching, brushcutters, brushhogs or other equipment. Non-merchantable timber shall be mulched or skidded to the closest burn pile location. 2. Where stripping and grading is not required during frozen ground conditions or in Crown non-agricultural land use, implement minimal surface disturbance techniques in accordance with the typical drawing (Appendix 1D, Dwg. STDS-03-ML-05-445), and as indicated on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environment documents.
<i>Clearing</i>	<ol style="list-style-type: none"> 3. If vegetation removal is required to access physical abandonment activity areas, clear timber, stumps, brush and other vegetation within the marked Project footprint. Clearing methods will take into account land use and landowner/leaseholder requirements. 4. Remove trees that are a safety hazard during abandonment activities off of the Project footprint, following consultation with the Environmental Inspector(s) or designate(s). 5. Fell all trees damaged during clearing and abandonment activities immediately. A damaged tree is defined as one that has fractures or bark loss for 50% of its circumference. 6. Conduct clearing near watercourses or wetlands as described in Section 8.1 and 8.4 of this EPP. 7. During clearing, fell trees towards the Project footprint wherever possible. Recover trees that inadvertently fall into adjacent undisturbed vegetation. 8. Avoid disturbance to environmentally sensitive features during clearing as identified by the appropriate signage and/or fencing. The Environmental Inspector(s) or designate(s) and appropriate Environmental Resource Specialist will determine the size of avoidance buffer surrounding these features, if appropriate. 9. Where practical, leave stumps in place, particularly on streambanks, to provide surface stability. Stumps that are removed will be used as rollback or will be disposed of by burning or chipping, where approved.
<i>Known Archaeological Sites</i>	<ol style="list-style-type: none"> 10. Do not permit clearing in proximity to known archaeological sites unless otherwise approved by the responsible regulatory agency.

Activity/Concern	Mitigation Measures
<i>Wet Terrain / Muskeg</i>	11. Where non-frozen soils are encountered during abandonment activities, refer to the Wet Soils Contingency Plan (Appendix 1E). Install rig mats, swamp mats, access mats or equivalent, or corduroy, or geotextile and fill (excluding topsoil or other surface materials), as approved by the Company, in areas of wet soils to reduce terrain disturbance and soil structure damage. These materials will be removed during clean-up.
<i>Merchantable/ Salvageable Timber</i>	12. Merchantable timber shall be cut and salvaged as outlined within the Timber Salvage Plan and to the forest tenure holder's specifications. All timber shall be cut as close to the ground as possible to reduce the quantity of woody debris following clearing operations. 13. Do not bulldoze salvageable timber. 14. Suspend timber skidding operations or implement alternative measures if the potential exists for merchantable timber to be damaged through contact with wet or muddy soils.
<i>Decking Sites</i>	15. Locate deck sites in previously disturbed areas, wherever practical. 16. In forested lands, avoid stripping and grading at deck sites, unless otherwise directed by the Company. Do not salvage topsoil or upper surface material at deck sites. Merchantable timber shall be skidded to the closest log deck (outside of log deck), where timber is to be processed (i.e., de-limbed and topped) and then placed into log deck. Tops and limbs shall be burned on ditch trench line adjacent to the deck location. 17. In freehold and designated Crown agricultural lands, salvage topsoil at deck sites, unless otherwise directed by the Company.
<i>Grubbing</i>	18. Conduct grubbing only where stripping and grading is required. 19. Grub tree roots, where required, with a hoe and thumb or alternate equipment to preserve surface organic material. 20. Use a stump mulcher rather than grubbing on areas where stripping and grading is not necessary. 21. Reduce grubbing near watercourses, muskeg, and other wet areas to facilitate the restoration of shrub communities.
<i>Vegetation Disposal</i>	22. Timber and brush disposal options are subject to agreements with landowners, occupants and the responsible regulatory agency where public lands are intersected. 23. Dispose of all timber material not salvaged for merchantability or required for access control and/or erosion control through burning or mulching, unless otherwise directed by the Environmental Inspector(s) or designate(s) and Construction Manager. 24. Obtain applicable permits prior to burning. Follow guidance in the applicable legislation. 25. Do not undertake burning within 100 m of a waterbody, unless otherwise authorized by the Environmental Inspector(s) or designate(s). 26. Implement techniques to limit smoke production including limiting pile size, minimizing moisture content and maintaining loose burning piles with minimal soil.

Activity/Concern	Mitigation Measures
<i>Vegetation Disposal (cont'd)</i>	<p>27. Avoid locating burn piles on peat rich areas where residual fires could persist after abandonment. Burn piles will be located along trench line or on approved areas where strippings have been removed.</p> <p>28. If timber and brush are disposed of by mechanical means (i.e., mulching), the maximum depth of mulch is 5 cm or in accordance with the applicable provincial legislation, whichever depth is less. Obtain landowner authorization prior to initiating mulching activity on private land.</p>

8.3 Topsoil/ Strippings Salvage and Grading

Introduction

Soil will be salvaged as indicated on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environment documents. Soil salvage depths and handling procedures have been determined through existing land use and/or through field soil surveys to ensure that appropriate material handling procedures are implemented. Topsoil/ strippings handling methods for both frozen and non-frozen conditions have been included.

Objectives

The objectives of these environmental protection measures are to:

- avoid or reduce impacts of abandonment activities on all lands;
- maintain equivalent land capability on lands within the Project footprint (excluding aboveground facilities);
- minimize effects to soil capability, surface drainage patterns, land use, and wildlife habitat;
- comply with commitments made to the landowner or responsible land manager; and
- employ environmentally and economically responsible practices at all times and in accordance with applicable industry standards.

Activity/Concern	Mitigation Measures
<i>Minimal Surface Disturbance</i>	1. Where stripping and grading is not required during frozen ground conditions or in Crown non-agricultural land use, implement minimal surface disturbance techniques in accordance with the typical drawing (Appendix 1D, Dwg. STDS-03-ML-05-445) and as indicated on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents. Snow/surface organic material mixture refers to snow and mulch only.
<i>Land Preparation - Non-Frozen Conditions (Agricultural Land)</i>	2. Arrange for landowners to harvest crops, if practical. Mow, cut or bale any remaining crops and remove from the Project footprint to facilitate topsoil handling. 3. Disc the Project footprint prior to topsoil stripping, unless otherwise approved by the Environmental Inspector(s) or designate(s) on agricultural lands.

Activity/Concern	Mitigation Measures
<i>General Topsoil/ Strippings Salvage Requirements</i>	<ol style="list-style-type: none"> 4. Salvage topsoil/strippings as indicated on the Environmental Alignment Sheets, Environmental Figures and/or other Project-specific environmental documents and in accordance with the typical drawings. 5. If wet/thawed soil conditions occur, implement the Wet Soil Contingency Plan (Appendix 1E). 6. Typical drawings for topsoil/strippings handling (e.g., non-frozen and frozen) are provided in Appendix 1D of this EPP. 7. Snow and topsoil/strippings will be salvaged and stockpiled separately. 8. Following salvage of the topsoil/strippings, if warranted, stabilize topsoil/strippings windrows and stockpiles where the potential for erosion exists. Refer to the Soil Erosion Contingency Plan for additional information (Appendix 1E). 9. Should high winds or heavy rains damage the tackifier during abandonment activities, contingency measures outlined in the Adverse Weather Contingency Plan (Appendix 1E) will be implemented. 10. Should Project traffic or other related Project activity disturb the topsoil/strippings piles and there is a potential for wind erosion, apply additional water and/or tackifier, if warranted.
<i>Topsoil Salvage Requirements (Agricultural Land)</i>	<ol style="list-style-type: none"> 11. Conduct topsoil salvage on all arable or potentially arable lands to promote successful reclamation and ensure this resource is returned to an equivalent land capability. 12. Depending on site specific conditions, including forested agricultural potential land use, topsoil salvage techniques may include full width, blade width, ditch and spoil side, or ditch and work side. The topsoil salvage technique to be used will be determined by the Environmental Inspector(s) or designate(s), Construction Manager, and the appropriate Environmental Resource Specialists, where required. 13. Where full width stripping is not conducted, salvage a greater width of topsoil at sharp sidebends and at crossings of watercourses, roads and foreign lines to accommodate a wider and deeper trench. 14. On agricultural lands, topsoil handling procedures may be modified based on the need to meet the objective of protecting the soil resources, as directed by the Environmental Inspector(s) or designate(s). Soil storage areas will be approved by the Environmental Inspector(s) or designate(s). 15. Implement the Soil Handling Contingency Plan (Appendix 1E) if any of the following are encountered: little to no topsoil present; uneven boundary between topsoil and subsoil; uneven surface on pasture; request for alternate soil handling methods by a landowner; or soil pulverization and high winds. 16. A soils specialist will be available as needed to work with the Environmental Inspector(s) or designate(s), inspection team and Contractor to address soils resource issues as they may arise during topsoil stripping operations, as well as during adverse weather conditions to ensure the soils resources are protected and equivalent land capability is maintained.

Activity/Concern	Mitigation Measures
<i>Topsoil Salvage Requirements – Frozen Conditions (Agricultural Land)</i>	17. Consult with the Environmental Inspector(s) or designate(s) to ensure that topsoil stripping activities leading up to the onset of frozen conditions do not allow for topsoil/subsoil admixing. Refer to the Soil Handling Contingency Plan (Appendix 1E) for additional information. 18. In the event that topsoil is stripped during frozen conditions, the Environmental Inspector(s) or designate(s) in consultation with the Construction Manager and soils specialist, if warranted, will ensure that proper equipment (i.e., frozen topsoil cutter, grinder or equivalent) is used to minimize the mixing of topsoil and subsoil layers, and the equivalent land capability is maintained. 19. Snow and topsoil will be salvaged and stockpiled separately.
<i>Snow Management</i>	20. In the event of excessive snow depths discuss snow management with the responsible regulatory agency.
<i>Adverse Weather</i>	21. In the event of adverse weather that could result in rutting, sedimentation and erosion, and/or compaction, the Environmental Inspector(s) or designate(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the Adverse Weather Contingency Plan (Appendix 1E). A soils specialist and/or the responsible regulatory agency may be consulted, if warranted. 22. Following an adverse weather event, confirm the efficacy of sediment and erosion control measures and whether corrective action is required.
<i>Grading</i>	23. Undertake all grading with the understanding that original contours and drainage patterns will be re-established during clean-up unless otherwise authorized by the Environmental Inspector(s) or designate(s), or identified on Project-specific drawings. 24. Salvage topsoil/strippings from areas to be graded. 25. Ensure grade material does not spread off the Project footprint.
<i>Known Archaeological Sites</i>	26. Do not permit grading in proximity to known archaeological sites unless otherwise approved by the responsible regulatory agency.

8.4 Watercourse Crossings

Introduction

There are no planned instream works associated with the Program aside from temporary crossing of watercourses. This EPP provides mitigation measures that will be utilized for work required within a riparian zone or watercourse as necessitated by site conditions or technical issues related to physical abandonment. The objectives of the measures are to avoid or minimize impacts and comply with all provincial and federal regulatory requirements. The method(s) of temporary vehicular crossings will take into consideration engineering and constructability requirements, fisheries values and protection of riparian habitats. The environmental protection measures outlined in this section apply to all watercourses identified on the Project footprint. Where watercourses are present, details on specific watercourse protection measures are provided in Table 3.

Objectives

The objectives of these environmental protection measures are to:

- avoid or reduce potential adverse impacts;
- comply with the fisheries protection provisions of the *Fisheries Act* by applying *DFO Measures to Protect Fish and Fish Habitat* and *DFO Standards and Codes of Practice* (DFO 2019, 2021);
- comply with all provincial and federal regulatory requirements;
- comply with all regulatory approval conditions;
- employ environmentally responsible construction practices that are technically and economically feasible, in accordance with applicable industry best practices and standards;
- maintain equivalent habitat quality at crossing locations;
- protect riparian areas in proximity to abandonment activities; and
- maintain the ecosystem function of riparian areas.

Activity/Concern	Mitigation Measures
<i>Permits and Approvals</i>	1. The Company will obtain and follow all applicable federal and provincial approvals prior to the commencement of abandonment and in-stream activities.
<i>Notification</i>	2. The Company will notify an inspector, fishery officer or prescribed authority of any occurrence that results in harmful alteration, disruption or destruction to fish and fish habitat that is not authorized, or when there is an imminent risk of such an occurrence. 3. Ensure all watercourse crossing notifications are completed in accordance with applicable guidelines, environmental protection measures, approval conditions or legislation.
<i>Signage</i>	4. Install warning signs along the banks both upstream and downstream of the crossing to caution users of a navigational hazard, where appropriate. 5. Post signs at watercourses immediately following clearing (include name, number and KP). Signs will be posted 100 m from the watercourse or at the top of the valley slope, whichever is greater, to alert the Contractor of the upcoming watercourse.
<i>Fisheries Timing Window</i>	6. Refer to Table 3, if applicable, for the appropriate fisheries timing window(s) associated with the watercourse crossings traversed by the Project.

Activity/Concern	Mitigation Measures
	<p>7. Abandonment activity in a watercourse shall comply with the appropriate fisheries timing window(s) unless:</p> <ul style="list-style-type: none"> • An alternate timing window is recommended by a qualified environmental professional; • the watercourse is dry or frozen to the bottom at the time of work; • trenchless techniques are employed; or • approval from the responsible regulatory authority is obtained.
<i>Riparian Buffers</i>	<p>8. Prohibit clearing of extra temporary workspace within a 10 m (minimum) riparian buffer from top of bank of the watercourse unless otherwise approved by the Environmental Inspector(s) or designate(s). This area shall be clearly marked prior to clearing operations. The right-of-way will be narrowed through the riparian area, if feasible.</p> <p>9. Limit clearing of trees at watercourse crossings to the area required to complete the removal. Shrubs and understory vegetation can be cleared from the trench line and work side areas to facilitate the removal.</p> <p>10. Fell trees away from watercourses where feasible. Immediately remove trees, debris or soil inadvertently deposited below the high watermark of a watercourse.</p> <p>11. If the working surface is unstable, do not permit clearing equipment within the 10 m riparian buffer, unless otherwise approved by the Environmental Inspector(s) or designate(s). Following clearing, the 10 m riparian buffer will remain intact (i.e., consisting of low-lying understory vegetation).</p>
<i>Grading</i>	<p>12. Delay grading of the primary banks of watercourses until immediately before construction of the crossing. If required, appropriate temporary erosion and sediment control structures shall be installed at the discretion of the Environmental Inspector(s) or designate(s), upon initial disturbance of the vegetative mat and strippings.</p> <p>13. Direct grading away from waterbodies. Do not place fill material in a waterbody during grading.</p> <p>14. Ensure that grubbing, stripping and grading on approach slopes to watercourses is restricted to an amount required to allow the safe passage of equipment, excavation of the trench, and removal of the pipeline.</p> <p>15. Do not allow grading within the 10 m riparian buffer immediately adjacent to the watercourse crossing until installation of the vehicle crossing, unless otherwise approved by the Environmental Inspector(s) or designate(s).</p>
<i>Sedimentation/ Erosion Control</i>	<p>16. Install erosion and sediment control at all watercourses and/or waterbodies unless otherwise approved by the Environmental Inspector(s) or designate(s) (Appendix 1D, Dwgs. STDS-03-ML-05-001, STDS-03-ML-05-131, STDS-03-ML-05-132 and STDS-03-ML-05-137).</p> <p>17. Where water erosion is evident, and there is potential for runoff from the Project footprint to flow into a watercourse, refer to the Soil Erosion Contingency Plan (Appendix 1E).</p>
<i>Vehicle Crossings - General</i>	<p>18. Do not permit fording of watercourses, unless otherwise approved by the Company.</p> <p>19. Where approved by the Company, for the one-time (over and back) fording of equipment without a temporary crossing structure, use streambank and bed protection methods (e.g., matting), as directed by the Environmental Inspector(s) or designate(s).</p>

Activity/Concern	Mitigation Measures
	<p>20. Construct or install temporary vehicle access across waterbodies, shorelines, and riverbanks in a manner that protects the banks from erosion, maintains the flows in the waterway, and is completed in accordance with applicable guidelines, environmental protection measures, approval conditions or legislation, including applicable DFO <i>Measures to Protect Fish and Fish Habitat</i> and DFO <i>Standards and Codes of Practice</i> (DFO 2019, 2021).</p>
<p><i>Vehicle Crossings - General (cont'd)</i></p>	<p>21. Construct/install all watercourse vehicle crossings as outlined in Table 3, if applicable, and in accordance with the typical drawings (Appendix 1D, Dwgs. STDS-03-ML-05-101, STDS-03-ML-05-103 and 000871-2020-MP-08-0001 00).</p> <p>22. Construct all bridges (e.g., single-span, ice and snowfill) beyond the ends of the banks and with sufficient depth/height and ramp length to protect the banks for the duration of abandonment. Do not place fill within primary banks for bridge abutment construction, unless approved by the responsible regulatory agency.</p> <p>23. If hauling in of fill material is required during the construction of bridge abutments with wings, place geotextile fabric between the fill material and the surface layer.</p> <p>24. Line single-span bridges with impervious geotextile. All watercourse crossing structures must have a minimum of 30 cm high side boards. Side containment for single span bridges must be constructed of plywood or steel curbs, unless otherwise approved by the Company. Snow bridges can use watered snow.</p> <p>25. Install and remove temporary vehicle crossings in a manner that protects the banks from erosion and maintains flow. Temporary vehicle crossings will be returned to their preconstruction condition.</p> <p>26. Consider alternate methods of vehicle crossings on a site-specific basis. The decision-making process will include the Construction Manager and the Environmental Inspector(s) or designate(s). Decision criteria will include the protection of the riparian vegetation and fisheries values associated with the crossing, and applicable legislation and approval conditions.</p>
<p><i>Vehicle Crossings – Frozen Conditions</i></p>	<p>27. Under frozen conditions, and where conditions permit, employ ice and snowfill bridges as temporary crossing structures. Install ice and snowfill bridges using non-chlorinated water drawn from an approved source and/or clean snow ploughed in from surrounding areas or produced through snowmaking.</p> <p>28. If water withdrawal is necessary for the construction of a temporary crossing, ensure that necessary provincial approvals are in place and apply applicable DFO <i>Measures to Protect Fish and Fish Habitat</i> (DFO 2020). Ensure water withdrawal is in compliance with site-specific permit or license conditions. Follow design requirements of DFO <i>Interim Code of Practice: End-of-Pipe Fish Protection Screens</i> (DFO 2020). Pump intakes should not disturb the streambed. Pumps must be screened with a maximum mesh size of 2.54 mm (0.1”) and have a maximum approach velocity of 0.035 m/s (0.11 ft/s) where fish habitat is present, unless fish species-specific approach velocities are calculated using the End-of-Pipe Screen Size Tool.</p> <p>29. Use only clean ice/snow for construction of a snowfill or ice bridge. Approaches shall be constructed with compacted snow and ice of sufficient thickness to protect stream banks. Sand, gravel and soils are not to be used for ice bridge and snowfill approaches.</p>

Activity/Concern	Mitigation Measures
	<p>30. Ensure that ice bridges or snowfills do not interfere with or impede winter flows.</p> <p>31. Snowfills and ice bridges shall be regularly maintained to remove soil, mud and other debris prior to affecting water quality, as directed by the Environmental Inspector(s) or designate(s).</p> <p>32. If conditions will not support the construction of ice bridges or snowfills, then employ other temporary crossing structures approved by the Environmental Inspector(s) or designate(s).</p>
<i>Beaver Dams and Lodges</i>	<p>33. In the event that beaver dams or lodges will be disturbed or removed, provide notification to or obtain the necessary permits from the responsible regulatory agency prior to commencing activities, if required. Engage the registered trapper(s).</p> <p>34. Breach the beaver dam slowly to avoid the rapid release of water that could cause flooding, fish entrapments and/or erosion of the bed and banks resulting in subsequent siltation of downstream waters.</p>
<i>Watercourse Crossing Plans</i>	<p>35. The Contractor shall develop a detailed site-specific watercourse crossing plan and submit the plan to the Company for approval prior to initiating watercourse crossing activities.</p>
<i>Instream Abandonment Activities</i>	<p>36. Complete activities in a timely manner. Before the commencement of instream activity, the Contractor will ensure that all necessary equipment and materials are available and are onsite.</p> <p>37. Remove all pipeline crossings as outlined in Table 3, if applicable, and in accordance with the typical and/or Project-specific drawings (Appendix 1D).</p> <p>38. Develop water quality monitoring plans to monitor for sediment events during instream activities, where required by the applicable regulatory approvals or as identified by an Aquatic Resource Specialist. If monitoring reveals sediment values are approaching threshold values, the water quality monitors will alert the Environmental Inspector(s) or designate(s) and work with them to develop corrective actions. If corrective actions are not successful, instream activities will be temporarily suspended until effective solutions are identified.</p> <p>39. The Contractor shall reduce the length of time of instream activity, the Contractor shall make every effort to complete all water crossing activities during the same working day.</p> <p>40. When implementing an instream excavation (i.e., open cut or isolated) method, and where practical, salvage the upper 0.5 m (minimum) of granular material if present. Stockpile separately from the remainder of the trench spoil so that the salvaged, native granular material can be used to cap the upper portion of the excavation.</p> <p>41. If spoil is likely to be highly saturated, excavate a pit or construct berms of packed earth to prevent spoil from flowing back into the watercourse. Locate containment berms and spoil outside of the 10 m riparian buffer area (Dwg. STDS-03-ML-05-131).</p> <p>42. Ensure that the hydraulic, fuel and lubrication systems of equipment working instream are in good repair.</p> <p>43. Ensure no vehicles or equipment, which contain petroleum, oil, or lubricants are parked or stationed in a watercourse at any time except for equipment that is required for that immediate phase of construction.</p>

Activity/Concern	Mitigation Measures
<i>Typical Open Cut Crossing Removal</i>	<p>44. Conduct typical open cut of seasonally dry or frozen to the bottom watercourses and drainages in accordance with applicable DFO <i>Measures to Protect Fish and Fish Habitat</i> and DFO <i>Standards and Code of Practice</i> (DFO 2019, 2021). Refer to Appendix 1D, Dwg. STDS-03-ML-05-105.</p> <p>45. Store excavation material outside the watercourse during the open cut.</p>
<i>Isolated Open-Cut Crossing Removal</i>	<p>46. Refer to Table 3 for locations where an isolated method is proposed. Refer to Appendix 1D, Dwgs. STDS-03-ML-05-111 and STDS-03-ML-05-112.</p> <p>47. Conduct isolated crossings of watercourses in accordance with applicable DFO <i>Measures to Protect Fish and Fish Habitat</i> and DFO <i>Standards and Code of Practice</i> (DFO 2019, 2021).</p> <p>48. Do not use earthen berms to isolate the crossing removal area.</p> <p>49. Ensure maintenance of downstream flow at all times when using an isolated method for crossing removal.</p> <p>50. Ensure water from flumes, dam and pumps, diversion or other methods do not cause erosion or introduce sediment into the channel.</p> <p>51. Follow design requirements of DFO <i>Interim Code of Practice: End-of-Pipe Fish Protection Screens</i> (DFO 2020). Ensure water and pump intakes avoid or reduce disturbance of the streambed and are screened with a maximum mesh size of 2.54 mm (0.1”). Screens should have a maximum approach velocity of 0.035 m/s (0.11 ft/s) where fish habitat is present, unless fish species-specific approach velocities are calculated by using the End-of-Pipe Screen Size Tool. Where pumps larger than 15 cm in diameter are used, place the intakes in a mesh cage (2.54 mm) to reduce the approach velocity that fish are exposed to, preventing them from being impinged on the intakes. Maintain the screens so they are free of debris. If a deeper sump is required for success of the isolated crossing, refer to Environmental Inspector(s) or designate(s).</p>
<i>Fish Salvage</i>	<p>52. Obtain the required permits for conducting fish salvage, prior to conducting instream work.</p> <p>53. The Contractor shall notify the Company 72 hours before any instream work for watercourse crossing removal or diversion to ensure fish salvage operations are conducted, where required.</p> <p>54. If an isolated method is employed, and where recommended by a qualified environmental professional, conduct a fish salvage led by an Aquatic Resource Specialist (i.e., Qualified Aquatic Environmental Specialist or provincial equivalent).</p> <p>55. Conduct fish salvage, in accordance with permit conditions, using appropriate methods and equipment. Release all captured fish to areas downstream of the crossing that provide suitable habitat.</p>
<i>Flood and Excessive Flow</i>	<p>56. Assess the capability to handle the expected flow rate with the proposed instream work.</p> <p>57. If use of the proposed instream work plan is determined to be feasible by the Company, the work will proceed.</p> <p>58. If use of the proposed instream work plan is determined to NOT be feasible by the Company due to excessive flows or flood conditions, follow the Flood and Excessive Flow Contingency Plan (Appendix 1E).</p>

Activity/Concern	Mitigation Measures
<i>Backfill Trench</i>	59. Place only imported clean coarse material (i.e., gravel or rock), or native material removed from the excavation/trench, as the final 0.5 m of backfill. Imported backfill material must be obtained from a Company approved off-site facility or source.
<i>Reclamation</i>	60. Return the bed and banks of each watercourse as close as possible to their original preconstruction contours. Do not realign or straighten watercourses or change their hydraulic characteristics. 61. Implement permanent bank reclamation measures to re-establish riparian vegetation and fish habitat as a part of backfill operations (Refer to Appendix 1D, Dwgs. STDS-03-ML-05-601, STDS-03-ML-05-602, STDS-03-ML-05-603, STDS-03-ML-05-604, STDS-03-ML-05-606 and STDS-03-ML-05-608). Biodegradable materials shall be utilized unless otherwise specified by the Company. 62. Seed disturbed banks and riparian areas with an approved native seed mixture and/ or cover crop as directed by the Environmental Inspector(s) or designate(s). The Environmental Inspector(s) or designate(s) will determine onsite whether other restoration methods need to be applied to stabilize banks (e.g., soil wraps, brush layers and matting).

TABLE 3 SUMMARY OF WATERCOURSES WITHIN 30 M OF PROGRAM COMPONENTS

Watercourse/Waterbody Name	Facility Type	Program Component	Latitude	Longitude	Fisheries Timing Window ^a	Fish Species Previously Documented ^b
Tributary to Smoke Lake 1 (TSL1)	Isolation Point	Bigstone Lateral	54.27593	-116.84637	February 1 to April 30	Longnose Sucker Pearl Dace White sucker
Tributary to Smoke Lake 2 (TSL2)	Isolation Point	Bigstone Lateral	54.27402	-116.80341	February 1 to April 30	Burbot Longnose Sucker Pearl Dace White sucker
Tributary to Smoke Lake 2 (TSL2)	Isolation Point	Bigstone Lateral	54.27386	-116.8026	February 1 to April 30	Burbot Longnose Sucker Pearl Dace White sucker
Tributary to Manatokan Lake (TML)	Isolation Point	Osborne Lake Lateral	54.50489	-111.02755	None	Brook stickleback Fathead Minnow
Birch Creek	Isolation Point	Ranfurly MS PTI	53.33954	-111.24205	None	Brook stickleback Fathead Minnow Lake Chub
Birch Creek	Isolation Point	Ranfurly MS PTI	53.33821	-111.24454	None	Brook stickleback Fathead Minnow Lake Chub
Carrot Creek	Isolation Point	Pioneer East Lateral	53.70262	-115.94736	September 16 to July 15	Arctic Grayling Brook trout Brown trout Brook stickleback Fathead minnow Lake Chub Longnose Dace Longnose Sucker Mountain Whitefish Northern Pike Rainbow Trout Spoonhead Sculpin Spottail Shiner White sucker
Sneddon Creek	Cathodic Protection Site	Silver Valley Lateral	56.03222	-119.48828	April 16 to July 15	Brook stickleback Flathead Chub Finescale Dace Lake Chub Longnose Dace Longnose Sucker Largescale Sucker Pearl Dace Yellow Perch
Egg Creek	Isolation Point	Ukalta Lateral	53.95685	-112.36019	None	Brook stickleback Fathead minnow Lake Chub Longnose Sucker White sucker

Notes:

^a Watercourse class and RAP determined from AENV (2006) and ESRD (2013).

^b Fish species previously documented were identified through the FWMIS (AEP 2023)

References:

Alberta Environment (AENV). 2006. Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body. Brooks Management Area Map.

Alberta Environment and Protected Areas (AEPA). 2023. Fisheries and Wildlife Management Information System. Accessed February 2023 from: https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub

Alberta Environment and Sustainable Resource Development (ESRD). 2013. Code of Practice for Pipelines and Telecommunication Lines Crossing a Waterbody. Consolidated to include amendments as of June 24, 2013. Alberta Queen's Printer, Edmonton, AB.

8.5 Pipeline and Facility Abandonment Activities (Excavating, Pipe Removal, Facility Removal, Cutting, Capping and Welding)

Introduction

The following environmental protection measures will be implemented during abandonment activities, including excavating, pipe removal, facility removal, cutting, capping and welding.

Objectives

The objectives of these environmental protection measures are to:

- prevent impacts to watercourses and waterbodies;
- reduce interference with other land uses; and
- prevent harming wildlife.

Activity/Concern	Mitigation Measures
<i>Wet Soils</i>	1. Implement the Wet Soils Contingency Plan (Appendix 1E), as required.
<i>Soil Pulverization</i>	2. Where pulverization of soils has the potential of causing soil loss or long-term structural impact, refer to the Soil Handling Contingency Plan (Appendix 1E).
<i>Excavation/ Trenching</i>	<p>3. To facilitate free movement of livestock and wildlife, follow excavation/trenching as closely as feasible with pipe removal and backfill, unless for Project purposes there is a need to have the excavation/trench open for an extended period of time.</p> <p>4. Minimize the amount of open excavations and/or trench at any one time.</p> <p>5. The Contractor will monitor the open excavation/trench for trapped wildlife. Should any wildlife be identified, the Contractor will contact the Environmental Inspector(s) or designate(s) and Construction Manager. The Environmental Inspector(s) or designate(s) will contact the responsible regulatory agency or a Wildlife Resource Specialist, where required, for direction.</p> <p>6. As excavation/trenching proceeds, identify areas of potential instability that may affect unstripped topsoil areas. Strip a wider area if there is sloughing into the excavation/trench and the potential for mixing of topsoil and subsoil exists. Back slope excavation/trench wall until stable.</p> <p>7. If unstripped topsoil is sloughing into the trench, suspend trenching operations until the topsoil is stripped wide enough to prevent loss.</p>
<i>Spoil Handling</i>	<p>8. Maintain adequate separation between topsoil and subsoil piles. If the potential for overlap is identified, move the topsoil, or in some space-restricted cases, protect with a geotextile cover. In non-agricultural areas, place spoil in a manner that the strippings pile can still be clearly identified.</p> <p>9. Where abandonment activities occur under frozen conditions, do not mix snow with spoil material.</p>

Activity/Concern	Mitigation Measures
<i>Excavation/Trench Water Management</i>	10. Monitor water levels in all open trenches. 11. Where practical, grade the Project footprint to divert surface water away from the open excavation/trench. 12. Where the open trench has the potential to dewater a wetland, undertake trenching in a manner that prevents the flow of water along the trench.
<i>Welding and Cutting Waste</i>	13. Collect shavings continuously as beveling proceeds. Collect all welding and cutting refuse generated by each activity and dispose of at an approved waste facility.
<i>Pipeline Cleaning</i>	14. Purge and clean the pipeline segments to be abandoned prior to isolation or other physical abandonment activities. In the event of a spill, refer to the Release Contingency Plan (Appendix 1E).
<i>Coating</i>	15. Where spray or paint-on coatings are applied, use a tarp or alternative device of sufficient size to block over spray from contacting the ground. Clean-up any over spray that comes in contact with the ground.
<i>Fencing</i>	16. All facility site fencing removed for abandonment activities will be stockpiled on site and hauled away except for fencing required to protect facilities left in place.
<i>Yard Gravel</i>	17. Strip and stockpile all yard gravel removed from the Project site except for gravel that is required for facilities left in place. 18. Yard gravel identified as contaminated will be stockpiled separately and disposed of at an approved waste handling facility.
<i>Meter Station Building and Associated Infrastructure</i>	19. Cleaning, testing and removal of valves, meter station buildings and associated infrastructure will be done in accordance with the TC Energy Environmental Management of Industrial and Hazardous Waste Standards (CAN).

8.6 Backfill

Introduction

The following environmental protection measures will be implemented during backfill operations.

Objectives

The objectives of these environmental protection measures are to:

- protect the facilities left in place and prevent subsidence of the excavations and/or trench;
- ensure excavated materials are replaced and properly compacted; and
- properly re-establish surface and subsurface drainage.

Activity/Concern	Mitigation Measures
<i>Padding</i>	<ol style="list-style-type: none"> 1. Do not use topsoil/strippings as backfill under any circumstances. 2. Where sand padding has been employed on agricultural land resulting in excess spoil, remove the displaced spoil that cannot be adequately feathered out on the Project footprint to an approved location.
<i>Rock In Backfill</i>	<ol style="list-style-type: none"> 3. Do not backfill large rocks into the upper 0.5 m of the excavation on agricultural lands. 4. Pick all rocks greater than 10 cm in width in the top 30 cm of subsoil and remove from the Project footprint, unless otherwise directed by the Environmental Inspector(s) or designate. On forested land, rock and root picking will be in accordance with landowner or regulatory agency guidance.
<i>Backfill Excavation/ Trench</i>	<ol style="list-style-type: none"> 5. In agricultural areas, avoid scalping the sod layer in pasture and hay land during backfill. 6. Backfill the excavation/trench as soon as practical to minimize hazards to wildlife. 7. Place spoil back into the excavation/trench in such a way as to prevent loss or mixing of topsoil/strippings. 8. Backfill the clay or subsoil first, if salvaged separately from topsoil in shallow muskeg or peaty areas.
<i>Winter Activities</i>	<ol style="list-style-type: none"> 10. Do not mix snow with spoil material during backfill. 11. To reduce the potential for subsidence, roach all available spoil over the excavation/trench to allow for settlement. If necessary, rework spoil material to break-up frozen clumps prior to backfilling. 12. Do not attempt to compact excavation/trench material until it has completely thawed. 13. Leave openings in the trench crown and all windrows, if applicable, at appropriate locations to allow for temporary and permanent cross drainage. 14. Ensure that all backfill is complete prior to spring break-up, unless otherwise authorized by the Company.
<i>Excavation/Trench Compaction – Non- Frozen Conditions</i>	<ol style="list-style-type: none"> 15. In agricultural areas, backfill excavation/trench material in lifts and compact after each lift. 16. Return all excavated material back into the excavation/trench.

8.7 Clean-Up and Reclamation

Introduction

Clean-up and reclamation are important steps in returning abandoned sites to a condition which meets the relevant reclamation criteria and equivalent land capability. For winter activities on Crown non-agricultural lands, clean-up is generally a two-phase process, with machine clean-up being completed immediately following abandonment activities, and final clean-up occurring the following winter, or as soon as conditions permit. For winter activities within freehold and designated Crown agricultural lands, clean-up is also generally a two-phase process, with machine clean-up being completed immediately following abandonment activities, and final clean-up occurring the following summer, or as soon as conditions permit. For summer abandonment activities, clean-up is generally completed immediately following abandonment activities, or as soon as conditions permit.

Objectives

The objectives of these environmental protection measures are to:

- effectively use reclamation techniques that prevent topsoil/strippings loss from wind and water erosion;
- establish a vegetative cover compatible with surrounding vegetation and land uses;
- comply with approval conditions, including permits and landowner commitments;
- re-establish the Project footprint to a stable condition; and
- maintain equivalent land capability, ensuring the ability of the land to support various land uses similar to the uses that existed before construction, but not necessarily identical.

Activity/Concern	Mitigation Measures
<i>Clean-Up Schedule</i>	<ol style="list-style-type: none"> 1. Machine clean-up activities will follow completion of abandonment activities as closely as feasible. 2. If machine clean-up cannot be completed prior to spring break-up, ensure cross drainage is re-established, and sedimentation and erosion controls are installed to protect the Project footprint and sensitive environmental features. Final clean-up and reclamation will generally occur during the following fall and/or winter, or as soon as conditions permit. 3. In freehold and designated crown agricultural lands, schedule final clean-up to occur under non-frozen conditions when soil moisture conditions permit. 4. If reclamation is postponed, contact the relevant regulatory agencies and landowners before the initiation of the reclamation activities and notify upon completion, as required.
<i>Schedule – Migratory Birds</i>	<ol style="list-style-type: none"> 5. In the event clean-up activities are scheduled to occur within the Primary Nesting Period for the Bird Conservation Region for migratory birds, refer to the Breeding Bird and Nest Management Plan (Appendix 1F).
<i>Level of Clean-up</i>	<ol style="list-style-type: none"> 6. The level of clean-up on all lands will ensure equivalent land capability is maintained.
<i>Staking</i>	<ol style="list-style-type: none"> 7. Remove all flagging and signage from the Project area and dispose of it appropriately following the completion of abandonment activities.
<i>Matting</i>	<ol style="list-style-type: none"> 8. Remove all matting, geotextile and other materials from all locations on the Project footprint following clean-up, once site conditions are deemed stable.
<i>Wet Soils</i>	<ol style="list-style-type: none"> 9. If saturated conditions exist at the time of clean-up, refer to the Wet Soils Contingency Plan (Appendix 1E). If necessary, suspend final clean-up activity until soil conditions are appropriate.

Activity/Concern	Mitigation Measures
<i>Secondary Stripping (Agricultural Land)</i>	<ul style="list-style-type: none"> 10. Where activities occurred during frozen ground conditions, and where reduced width topsoil stripping was conducted, final clean-up will require stripping of a wider area (secondary stripping) to maintain land capability. 11. Strip back topsoil on both sides of the excavation/trench to ensure sufficient space is available for excavation/trench compaction, feathering excess soil, and subsoil preparation. 12. Once subsoil preparation is complete, replace topsoil uniformly over the stripped area.
<i>Grade Replacement</i>	<ul style="list-style-type: none"> 13. Replace grade material to adjacent land contours, except if otherwise authorized by the Environmental Inspector(s) or designate(s). 14. Re-establish surface drainage patterns; install drainage and erosion control measures, and complete the installation of sedimentation control measures at all watercourse crossings.
<i>Grade Replacement – Frozen Conditions</i>	<ul style="list-style-type: none"> 15. Where abandonment activities occur under frozen conditions, replace grades, unless otherwise approved by the Company. Some regrading under non-frozen conditions may be required to touch-up areas and to ensure pre-disturbance contours are maintained.
<i>Compacted Subsoils</i>	<ul style="list-style-type: none"> 16. Environmental Inspector(s) or designate(s) will determine the locations where subsoil compaction is an issue. Prior to topsoil/strippings replacement, rip compacted subsoils on the Project footprint with a multi-shank ripper or breaking disc to a depth of compaction. If soils are moist, postpone ripping of subsoils until soils dry to ensure that the soils fracture when ripped. 17. In areas where the topsoil is in place, use special equipment such as a paratiller to relieve compaction with reduced potential for admixing at the discretion of the Environmental Inspector(s) or designate(s) in consultation with the Construction Manager.
<i>Subsoil Preparation</i>	<ul style="list-style-type: none"> 18. Re-grade areas with vehicle ruts or erosion gullies. 19. Smooth and level the ripped subsoil surface to prevent admixing of subsoil and topsoil/strippings during replacement.
<i>Excavation/Trench Compaction</i>	<ul style="list-style-type: none"> 20. Where excavation/trenching has been conducted under frozen ground conditions, delay final excavation/trench compaction until the subsoil has completely thawed. 21. In agricultural areas, backfill excavation/trench material in lifts and compact after each lift. 22. Return all excavated material back into the excavation/trench.
<i>Root and Rock Picking</i>	<ul style="list-style-type: none"> 23. On freehold or designated crown agricultural lands, pick rocks and roots to an equivalent size and distribution of that on adjacent land, unless otherwise directed by the Environmental Inspector(s) or designate(s). 24. Dispose of all rock material collected at an appropriate location off of the Project footprint, as directed by the Environmental Inspector(s) or designate(s).
<i>Topsoil/Strippings Replacement</i>	<ul style="list-style-type: none"> 25. Replace topsoil/strippings to a uniform depth, on all portions of the Project footprint that were stripped. Match topsoil/strippings depth to the unstripped edges of the Project footprint. 26. On freehold or designated crown agricultural lands, if abandonment activities occur under frozen ground conditions, delay topsoil/strippings replacement until the topsoil/strippings pile and excavation/trench spoil has completely thawed. 27. Postpone replacement of topsoil/strippings during wet weather or high winds to prevent erosion and/or damage to the soil structure.

Activity/Concern	Mitigation Measures
<i>Cultivation</i>	<p>28. On agriculture land, disc or cultivate the areas on which topsoil has been replaced to restore soil tilth, unless otherwise approved by the Environmental Inspector(s) or designate(s). Cultivation depth will not exceed the topsoil depth.</p> <p>29. Under extremely dry soil conditions use a cultivator, rather than a disc.</p>
<i>Access Removal</i>	<p>30. Remove bar ditch ramps and reclaim all temporary access trails and shoo-flies to stable conditions. Re-contour to pre-disturbance conditions and seed accordingly.</p> <p>31. Remove all mats and ramps used so that they do not impede the restoration of natural drainage patterns.</p> <p>32. Remove all temporary vehicle crossing structures. Ensure that removal of access does not disturb the bed or banks at the crossing.</p>
<i>Access Removal – Frozen Conditions</i>	<p>33. Remove all temporary vehicle crossing structures, prior to spring break-up. Remove or breach snow or ice bridges to ensure they do not impede flow, unless otherwise approved by the Company.</p>
<i>Cover Crop</i>	<p>34. Use a cover crop to assist in weed and erosion control where warranted, or where requested by the landowner. Apply cover crops to the approach slopes of all water crossings where there is a risk of wind and water erosion.</p>
<i>Seeding and Re-vegetation</i>	<p>35. Use only Certified No. 1 seed, unless Certified No. 1 is not available for select reclamation seed species (<i>i.e.</i>, native species).</p> <p>36. Certificates of Analysis for all components of seed mixes and cover crops shall be reviewed by the Company. Individual seed components shall not be used or blended to specified mixes until approval is provided by the Company.</p> <p>37. Seeding will follow as close as possible to final clean-up and topsoil/strippings replacement pending seasonal or weather conditions.</p> <p>38. On privately-owned lands such as pasture and hay land, base the final seed mix on input from landowners and the availability of seed at the time of reclamation.</p> <p>39. Landowners are responsible for seeding cultivated lands.</p> <p>40. Natural recovery is the preferred method of reclamation in non-agricultural areas on level terrain where erosion is not expected. Where natural recovery is not preferred, seed disturbed areas as per site requirements and as specified by the Environmental Inspector(s) or designate(s).</p> <p>41. Seed riparian and erosion prone areas with a cover crop and/or seed mix that has been approved by the responsible regulatory agency and/ or landowner as soon as feasible after abandonment activities, prior to spring freshet wherever possible.</p> <p>42. Use natural recovery in wetlands unless otherwise specified by the Company.</p> <p>43. Restrict vehicle access over newly seeded areas.</p>
<i>Seed Mix Application</i>	<p>44. Use broadcast application on steep terrain, forested areas, fence lines, road ditches, watercourse banks, etc.</p> <p>45. Apply seed at a rate of 8-14 kg/ha for drill seeding and 15-35 kg/ha for broadcast seeding. Drill seeding is the primary method of seed application in freehold and designated crown agricultural lands, unless otherwise specified by the Environmental Inspector(s) or designate(s).</p>

Activity/Concern	Mitigation Measures
<i>Sedimentation / Erosion Control</i>	<p>46. Remove unnecessary silt fence or other temporary erosion control measures not required, as specified by the Environmental Inspector(s) or designate(s).</p> <p>47. Install permanent sedimentation and erosion control measures, where required, in accordance with Dwgs. STDS-03-ML-05-001, STDS-03-ML-05-132, STDS-03-ML-05-603, STDS-03-ML-05-604, STDS-03-ML-05-606 and STDS-03-ML-05-608 in Appendix 1D, unless otherwise approved by the Environmental Inspector(s) or designate(s) to adjust for site conditions and suitability.</p> <p>48. The Environmental Inspector(s) or designate(s) will determine the location of sedimentation and erosion control measures.</p> <p>49. Install cross ditches and berms on moderately steep and steep slopes on pasture, bush and forested lands in order to prevent runoff along the right-of-way and subsequent erosion. Install berms in accordance with the typical drawings (Appendix 1D, Dwgs. STDS-03-ML-12-221 or STDS-03-ML-12-222).</p> <p>50. Biodegradable materials shall be utilized for installation of permanent sedimentation and erosion control measures, unless otherwise specified by the Company.</p>
<i>Straw Crimping</i>	<p>51. Straw crimping may be used to prevent wind erosion and reduce evapotranspiration on pasture, cultivated lands, and erosion prone soils as specified by the Environmental Inspector.</p> <p>52. To prevent the introduction or spread of regulated weeds, inspect all potential source locations for regulated weeds before procurement of the straw.</p>
<i>Rollback</i>	<p>53. Install rollback as specified by the Environmental Inspector(s) or designate(s) and approved by the responsible regulatory agency or the landowner.</p> <p>54. Rollback slash and small diameter, non-merchantable timber on erosion prone slopes. Walk down erosion control rollback with a dozer (Refer to Appendix 1D, Dwg. STDS-03-ML-05-313).</p> <p>55. Install rollback to prevent access along portions of the Project footprint as directed by the Environmental Inspector(s) or designate(s). Spread evenly over the Project footprint. Do not walk over access control rollback (Refer to Appendix 1D Dwg. STDS-03-ML-05-312).</p>
<i>Tackifiers</i>	<p>56. The Environmental Inspector(s) or designate(s) will determine locations where tackifier will be used, if required.</p> <p>57. Review areas where tackifier has been applied and other potential erosion areas to ensure soils stabilization is effective where topsoil piles/windrows are left in place through winter activities and spring thaw. Follow-up monitoring and applications will be conducted as required.</p>
<i>Fencing</i>	<p>58. Install fencing to exclude livestock where required. Discuss fencing options with landowners and occupants.</p> <p>59. All fences will be replaced and will match the number of wires in the connecting fence line.</p> <p>60. New posts and bracing will be installed to match the connecting fence.</p>
<i>Burn Piles</i>	<p>61. Confirm burn piles are properly extinguished. Conduct infrared scanning of burn pile locations to locate any hot spots.</p>
<i>Weed Control</i>	<p>62. Implement post-abandonment reclamation monitoring and apply mitigations for any locations identified as having listed weed infestations according to applicable regulatory requirements, as identified in the list of Project-specific mitigation measures (Table 2).</p>

9.0 POST-ABANDONMENT RECLAMATION MONITORING

Objectives

The objectives of the reclamation and reclamation monitoring program are to:

- assess the success of environmental protection measures implemented during meter station and pipeline abandonment activities;
- document opportunities for procedural learnings and improvement; and
- review the success of re-establishing equivalent land capability.

Process

Reclamation monitoring for the Project will follow the principles of the Company's post-abandonment monitoring program which ensures compliance with specific reclamation performance expectations and applicable regulatory requirements. Mitigation methods will be based on the principle that success of land reclamation is measured against adjacent representative site conditions while taking into consideration the status of reclamation at the time of assessment.

Preliminary assessments of disturbed areas are conducted during the most appropriate time of the season, which depends on the various biophysical resources and their growth stage or life cycle. This is usually in the spring/summer and involves identifying deficiencies and proposing recommendations for corrective actions.

Reclamation monitoring may entail other specifically-designed evaluation criteria, depending on the concerns and issues that were highlighted through Project-specific environmental documents, or encountered during the abandonment activities. This includes measurable parameters that will be recorded and compared to representative control areas to measure reclamation success.

Deficiencies discovered or opportunities for enhancement will result in developing proposed recommendations for corrective actions. The remedial actions are to be implemented as soon as practical during the most appropriate season, preferably summer, but may be outside of this period due to environmental timing restrictions (reproductive periods and migration periods), field and weather conditions or social and public concerns. A final assessment would then be scheduled as deemed appropriate to ensure that the remedial actions are stable and successful.

Areas that do not meet equivalent land capability for items such as landscape features, vegetation establishment, soils and reclamation success will be identified and records will be maintained for remedial measures implemented, the success of these measures and to ensure that outstanding issues are investigated and resolved.

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APPENDIX 1A
EMERGENCY CONTACTS

Contact	Contact Information
RCMP	911
Ambulance	911
Hospital	911
Fire	911
Alberta Energy and Environmental 24-Hr Response Line (In the Event of a Release)	1-800-222-6514
Alberta Forest Fire Reporting	310-3473
Environment and Climate Change Canada – Paul Gregoire	780-951-8695 paul.gregoire@canada.ca
DFO Fisheries Protection – Alberta	1-855-852-8320 FisheriesProtection@dfo-mpo.gc.ca
Provincial Wildlife Biologist	See Fish and Wildlife Representatives in Appendix 1B
Provincial Forest/Land Officer	See Public Lands Representatives in Appendix 1B
TC Energy Canadian Regulatory Compliance 24-Hr Incident Response Line (Calgary)	403-920-7723
Canada Energy Regulator (Calgary)	403-299-2773
Transportation Safety Board 24-Hr Pipeline Emergency Response Line (Calgary)	1-819-997-7887

APPENDIX 1B

CONTACTS

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Curtis Campbell Partner in Charge ERM Consultants Canada Ltd. 700 2 St SW #2250 Calgary, AB T2P 2W1 Phone: 403-472-4266 Email: curtis.campbell@erm.com	(Environmental Resource Specialist)
Narges Boroujerdi Project Manager ERM Consultants Canada Ltd. 700 2 St SW #2250 Calgary, AB T2P 2W1 Phone: 403-407-2684 Email: narges.boroujerdi@erm.com	(Environmental Consultant)
Canada Energy Regulator 210, 517 10 Ave SE Calgary, Alberta T2R 0A8 Phone: 403-292-4800 or 1-800-899-1265 (toll-free)	(Canada Energy Regulator Contact)
Paul Gregoire Manager Regulatory Affairs ECCC – Canadian Wildlife Service Prairie Region Eastgate Offices, 9250 – 49 th Street Edmonton, Alberta T6B 1K5 Phone: 780-951-8695 Email: paul.gregoire@canada.ca	(General Environment and Climate Change Canada Contact)
DFO Triage Fisheries Protection Program Figures and Oceans Canada 867 Lakeshore Road Burlington, Ontario L7S 1A1 Phone: 1-855-852-8320 Email: FisheriesProtection@dfo-mpo.gc.ca	(DFO Representative: Notify in event that Contingency Water Crossing Measures or Emergency Works are to be implemented)

Darryl Bereziuk
Director, Archaeological Survey Section
Culture
8820 112 St NW
Edmonton, Alberta T2G 2P8
Phone: 780-431-2316
Fax: 780-427-3956
Email: darryl.bereziuk@gov.ab.ca

(In Case of Discovery of Archaeological,
Palaeontological or Historical Site)

Christopher Grainger
Senior Lands Officer
Alberta Environment and Parks
Lands Management – Peace Region
Bag 900-04, Room 115, Provincial Bldg, 9621 96 Ave
Peace River, Alberta T8S 1T4
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(Public Lands Representative - Peace
Region – Peace River)

Robert Weber
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Box 149, 2nd Floor, Provincial Bldg, 5226 53 Ave
High Prairie, Alberta T0G 1E0
Phone: 780-523-6567
Email: robert.weber@gov.ab.ca

(Public Lands Representative – Peace
Region – High Prairie)

Edward (Bobby) Evenson
Lands Officer
100, Agriculture Centre, 5401 1 Ave South
Lethbridge, AB T1J 4V6
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Email: edward.evenson@gov.ab.ca

(Public Lands Representative – South
Saskatchewan Region – Lethbridge)

Mike Thompson
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David Geddes
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1st Floor, Provincial Bldg, 5020 52 Ave
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(Public Lands Representative – Upper
Athabasca Region– Whitecourt)

Neil Timm
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2nd Floor, 8503 Beaverhill Road
Lac La Biche, Alberta T0A 2C0
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Email: neil.timm@gov.ab.ca

(Public Lands Representative – Lower
Athabasca Region– Lac La Biche)

Jeffrey Simpkins
Lands Officer
Box 35, 3rd Floor, Provincial Bldg, 9915 Franklin Ave
Fort McMurray, Alberta T9H 2K4
Phone: 780-788-6423
Email: jeffrey.simpkins@gov.ab.ca

(Public Lands Representative – Lower
Athabasca Region– Fort McMurray)

Alberta Environment and Parks
Fish and Wildlife - Peace Region - Manning
420 2 St SW
Manning, Alberta T0H 2M0
Phone: 780-836-3065

(Fish and Wildlife Representative – Peace
Region – Manning))

Alberta Environment and Parks
Fish and Wildlife – Peace Region – Valleyview
2nd Floor, 5112 50 Avenue
Valleyview, Alberta T0H 3N0
Phone: 780-524-3605

(Fish and Wildlife Representative – Peace
Region – Valleyview)

Alberta Environment and Parks
Fish and Wildlife – Red Deer/North Saskatchewan –
Drumheller
Main Floor, 201 Centre Street
Drumheller, Alberta T0J 0Y0
Phone: 403-823-1670

(Fish and Wildlife Representative – Red
Deer/ North Saskatchewan – Drumheller)

Alberta Environment and Parks
Fish and Wildlife – Upper Athabasca Region – Whitecourt
5020 52 Ave
Whitecourt, Alberta T7S 1N2
Phone: 780-778-7112

(Fish and Wildlife Representative – Upper
Athabasca – Whitecourt)

Alberta Environment and Parks
Fish and Wildlife – Peace Region – Spirit River
Main Floor, 4602 50 St
Spirit River, Alberta T0G 3G0
Phone: 780-864-4101

(Fish and Wildlife Representative – Peace
Region – Spirit River)

Alberta Environment and Parks
Fish and Wildlife – Lower Athabasca Region – Lac La
Biche
2nd Floor, 530 8 St
Lac La Biche, Alberta T0A 2C0
Phone: 780-623-5247

(Fish and Wildlife Representative – Lower
Athabasca – Lac La Biche)

Alberta Environment and Parks
Fish and Wildlife – Lower Athabasca Region – Fort
McMurray
3rd Floor, 9915 Franklin Ave
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Phone: 780-743-7200

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Athabasca – Fort McMurray)

APPENDIX 1C

ALBERTA STANDARD PERMIT LIST

FEDERAL Approval / Permit

SARA Permit for any activity affecting a *Species at Risk Act* listed species, any part of its critical habitat, or the residence of one or more individuals of a listed species
 Leave to Abandon
 Section 241 Order
Canadian Navigable Waters Act approval (vehicle crossings of all navigable watercourses or pipeline crossings of large watercourses only)
 Authorization under Section 35 under the *Fisheries Act*

Issuing Agency

ECCC
 CER
 TC (CER)
 DFO (CER)

ALBERTA Permit/License

Surface Rights:
 TFA (Temporary Field Authorization) – AEPA
 Master Land Withdrawal and Consent Agreement – FMA Holder

Issuing Agency

AEPA
 FMA Holder

Water:

Notification under the *Water (Ministerial) Regulation* and the *Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body*
 Notification under the *Code of Practice for Watercourse Crossings*
 Approval under the *Water Act and Water (Ministerial) Regulation*
 Temporary diversion licence under the *Water (Ministerial) Regulation* and the *Code of Practice for Diversion of Water for Hydrostatic Testing of Pipelines*

AEPA

Fish/Wildlife & Other:

Fish Collection Permit (for salvage of fish)
 Damage Control Licence (for beaver and beaver dam removal)
Historical Resources Act Clearance
 Burning Permit

AEPA
 AEPA
 AC
 LFD/CTY/MD

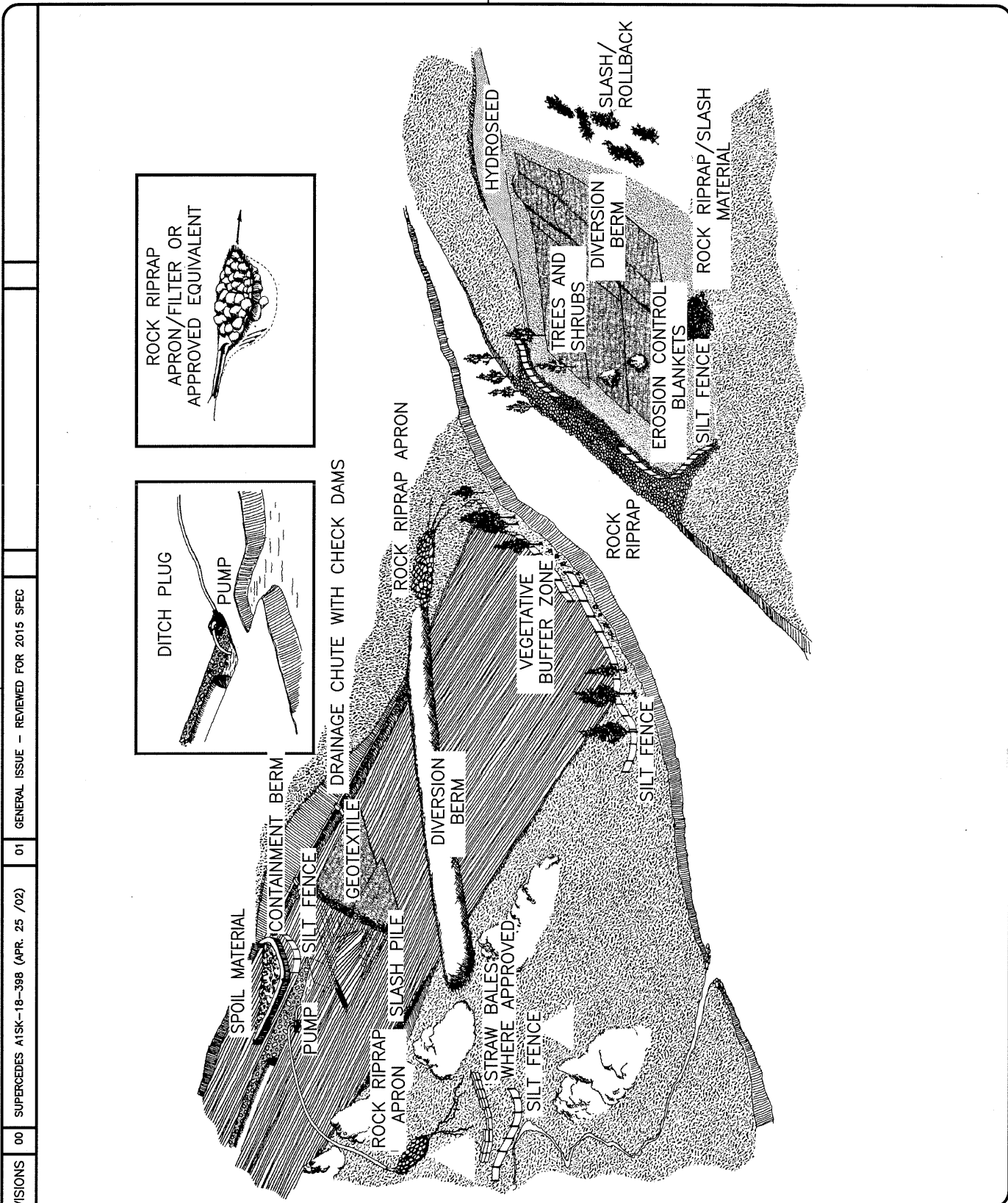
AEPA	=	Alberta Environment and Protected Areas
AT	=	Alberta Transportation
CER	=	Canada Energy Regulator
AC	=	Alberta Culture
CTY	=	e.g., County of Northern Lights
DFO	=	Fisheries and Oceans Canada
ECCC	=	Environment and Climate Change Canada
F&W	=	Fish and Wildlife, Alberta Environment and Protected Areas
FMA Holder	=	Forest Management Agreement (e.g., Mercer Peace River Pulp Ltd.)
LFD	=	Public Lands and Forests Division, Alberta Environment and Protected Areas
MD	=	e.g., Municipal District of Greenview No. 16
TC	=	Transport Canada

APPENDIX 1D**TYPICAL DRAWINGS**

<u>Drawing Number</u>	<u>Rev</u>	<u>Drawing Title</u>
STDS-03-ML-05-001	01	Typical Erosion and Sediment Control Measures
STDS-03-ML-05-002	00	Wetland Mitigation Open Water Crossing (Sheet 1 of 2)
STDS-03-ML-05-003	00	Wetland Mitigation Open Water Crossing (Sheet 2 of 2)
STDS-03-ML-05-004	00	Wetland Mitigation Typical Crossing (Sheet 1 of 2)
STDS-03-ML-05-005	00	Wetland Mitigation Typical Crossing (Sheet 2 of 2)
STDS-03-ML-05-006	00	Peatland Materials Conservation Trench Spoil 2 Lift (Sheet 1 of 2)
STDS-03-ML-05-007	00	Peatland Materials Conservation Trench Spoil 2 Lift (Sheet 2 of 2)
PBAS-03-ML-05-101	00	Temporary Clear Span Crossings (Sheet 1 of 3)
PBAS-03-ML-05-102	00	Temporary Clear Span Crossings (Sheet 2 of 3)
PBAS-03-ML-05-103	00	Temporary Clear Span Crossings (Sheet 3 of 3)
STDS-03-ML-05-103	01	Pipeline Vehicle Crossing – Culvert with Native Fill Material (Sheet 1 of 2)
STDS-03-ML-05-103	01	Pipeline Vehicle Crossing – Culvert with Native Fill Material (Sheet 2 of 2)
PBAS-03-ML-03-008	00	Temporary Snowfill/Ice Bridge Crossing
STDS-03-ML-05-105	00	Typical Open Cut Watercourse Crossings (Sheet 1 of 2)
STDS-03-ML-05-105	00	Typical Open Cut Watercourse Crossings (Sheet 2 of 2)
STDS-03-ML-05-111	01	Flume Water Course Crossings (Sheet 1 of 3)
STDS-03-ML-05-111	01	Flume Water Course Crossings (Sheet 2 of 3)
STDS-03-ML-05-111	01	Flume Water Course Crossings (Sheet 3 of 3)
STDS-03-ML-05-112	01	Dam and Pump Water Course Crossings (Sheet 1 of 3)
STDS-03-ML-05-112	01	Dam and Pump Water Course Crossings (Sheet 2 of 3)
STDS-03-ML-05-112	01	Dam and Pump Water Course Crossings (Sheet 3 of 3)
STDS-03-ML-05-113	01	Dragline Typical Water Course Crossings
STDS-03-ML-05-131	01	Soil Retaining Berm
STDS-03-ML-05-132	01	Sediment Control – Silt Fence Construction
STDS-03-ML-05-137	01	Sediment Control – Check Dam/Filter
STDS-03-ML-05-301	01	Timber Salvage Quality and Defects
STDS-03-ML-05-302	01	Salvage of Merchantable Timber
PBAS-03-ML-05-312	01	Typical Rollback for Access Control
STDS-03-ML-05-313	01	Typical Rollback for Erosion Control
STDS-03-ML-05-314	00	Mounding and Habitat Restoration (Sheet 1 of 2)
STDS-03-ML-05-315	00	Mounding and Habitat Restoration (Sheet 2 of 2)
STDS-03-ML-05-316	00	Habitat Restoration Seedling Planting for Line of Sight (Sheet 1 of 3)
STDS-03-ML-05-317	00	Habitat Restoration Seedling Planting (Sheet 2 of 3)
STDS-03-ML-05-318	00	Habitat Restoration and Line of Sight Seedling Planting Notes (Sheet 3 of 3)
STDS-03-ML-05-401	01	Topsoil Conservation – Full-Width Stripping (Sheet 1 of 2)
STDS-03-ML-05-401	01	Topsoil Conservation – Full-Width Stripping (Sheet 2 of 2)
STDS-03-ML-05-402	02	Topsoil Conservation – Ditchline and Spoil Side
STDS-03-ML-05-404	01	Topsoil Conservation – Blade Width
STDS-03-ML-05-410	00	Topsoil Conservation – Ditch and Workside Stripping (Sheet 1 of 2)
STDS-03-ML-05-410	00	Topsoil Conservation – Ditch and Workside Stripping (Sheet 2 of 2)
STDS-03-ML-05-411	01	Topsoil Conservation – Ditchline (Winter Construction) (Sheet 1 of 2)
STDS-03-ML-05-411	01	Topsoil Conservation – Ditchline (Winter Construction) (Sheet 1 of 2)
STDS-03-ML-05-412	01	Topsoil Conservation – Foreign Pipeline Crossings (Winter Construction) (Sheet 1 of 2)
STDS-03-ML-05-412	01	Topsoil Conservation – Foreign Pipeline Crossings (Winter Construction) (Sheet 2 of 2)
STDS-03-ML-05-421	01	Topsoil Conservation for Side Hill Grading in Agriculture Land
STDS-03-ML-05-424	01	Soil Handling for Ramped Line Crossing (Sheet 1 of 2)
STDS-03-ML-05-424	01	Soil Handling for Ramped Line Crossing (Sheet 2 of 2)
STDS-03-ML-05-426	00	Topsoil Conservation – Full-Width Stripping 3 Lift (Sheet 1 of 2)
STDS-03-ML-05-426	00	Topsoil Conservation – Full-Width Stripping 3 Lift (Sheet 2 of 2)

STDS-03-ML-05-431	01	Secondary Stripping for Spoil Displacement (Sheet 1 of 2)
STDS-03-ML-05-431	01	Secondary Stripping for Spoil Displacement (Sheet 2 of 2)
STDS-03-ML-05-443	01	Grubbing and Topsoil Conservation for Treed Land (Sheet 1 of 2)
STDS-03-ML-05-443	01	Grubbing and Topsoil Conservation for Treed Land (Sheet 2 of 2)
STDS-03-ML-05-445	00	Frozen Forested Lands Right-of-Way Preparation (Minimal Surface Disturbance)
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STDS-03-ML-05-602	01	Streambank Reclamation – Deflectors
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STDS-03-ML-05-604	01	Streambank Reclamation – Brush Layer in Cross Cut Slope
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STDS-03-ML-12-211	01	Typical Subdrain Using Gravel (Sheet 1 of 3)
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STDS-03-ML-12-221	01	Typical Diversion Berms (Sheet 2 of 2)
STDS-03-ML-12-222	01	Typical Diversion Berms with Flow Channel (Sheet 1 of 2)
STDS-03-ML-12-222	01	Typical Diversion Berms with Flow Channel (Sheet 2 of 2)
STDS-03-ML-12-223	01	Typical Stub Berm
STDS-03-ML-03-214	02	Drain Tile Restoration
STDS-03-LA-SK-001	00	Typical Horizontal Directional Drill
PBAS-03-ML-05-001	00	Corduroy/Mat Wetland Crossing

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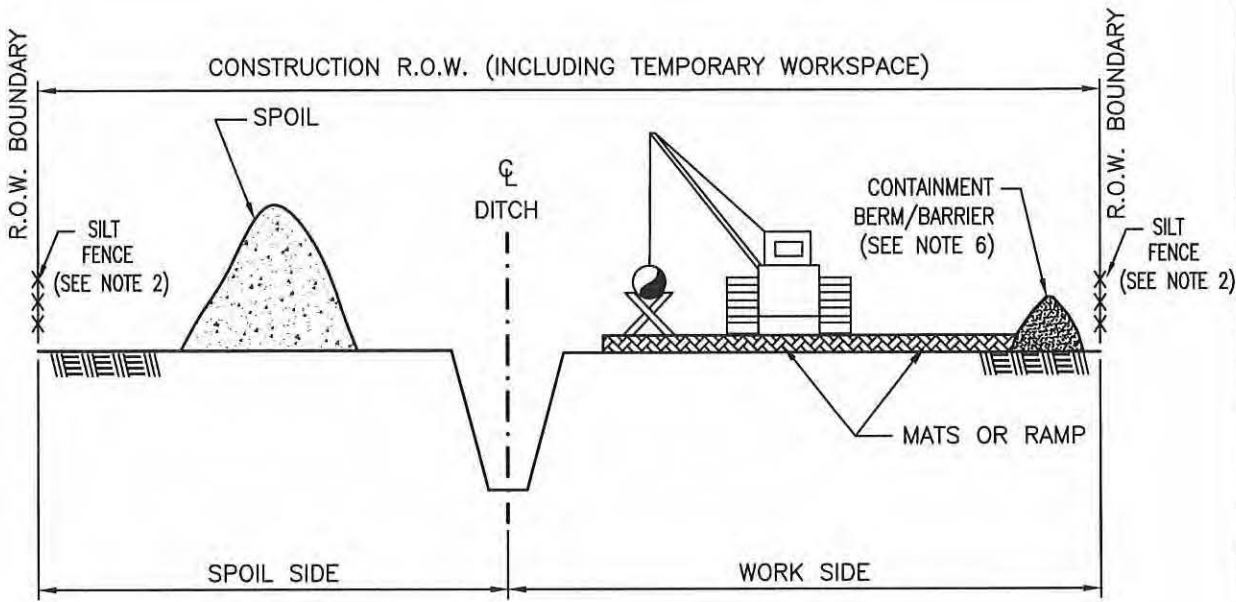


REVISIONS	00	SUPERCEDES A1SK-18-398 (APR. 25 /02)	01	GENERAL ISSUE - REVIEWED FOR 2015 SPEC
		DESIGNER:	DESIGN STANDARD	
		FIA # STDS CHAINAGE: DISCIPLINE # 03	TITLE: TYPICAL EROSION AND SEDIMENT CONTROL MEASURES	
NAME: DATE:		CHECKED BY:	DESIGN CHECKER:	SCALE N.T.S. DWG No STDS-03-ML-05-001 REV 01

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DESIGNFILE-----



CROSS SECTION VIEW

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TIME
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	DESIGNER: <i>Dausky B</i> May 30 2018 <small>NAME DATE</small>	DESIGN STANDARD		
	CHECKED BY: <i>AK</i>	DESIGN CHECKER: <i>MPS</i>	FIA # STDS CHAINAGE: DISCIPLINE # 03	TITLE WETLAND MITIGATION OPEN WATER CROSSING (SHEET 1 OF 2)
SCALE N.T.S.		DWG No STDS-03-ML-05-002	REV 00	

NOTES:

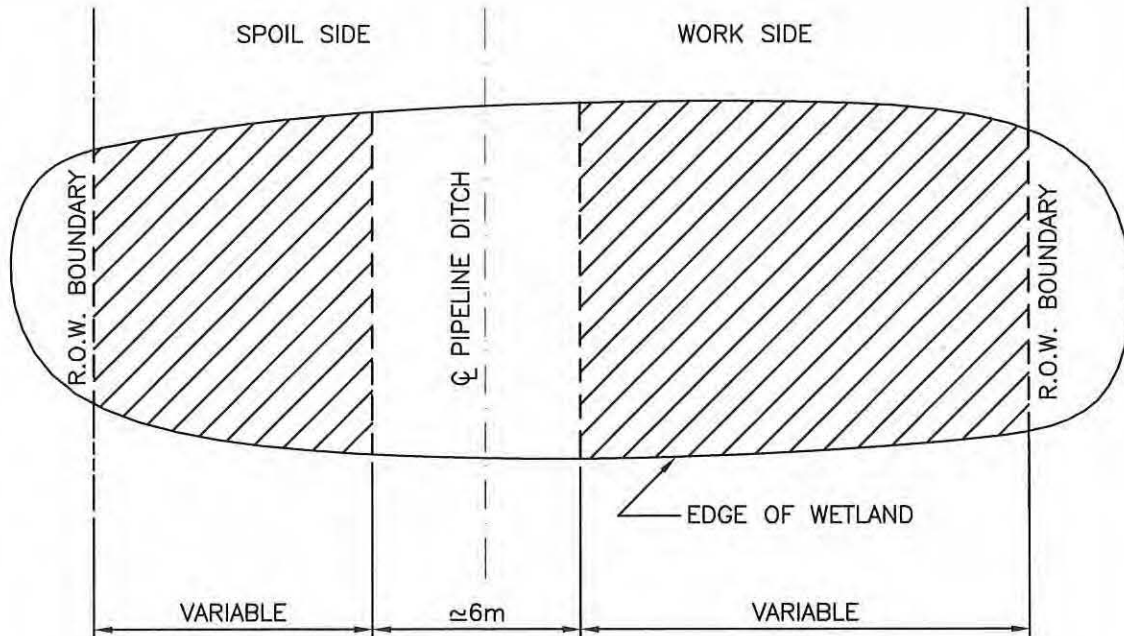
1. APPLIES TO WETLANDS IN ALL LAND-USE DESIGNATIONS WHERE OPEN WATER OR SATURATED GROUND CONDITIONS ARE ENCOUNTERED THAT WOULD PRECLUDE PRACTICAL TOPSOIL/SURFACE MATERIALS SALVAGE, OR WHERE OTHER PROCEDURES MAY BE SPECIFIED TO ADDRESS RARE PLANT OCCURRENCES.
2. SILT FENCE OR EQUIVALENT BARRIER SHALL BE INSTALLED ON THE PERIMETER OF RIGHT-OF-WAY DISTURBANCES THROUGH THE WETLAND WHERE DIRECTED BY THE COMPANY. THE INTENT IS TO AVOID SEDIMENT/SOIL MIGRATION BEYOND THE CONSTRUCTION FOOTPRINT. REFER TO DRAWING STDS-03-ML-05-132.
3. RESTRICT VEGETATION REMOVAL TO ONLY AREAS OVER THE TRENCH. MINIMIZE VEGETATION REMOVAL WIDTHS OVER THE AREA WHERE MATS OR GEOTEXTILE AND CLAYCAP ARE PLACED TO THE EXTENT PRACTICAL.
4. IF GROUND CONDITIONS ARE ENCOUNTERED THAT CREATES POTENTIAL FOR ADMIXING OR COMPACTION ON THE WORKSIDE, MINIMIZE GROUND DISTURBANCE BY USING A PROTECTIVE LAYER SUCH AS MATTING OR BIODEGRADABLE GEOTEXTILE AND CLAY RAMPS OR OTHER APPROVED MATERIALS BETWEEN WETLAND ROOT/SEED BED AND CONSTRUCTION EQUIPMENT.
5. IN LESS SENSITIVE AREAS, AND ONLY WHERE APPROVED BY THE COMPANY, SURFACE MATERIALS MAY BE STRIPPED ON THE WORKSIDE DOWN TO FIRM GROUND (EG. BEDROCK) TO FACILITATE CONSTRUCTION THROUGH THE WETLAND.
6. WHERE WATER IS ENCOUNTERED, SOIL MAY BE USED AS A CONTAINMENT BERM/BARRIER IF DEEMED NECESSARY TO FACILITATE CONSTRUCTION THROUGH THE WETLAND. GEOTEXTILE MAY BE REQUIRED TO PROVIDE AN ADEQUATE SEPARATION LAYER BETWEEN THE WETLAND VEGETATION AND CONTAINMENT BERM/BARRIER, AND TO ACHIEVE PROPER MATERIAL REMOVAL DURING CLEANUP. CONTAINMENT BERM/BARRIER MATERIALS SHALL BE APPROVED BY THE COMPANY.
7. LOCATE ALL EXTRA TEMPORARY WORK SPACE (IE. STAGING AREAS, GRADE/BORROW AREAS FOR RAMPING, ADDITIONAL SPOIL STORAGE AREAS) OUTSIDE THE WETLAND BOUNDARIES, UNLESS OTHERWISE APPROVED BY THE COMPANY.
8. WATER PUMPING SHALL BE TO STABLE OR WELL-VEGETATED AREAS AS APPROVED BY THE COMPANY. MONITOR DISCHARGE AREAS AND CHANGE HOSE/DISCHARGE LOCATION OR PUMP INTO FILTER BAGS OR OTHER FILTRATION DEVICES IF ADEQUATE NATURAL FILTRATION IS NO LONGER POSSIBLE AND SEDIMENTATION MAY OCCUR.
9. EXCAVATE TRENCH, INSTALL PIPE, BACKFILL TRENCH.
10. REMOVE MATS OR GEOTEXTILE/CLAYCAP, AND CONTAINMENT BERM/BARRIER DURING CLEANUP AND UTILIZE APPROPRIATE EQUIPMENT TO MINIMIZE SCALPING AND DEPOSITION ON UNSTRIPPED AREAS.
11. RESTORE SURFACE PROFILE TO THE EXTENT PRACTICAL LEAVE MINIMUM 1m WIDE GAPS IN THE TRENCH CROWN TO ENSURE CONTOURS DO NOT AFFECT DRAINAGE FOLLOWING CLEANUP.
12. INSTALL EROSION CONTROL MEASURES AS DIRECTED BY THE COMPANY.
13. ALSO REFER TO WETLAND MITIGATION MEASURES PROVIDED IN THE EPP.

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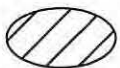


DESIGNER: *Douglas By* *May 30 2018*
NAME DATE
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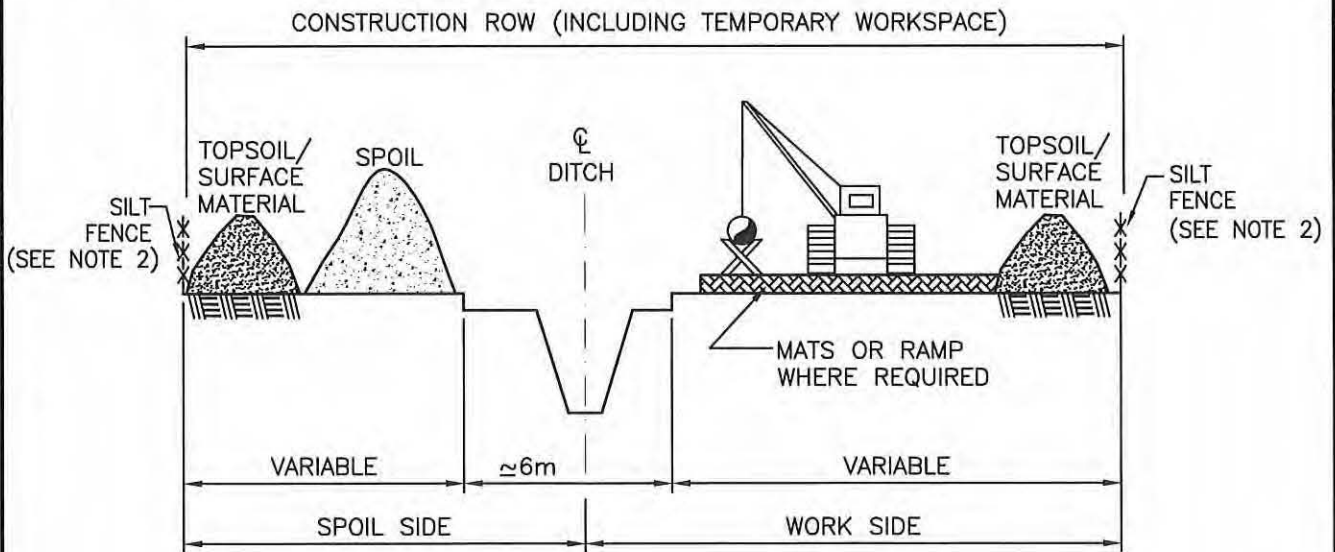
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FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE WETLAND MITIGATION OPEN WATER CROSSING (SHEET 2 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-003	REV 00



PLAN VIEW



DESIGNATES AREA WHERE NO STRIPPING SHALL OCCUR.



CROSS SECTION VIEW

REVISIONS 00 STANDARD ISSUED 2018-05-28 KPL

	DESIGNER: <i>Douglas B...</i> May 30 2018 <small>NAME DATE</small>	DESIGN STANDARD	
	CHECKED BY: <i>DM</i>	DESIGN CHECKER: <i>MZS</i>	FIA # STDS CHAINAGE:
TITLE WETLAND MITIGATION TYPICAL CROSSING (SHEET 1 OF 2)			
SCALE N.T.S.		DWG No STDS-03-ML-05-004	REV 00

TIME DESIGNFILE

NOTES:

1. APPLIES TO WETLANDS IN AGRICULTURE LAND-USE DESIGNATIONS THAT DO NOT HAVE OPEN WATER OR SATURATED GROUND CONDITIONS THAT WOULD PRECLUDE PRACTICAL TOPSOIL/SURFACE MATERIALS SALVAGE, OR WHERE OTHER PROCEDURES MAY BE SPECIFIED TO ADDRESS RARE PLANT OCCURRENCES. SALVAGE TOPSOIL/SURFACE MATERIALS FROM THE DITCHLINE AREA ONLY. PLACE ALONG EDGE OF ROW OR OTHER APPROVED LOCATION.
2. SILT FENCE OR EQUIVALENT BARRIER SHALL BE INSTALLED ON THE PERIMETER OF R.O.W. DISTURBANCES THROUGH THE WETLAND WHERE DIRECTED BY THE COMPANY. INTENT IS TO AVOID SEDIMENT/SOIL MIGRATION BEYOND THE CONSTRUCTION FOOTPRINT. REFER TO DRAWING STDS-03-ML-05-132.
3. RESTRICT VEGETATION REMOVAL TO ONLY AREAS OVER THE TRENCH. MINIMIZE VEGETATION REMOVAL WIDTHS OVER THE AREA WHERE MATS OR GEOTEXTILE AND CLAYCAP ARE PLACED TO THE EXTENT PRACTICAL.
4. IF GROUND CONDITIONS ARE ENCOUNTERED THAT CREATES POTENTIAL FOR RUTTING, ADMIXING OR COMPACTION ON THE WORKSIDE, MINIMIZE GROUND DISTURBANCE BY USING A PROTECTIVE LAYER SUCH AS MATTING OR BIODEGRADABLE GEOTEXTILE AND CLAY RAMPS OR OTHER APPROVED MATERIALS BETWEEN WETLAND ROOT/SEED BED AND CONSTRUCTION EQUIPMENT.
5. IN LESS SENSITIVE AREAS AND ONLY WHERE APPROVED BY THE COMPANY, SURFACE MATERIALS MAY BE STRIPPED ON THE WORKSIDE DOWN TO FIRM GROUND (EG. BEDROCK OR OTHER) TO FACILITATE CONSTRUCTION THROUGH THE WETLAND.
6. WHERE WATER IS ENCOUNTERED, SOIL MAY BE USED AS A CONTAINMENT BERM/BARRIER IF DEEMED NECESSARY TO FACILITATE CONSTRUCTION THROUGH THE WETLAND. GEOTEXTILE MAY BE REQUIRED TO PROVIDE AN ADEQUATE SEPARATION LAYER BETWEEN THE WETLAND VEGETATION AND CONTAINMENT BERM/BARRIER, AND TO ACHIEVE PROPER MATERIAL REMOVAL DURING CLEANUP. CONTAINMENT BERM/BARRIER MATERIALS SHALL BE APPROVED BY THE COMPANY.
7. LOCATE ALL EXTRA TEMPORARY WORK SPACE (IE. AS STAGING AREAS, GRADE/BORROW AREAS FOR RAMPING, ADDITIONAL SPOIL STORAGE AREAS) OUTSIDE OF THE WETLAND BOUNDARIES, UNLESS OTHERWISE APPROVED BY THE COMPANY.
8. WATER PUMPING SHALL BE TO STABLE OR WELL-VEGETATED AREAS AS APPROVED BY THE COMPANY. MONITOR DISCHARGE AREAS AND CHANGE HOSE/DISCHARGE LOCATION OR PUMP INTO FILTER BAGS OR OTHER FILTRATION DEVICES IF ADEQUATE NATURAL FILTRATION IS NO LONGER POSSIBLE AND SEDIMENTATION MAY OCCUR.
9. EXCAVATE TRENCH, INSTALL PIPE, BACKFILL TRENCH.
10. REMOVE MATS OR GEOTEXTILE/CLAYCAP AND CONTAINMENT BERM/BARRIER DURING CLEANUP AND UTILIZE APPROPRIATE EQUIPMENT TO MINIMIZE SCALPING AND DEPOSITION ON UNSTRIPPED AREAS.
11. RESTORE SURFACE PROFILE TO THE EXTENT PRACTICAL LEAVE MINIMUM 1m WIDE GAPS IN THE TRENCH CROWN TO ENSURE CONTOURS DO NOT AFFECT DRAINAGE FOLLOWING CLEANUP.
12. INSTALL EROSION CONTROL MEASURES AS DIRECTED BY THE COMPANY.
13. ALSO REFER TO WETLAND MITIGATION MEASURES PROVIDED IN THE EPP.

REVISIONS 00 STANDARD ISSUED 2018-05-28 KPL

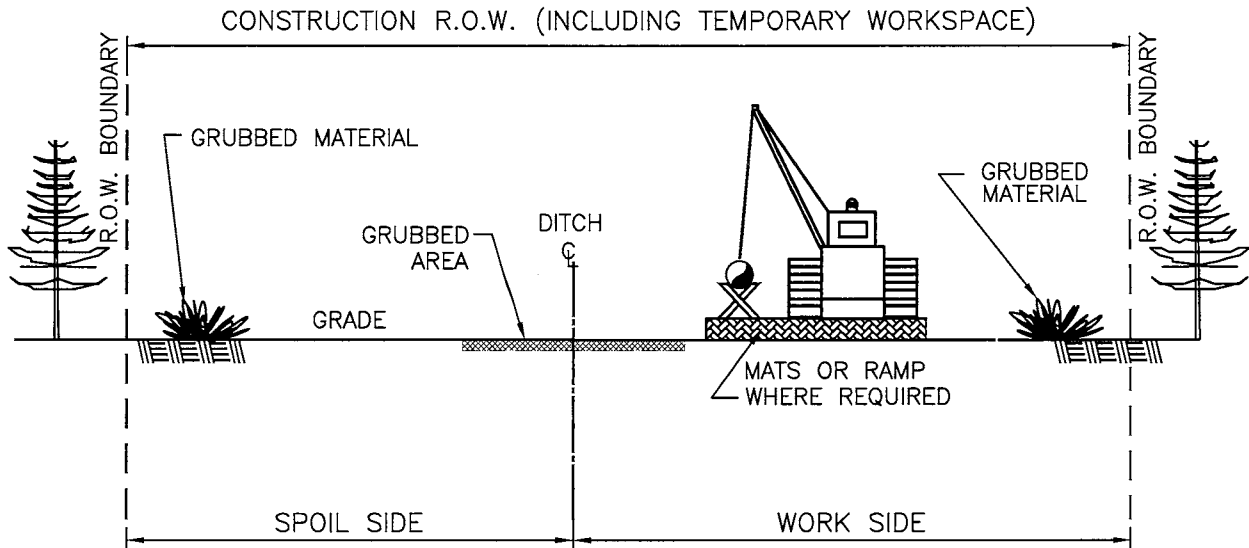
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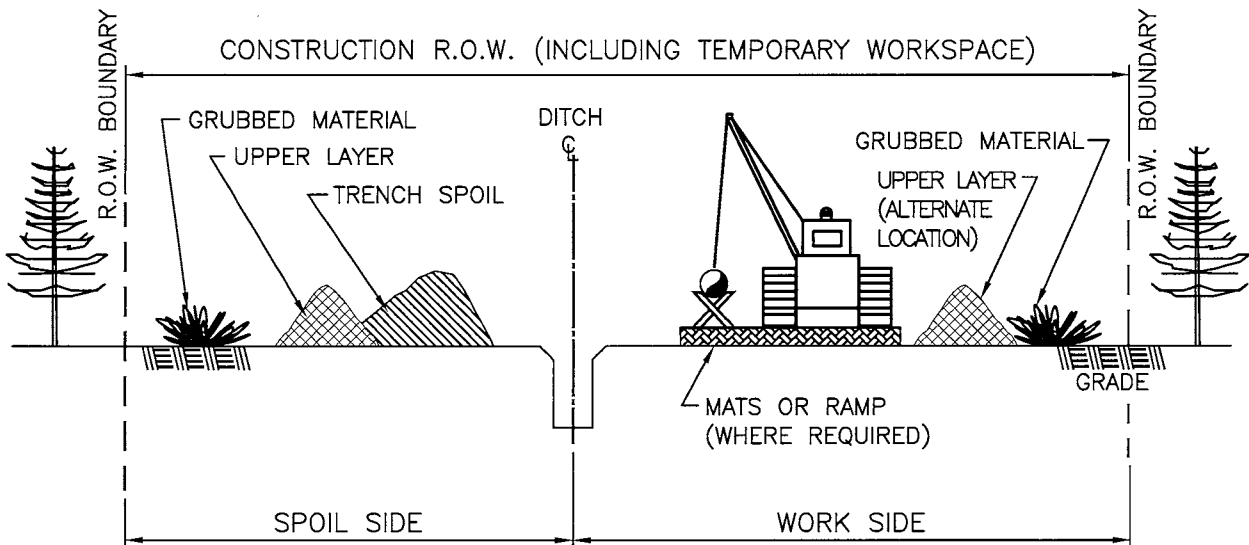
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DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE		WETLAND MITIGATION TYPICAL CROSSING (SHEET 2 OF 2)	
SCALE N.T.S.	DWG No	STDS-03-ML-05-005	REV 00



1. GRUB ROOTS/STUMPS FROM DITCH AREA OR GRADE AREAS ONLY, PLACE IN A WINDROW IN TEMPORARY WORK SPACE OR AREAS AS DIRECTED BY THE COMPANY. WHERE DICTATED BY PROJECT REQUIREMENTS, RESTRICT/MINIMIZE DISTURBANCE TO THE ROOT ZONE IN OTHER AREAS BY MULCHING OR CUTTING OF VEGETATION TO THE SURFACE ONLY TO FACILITATE CONSTRUCTION.



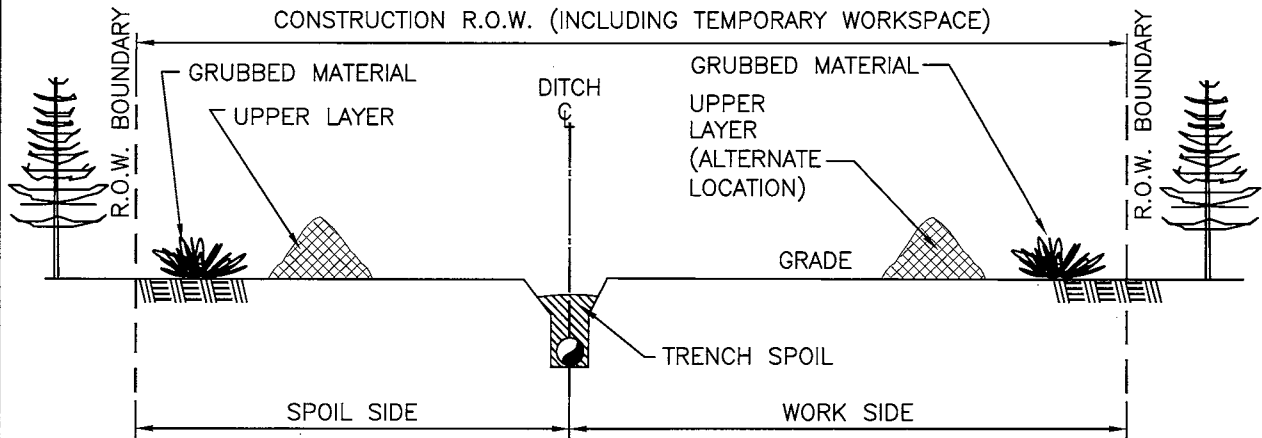
2. EXCAVATE THE UPPER LAYER OF THE TRENCH DEPTH SPECIFIED IN THE EPP, AND EAS. EXCAVATE THE REMAINDER OF THE TRENCH. PLACE IN STOCK PILES AS INDICATED ABOVE USING PRECAUTION TO MINIMIZE UNACCEPTABLE MIXING OF THE UPPER LAYER AND TRENCH SPOIL. THE UPPER LAYER MAY BE STOCKPILED IN THE ALTERNATE LOCATION AS SHOWN ABOVE WHERE APPROVED BY THE COMPANY. STOCKPILE PLACEMENT SHALL ALLOW FOR RE-PLACEMENT OF THE UPPER LAYER AND TRENCH SPOIL BACK IN THEIR ORIGINAL SEQUENCE TO THE EXTENT PRACTICAL.

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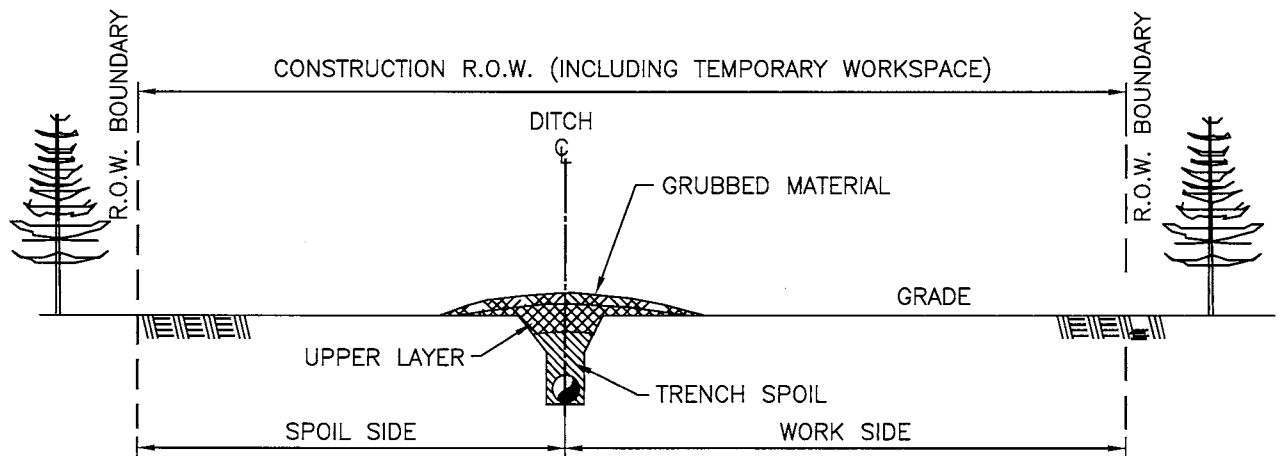


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DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE PEATLAND MATERIALS CONSERVATION TRENCH SPOIL 2 LIFT (SHEET 1 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-006	REV 00



3. BACKFILL TRENCH SPOIL.



4. BACKFILL AND REPLACE UPPER LAYER PILE EVENLY OVER TRENCH AREA TO THE DEPTHS AS SPECIFIED IN THE EPP AND EAS. PREPARE SURFACE PER APPROVED RECLAMATION PROCEDURE. GRUBBED MATERIALS SHALL BE REDISTRIBUTED ACROSS THE AREA OR DISPOSED OFF-SITE AS DIRECTED BY THE COMPANY.

5. LEAVE OPENINGS OVER THE TRENCH AREA TO ENSURE CROSS RIGHT-OF-WAY DRAINAGE IS MAINTAINED.

6. WHERE UTILIZED REMOVE MATS OR RAMP.

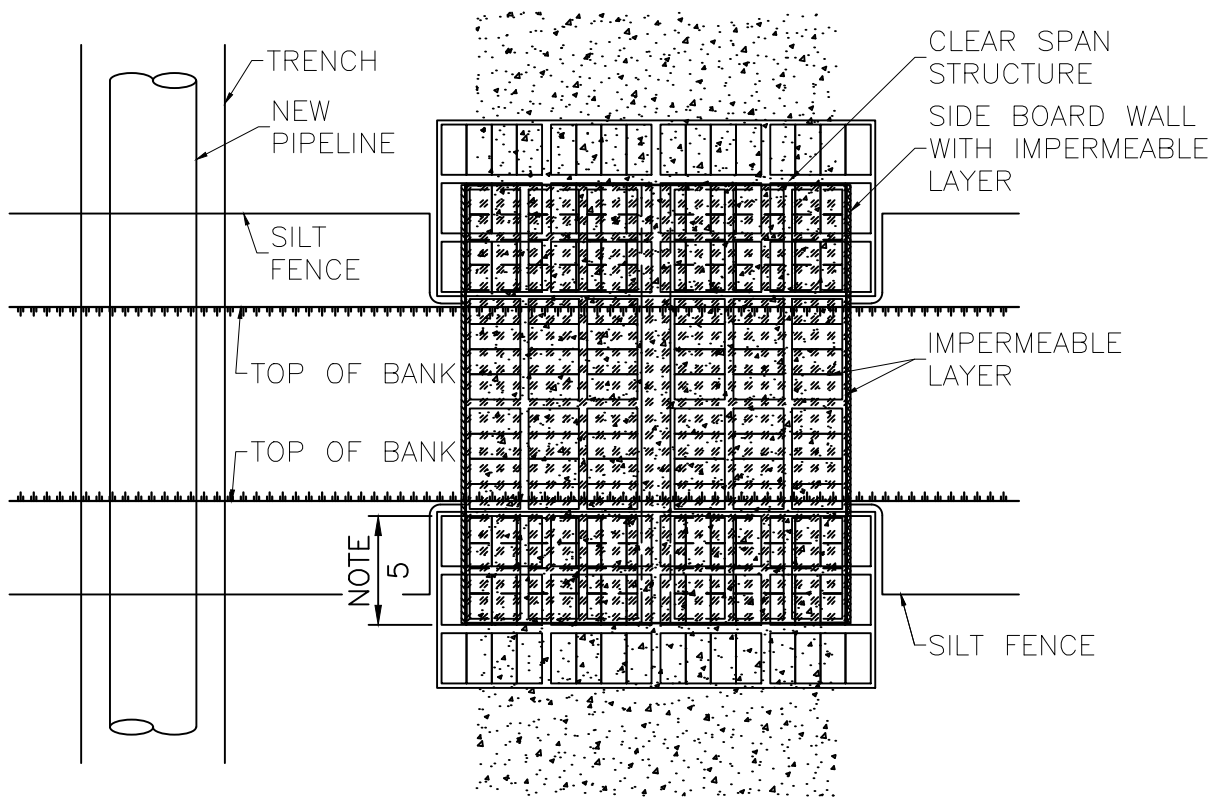
APPLICATION: AS DIRECTED BY THE COMPANY.

REVISIONS 00 STANDARD ISSUED 2018-05-28 RPL

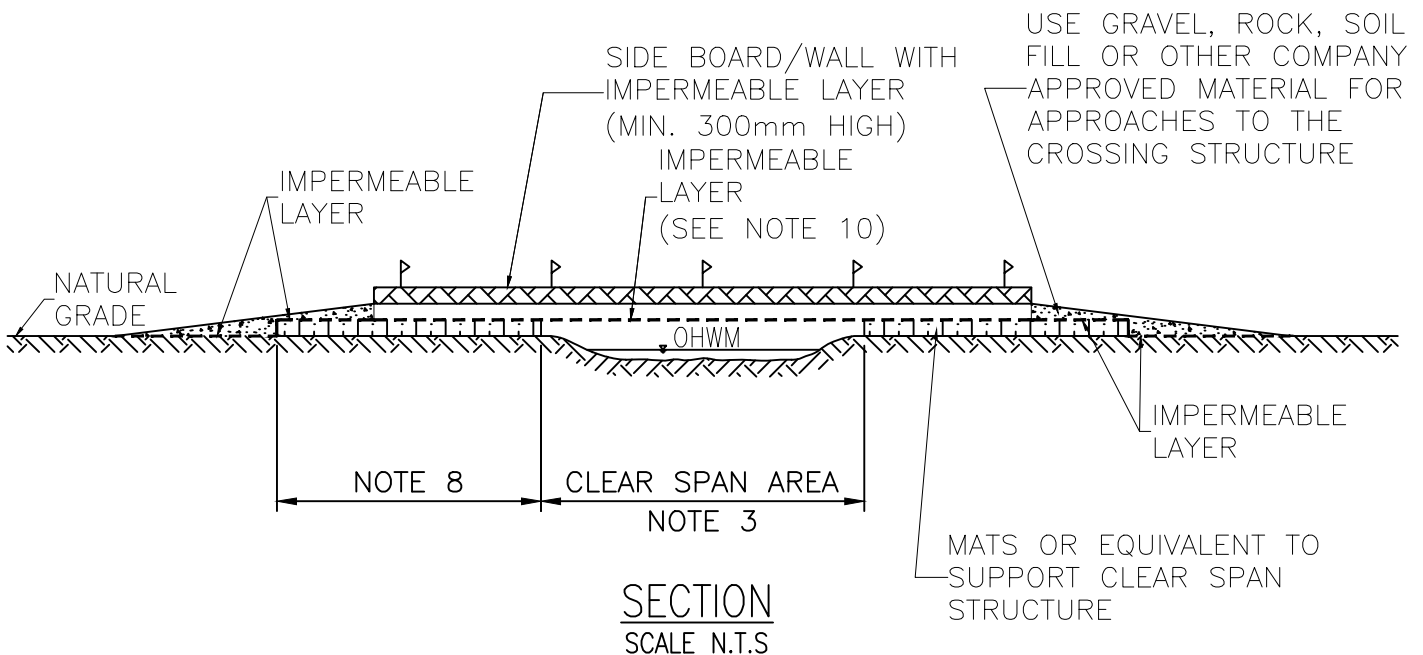


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FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE PEATLAND MATERIALS CONSERVATION TRENCH SPOIL 2 LIFT (SHEET 2 OF 2)			
SCALE N.T.S.	DWG No STDS-03-ML-05-007	REV 00	



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SECTION
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NOTE:
REFER TO PBAS-03-ML-05-102 AND PBAS-03-ML-05-103 FOR ADDITIONAL DETAILS AND NOTES

PBAS ISSUED (2022-05-06)

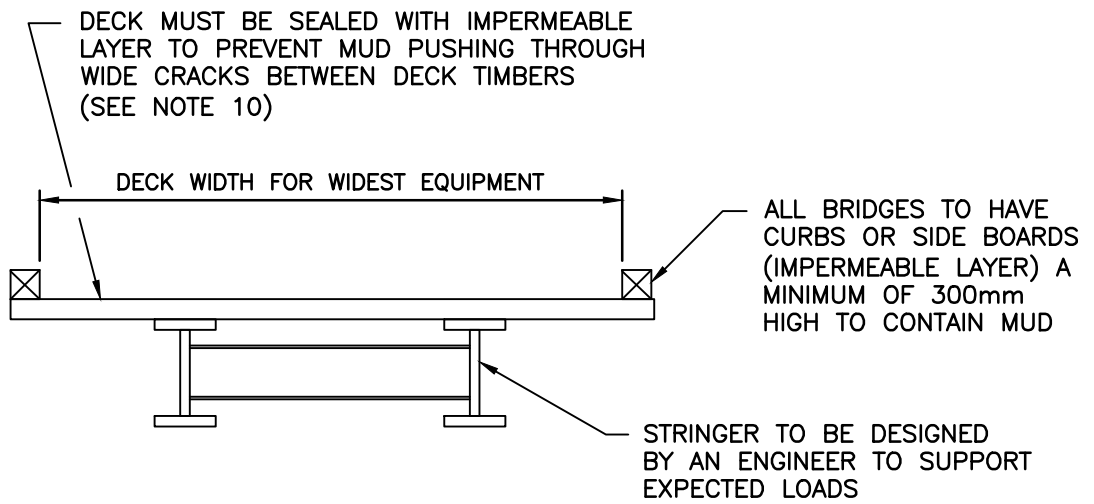
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JH	DATE

PIPELINE FACILITIES BASE DRAWINGS - CANADA			
FIA #	PBAS	CHAINAGE:	DISCIPLINE # 03
TITLE			
TEMPORARY CLEAR SPAN CROSSINGS (SHEET 1 OF 3)			
SCALE N.T.S.	DWG No	PBAS-03-ML-05-101	REV 00

TIME DESIGNFILE



TYPICAL STEEL BRIDGE SECTION

SCALE: N.T.S.

NOTE:

1. SEE PBAS-03-ML-05-101 AND PBAS-03-ML-05-103 FOR ADDITIONAL DETAILS AND NOTES.

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TIME DESIGNFILE



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NAME

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PIPELINE FACILITIES BASE DRAWINGS – CANADA

FIA #

PBAS

CHAINAGE:

DISCIPLINE #

03

TITLE

TEMPORARY CLEAR SPAN CROSSINGS
(SHEET 2 OF 3)

SCALE N.T.S.

DWG No

PBAS-03-ML-05-102

REV 00

GENERAL

1. FOR USE IN TEMPORARY CROSSINGS OVER WATERCOURSES OR DRAINAGE. CROSSING TYPES ARE CLEAR SPAN (eg. STEEL BRIDGE OR MATS) AND SHALL BE USED TO SUIT SITE SPECIFIC CONDITIONS. STRUCTURES SHALL BE DESIGNED, INSTALLED, MAINTAINED AND REMOVED IN ACCORDANCE WITH PROJECT PLANS, PERMITS, APPROVALS AND APPLICABLE SPECIFICATIONS.
2. DURATION OF THE TEMPORARY CLEAR SPAN CROSSING STRUCTURE PLACEMENT SHALL NOT EXCEED THE TIMEFRAME INDICATED IN PROJECT PLANS, PERMITS AND APPROVALS.
3. MEASURE THE APPROXIMATE TEMPORARY WATERCOURSE CROSSING LENGTH REQUIRED TO SPAN FROM BANK TO BANK. MINIMUM 500mm SETBACK FROM TOP OF BANK MUST BE PRESERVED AS NO DISTURBANCE AREA UNLESS APPROVED BY A COMPANY REPRESENTATIVE.
4. THE TYPE OF CLEAR SPAN STRUCTURE TO BE UTILIZED SHALL BE PROPERLY ASSESSED TO ENSURE THE MAXIMUM SPAN LENGTH AND LOAD IS NOT EXCEEDED.
5. INSPECTION OF MAT IS REQUIRED PRIOR TO FIELD INSTALLATION FOR SIGNS OF AGING AND DETERIORATION. DO NOT USE DAMAGED MAT(S). IF MATS ARE BEING UTILIZED, THE GAP BETWEEN MATS SHALL BE KEPT TO A MINIMUM.
6. CLEAR SPAN STRUCTURE SHALL BE SECURED AS REQUIRED TO AVOID MOVEMENT.
7. SIDE BOARD WALLS ARE REQUIRED ON BOTH SIDES OF THE CLEAR SPAN STRUCTURE.
8. MINIMIZE DISTURBANCE TO THE VEGETATION AND GROUND SURFACE TO THE EXTENT PRACTICAL. DISTURBANCE TO THE BED AND BANK WITHIN THE CLEAR SPAN AREA SHALL BE AVOIDED. GROUND SURFACE MAY REQUIRE MINOR DISTURBANCE TO ENSURE A PROPER BASE FOR PLACEMENT OF CLEAR SPAN STRUCTURE SUPPORTS AND SHALL BE APPROVED BY THE COMPANY PRIOR TO DISTURBANCE.
9. PLACE GEOTEXTILE FABRIC BETWEEN THE FILL MATERIAL AND THE SURFACE LAYER DURING CONSTRUCTION OF THE RAMP AND ABUTMENTS. INSTALL SILT FENCE AS INDICATED ON THE DRAWING.
10. AN IMPERMEABLE LINER SUCH AS GEOTEXTILE OR EQUIVALENT SHALL BE PLACED ACROSS THE DECK AND EXTENDED VERTICALLY AS PART OF THE SIDE BOARD WALLS TO A MINIMUM HEIGHT OF 300mm TO CONTAIN AND PREVENT SEDIMENT TRACKED ONTO THE SURFACE FROM ENTERING THE WATERCOURSE OR DRAINAGE. IMPERMEABLE LAYER SHALL BE PLACED IN A LOCATION (eg. BENEATH UPPER LAYER OF BRIDGE TIMBERS OR BENEATH MAT) TO PREVENT DAMAGE TO IT FOR EQUIPMENT AND VEHICLES.
11. ENSURE ABUTMENT LOCATION IS STABLE AND ABLE TO SUPPORT THE WEIGHT OF EQUIPMENT UTILIZING THE CROSSING STRUCTURE. ROAD APPROACHES LEADING TO THE VEHICLE CROSSING MUST BE RAISED OR CONSTRUCTED IN SUCH A MANNER TO PREVENT SEDIMENT FROM ENTERING THE WATERCOURSE OR DRAINAGE.
12. WHILE THE CROSSING STRUCTURE IS IN USE, ANY BUILDUP OF MUD ON THE DECK IS TO BE SCRAPED OFF PRIOR TO AFFECTING WATER QUALITY. ALL COMPONENTS OF THE STRUCTURE SHALL BE MAINTAINED TO ENSURE THEY ARE WORKING AS INTENDED.
13. UPON REMOVAL, ALL MATERIALS USED AS PART OF THE CLEAR SPAN CROSSING (ie. GEOTEXTILE, WOOD, GRAVEL, ROCK AND/OR SOIL APPROACHES FOR RAMP, ETC) SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH PROJECT PLANS, PERMITS AND APPROVALS.
14. WHERE GROUND DISTURBANCE WAS REQUIRED DURING INSTALLATION, THE EXPOSED AREA SHALL BE STABILIZED AS REQUIRED TO PREVENT EROSION OF SOIL INTO THE WATERCOURSE OR DRAINAGE.

SIZING OF WATER OPENING

IT IS IMPORTANT THAT THE SIZE OF THE WATER OPENING BE SELECTED SO THE STRUCTURE CAN SAFELY PASS FLOOD FLOWS THAT CAN REASONABLY BE EXPECTED TO OCCUR DURING THE LIFE OF THE CROSSING.

- a. INSTALL A STRUCTURE THAT CLEAR SPANS THE WATERCOURSE OR DRAINAGE FROM TOP OF BANK TO TOP OF BANK (AS SHOWN) AND WITH A CLEARANCE ABOVE THE ORDINARY HIGH WATER MARK (OHWM) OR AS INDICATED IN PROJECT PLANS, PERMITS AND APPROVALS.
- b. A HYDROLOGY ANALYSIS MAY BE REQUIRED TO DETERMINE THEORETICAL OPENING SIZE. REFER TO APPLICABLE DRAWINGS FOR REQUIREMENTS.

NOTE:

SEE PBAS-03-ML-05-101 AND PBAS-03-ML-05-102 FOR ADDITIONAL DETAILS

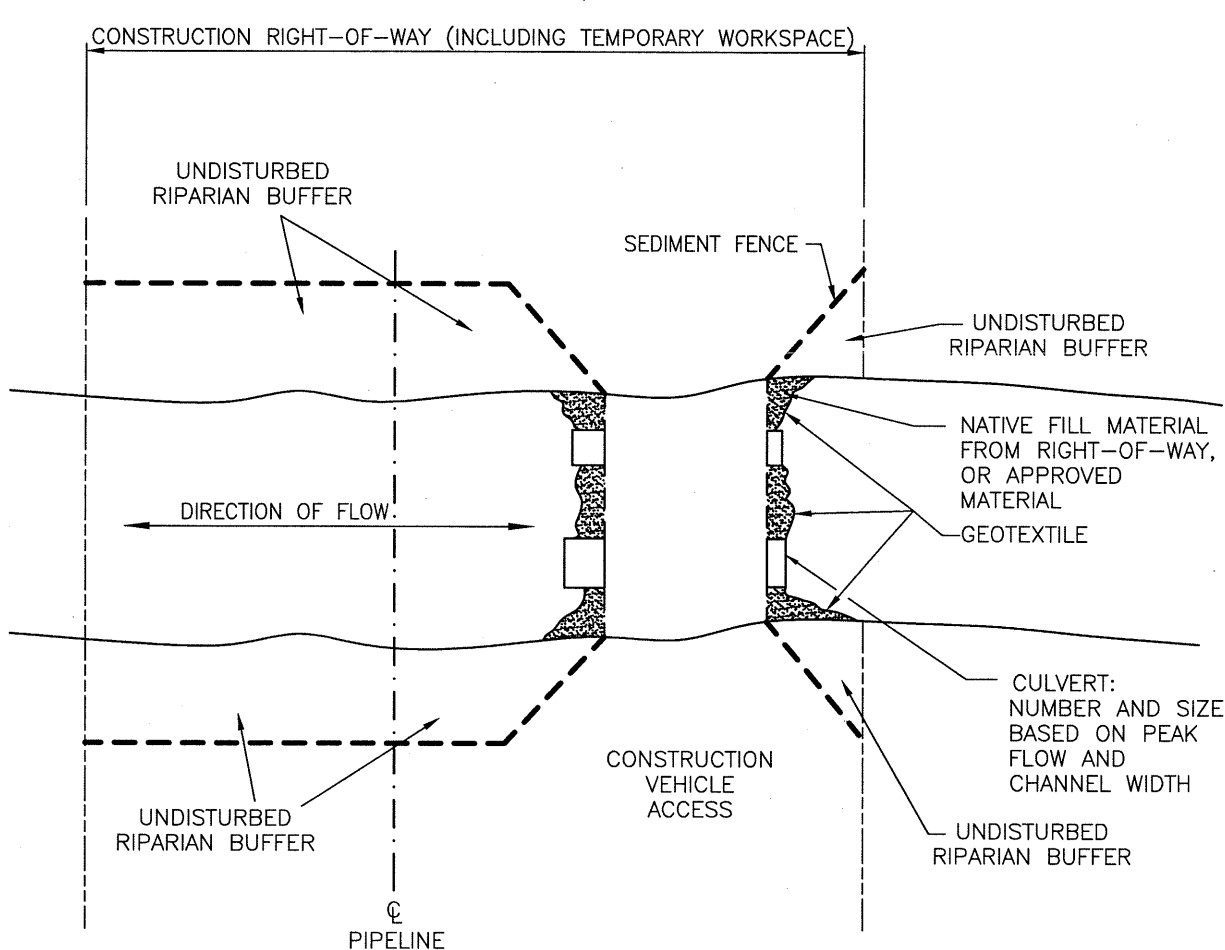


DESIGNER:		PIPELINE FACILITIES BASE DRAWINGS – CANADA		
WADE PRUETT		FIA # PBAS	CHAINAGE:	DISCIPLINE # 03
NAME DATE		TITLE		
		TEMPORARY CLEAR SPAN CROSSINGS (SHEET 3 OF 3)		
CHECKED BY:	DESIGN CHECKER:	SCALE N.T.S.	DWG No PBAS-03-ML-05-103	REV 00
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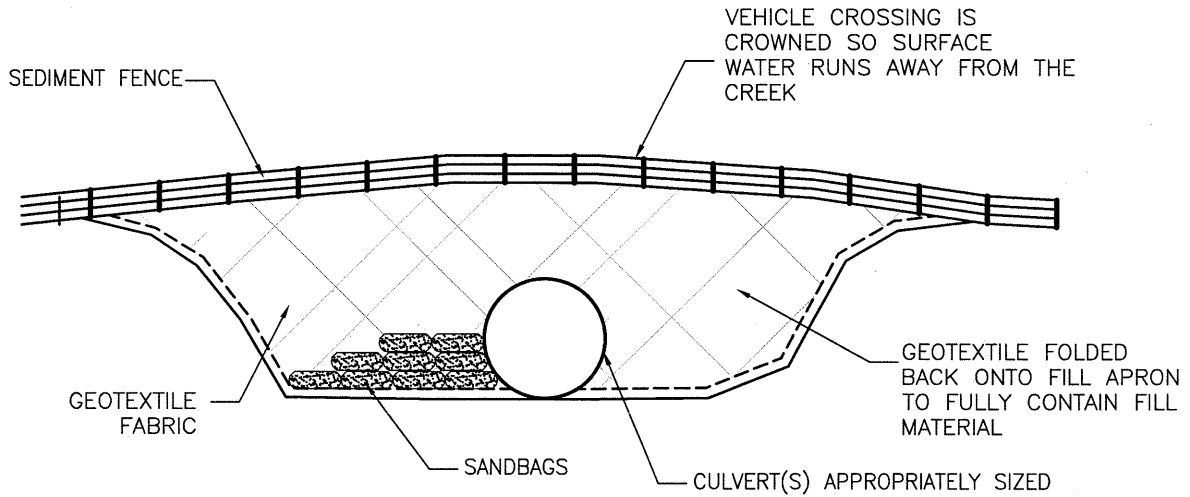


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NAME DATE
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DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE PIPELINE VEHICLE CROSSING - CULVERT WITH NATIVE FILL MATERIAL (SHEET 1 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-103	REV 01

TC_A4_EE.DWG 210X280

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



NOTES:

1. SEE APPLICABLE WATERCOURSE CROSSING TABLE AND/OR EPP FOR ALL LOCATIONS WHERE THIS TECHNIQUE CAN BE APPLIED.
2. NATIVE FILL IS FROM RIGHT-OF-WAY OR APPROVED MATERIAL AND SOURCE, BUT NOT FROM WATERCOURSE BED OR BANKS.
3. CULVERT(S) SIZED FOR EXPECTED PEAK FLOW OR OTHERWISE APPROVED BY THE COMPANY.
4. SEDIMENT FENCE TO BE INSTALLED AS PER MANUFACTURERS DIRECTIONS AND SPAN WIDTH OF WATERCOURSE PLUS 10m EACH SIDE OF WATERCOURSE ON BOTH SIDES OF VEHICLE ACCESS,
5. MONITORING AND MAINTENANCE OF SEDIMENT FENCE AND GEOTEXTILE IS REQUIRED.
6. SANDBAGS MAY BE REQUIRED TO ANCHOR GEOTEXTILE AND TO SEAL AROUND THE CULVERTS ON THE UPSTREAM AND DOWNSTREAM SIDES OF THE FILL APRON.

GENERAL ISSUE - REVIEWED FOR 2015 SPEC.

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DRAWING SUPERSEDES A2-SK-18-435

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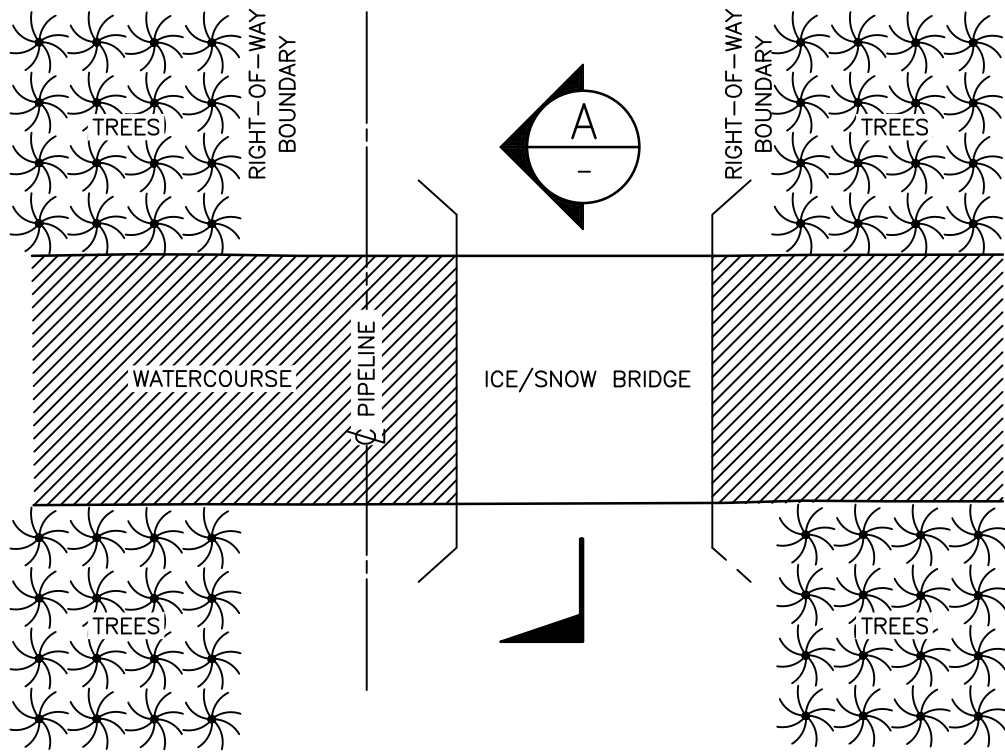
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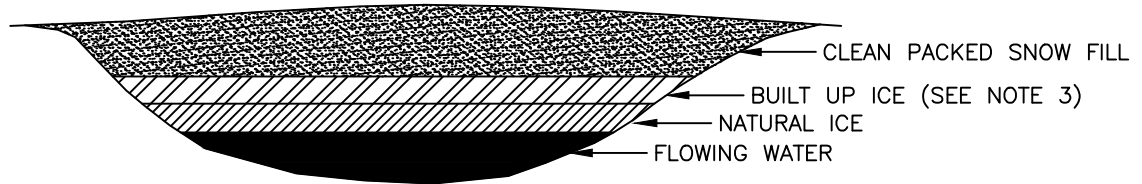
FIA # STDS CHAINAGE: DISCIPLINE # 03

TITLE PIPELINE VEHICLE CROSSING - CULVERT WITH NATIVE FILL MATERIAL (SHEET 2 OF 2)

SCALE N.T.S. DWG No STDS-03-ML-05-103 REV 01



PLAN VIEW



CROSS SECTION A

NOTES:

1. INSTALL ICE BRIDGES (CAPPED WITH SNOW FILL) ON WINTER PROJECTS WHEN A SAFE ICE THICKNESS CAN BE MAINTAINED.
2. LOCATE ICE BRIDGES AT SITES WITH GENTLY SLOPING BANKS TO MINIMIZE DISTURBANCE TO WATERCOURSE BANKS.
3. FLOOD ICE SURFACE AS REQUIRED WITH WATER AND COVER WITH SNOW TO INCREASE LOAD BEARING CAPACITY.
4. EXTEND SNOW PACK AND ICE BEYOND EDGES OF BANKS TO PROTECT BANKS AND RIPARIAN EDGES.
5. CLEAN SNOW CAN BE USED AS FILL OR CAP ABOVE THE SAFELY INSTALLED ICE BRIDGE IF AVAILABLE TO FACILITATE TRAVEL AND EQUIPMENT MOVEMENT.
6. ICE BRIDGE SHALL BE CONSTRUCTED WITH A MINIMUM OF 150mm ICE/SNOW CURB TO PREVENT MATERIAL FROM ENTERING THE WATERCOURSE. THE CURB MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
7. ICE BRIDGES SHOULD NOT INTERFERE OR IMPEDE WITH FLOW OF WATERCOURSE, OTHERWISE THEY SHALL BE NOTCHED OR REMOVED.
8. MAINTAIN CROSSING REGULARLY AND REMOVE ALL DEBRIS FROM CROSSING SURFACE.
9. AVOID DISTURBING BANKS. RESTORE AND STABILIZE APPROACHES PRIOR TO SPRING THAW AS REQUIRED.
10. NOTCH OR REMOVE ICE BRIDGE PRIOR TO SPRING THAW AND RUNOFF BY MECHANICAL MEANS TO PREVENT BLOCKAGE OF FLOW.

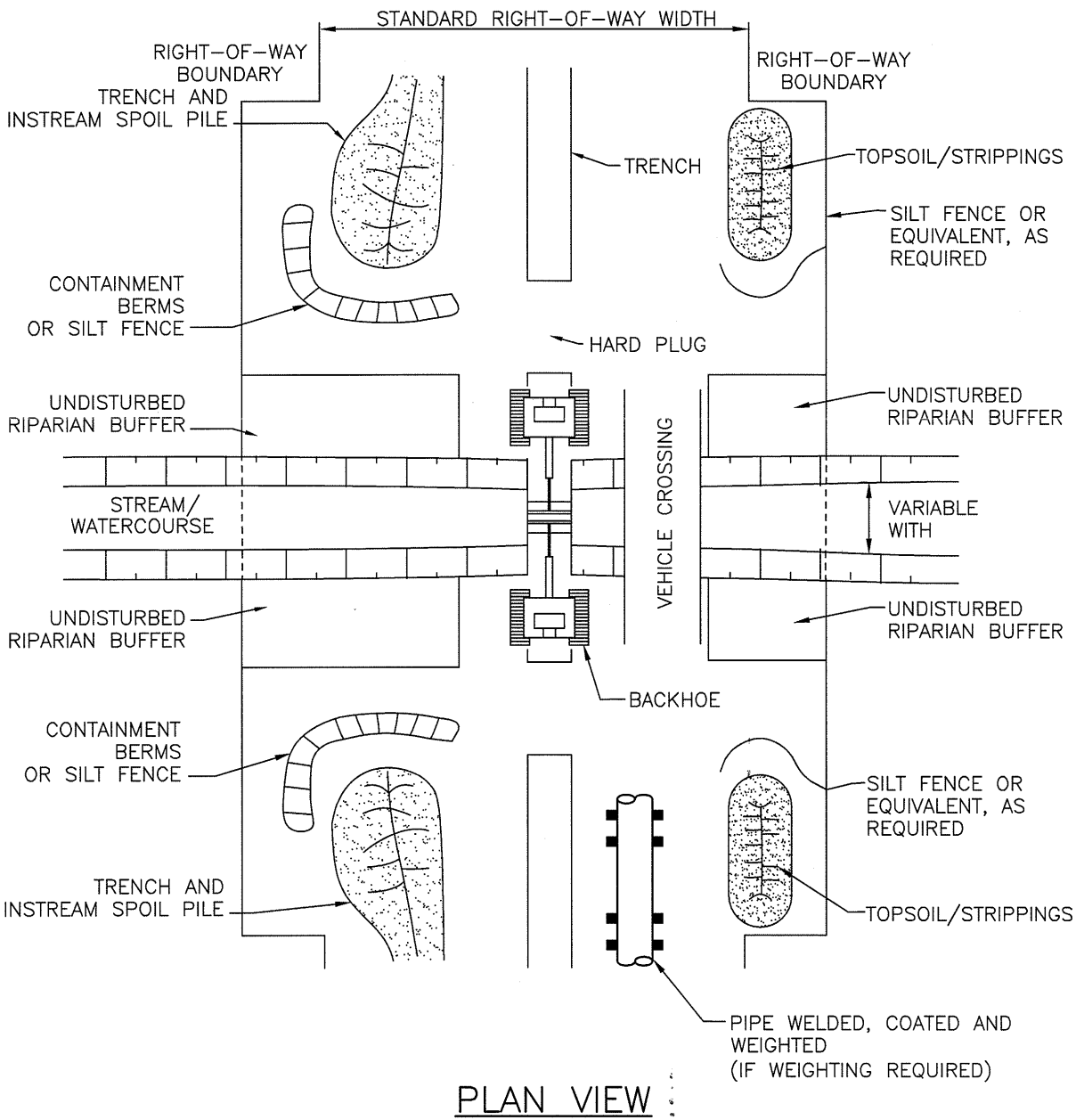
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WADE PRUETT <small>NAME</small>	2022-03-10 <small>DATE</small>
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TITLE	
TEMPORARY SNOWFILL/ICE BRIDGE CROSSING	
SCALE	DWG No
N.T.S.	PBAS-03-ML-03-008
REV 00	

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REVISIONS 00 STANDARD ISSUE 2015-06-03

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	DESIGNER: <i>[Signature]</i> June 15, 2015 <small>NAME DATE</small>	DESIGN STANDARD	
	CHECKED BY: <i>[Signature]</i>	DESIGN CHECKER: <i>[Signature]</i>	FIA # STDS CHAINAGE:
		TITLE TYPICAL OPEN CUT WATERCOURSE CROSSINGS (SHEET 1 OF 2)	
		SCALE N.T.S.	DWG No STDS-03-ML-05-105 REV 00

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NOTES:

1. SCHEDULE INSTREAM ACTIVITY FOR LOW FLOW PERIODS AND FOR THE APPROPRIATE TIMING WINDOW.
2. INSTALL APPROVED VEHICLE CROSSING.
3. LEAVE HARD PLUGS AT END OF STANDARD TRENCH.
4. COMPLETE FABRICATION OF THE INSTREAM PIPE SECTION WEIGHT AND PRETEST PIPE IF REQUIRED PRIOR TO COMMENCEMENT OF INSTREAM ACTIVITY.
5. TRENCH THROUGH WATERCOURSE RETAINING HARD PLUGS AT EACH BANK UNTIL JUST PRIOR TO PIPE INSTALLATION.
6. STOCKPILE ALL INSTREAM SPOIL ON BANKS WITHIN DESIGNATED AREA. IF NECESSARY TO CONTROL WATER FLOW AND TRENCH SLOUGHING, INSTALL TEMPORARY SOFT PLUGS AND DEWATER TRENCH ONTO STABLED VEGETATED LAND, NOT DIRECTLY TO WATERCOURSE.
7. CONSTRUCT BERM TO PREVENT SATURATED SPOIL FROM FLOWING BACK INTO STREAM. MAINTAIN STREAMFLOW, IF PRESENT, THROUGHOUT CROSSING CONSTRUCTION.
8. INSTALL PIPE AND BACKFILL IMMEDIATELY. RESTORE STREAM CHANNEL TO APPROXIMATE PRECONSTRUCTION PROFILE.
9. ATTEMPT TO COMPLETE ALL INSTREAM ACTIVITY WITHIN 24 HOURS, UNLESS OTHERWISE APPROVED BY THE COMPANY.
10. RESTORE AND STABILIZE STREAM BANKS AND APPROACHES TO AS CLOSE TO ORIGINAL GRADE AS POSSIBLE. INSTALL BANK PROTECTION, AS REQUIRED.
11. IN ALL WATERCOURSES, EXCAVATED MATERIALS SHALL BE REMOVED TO A POINT OUT OF WATER, EXCEPT WHERE OTHERWISE APPROVED BY THE COMPANY.
12. RIPARIAN BUFFER WIDTH MAY VARY BASED ON APPROVALS. THE BUFFER SHALL REMAIN UNDISTURBED, UNLESS APPROVED BY THE COMPANY.
13. THE CONTRACTOR SHALL PROVIDE A DETAILED WATERCOURSE CROSSING PLAN TO THE COMPANY FOR REVIEW AND APPROVAL AS DIRECTED BY THE COMPANY.

STANDARD ISSUE 2015-06-03

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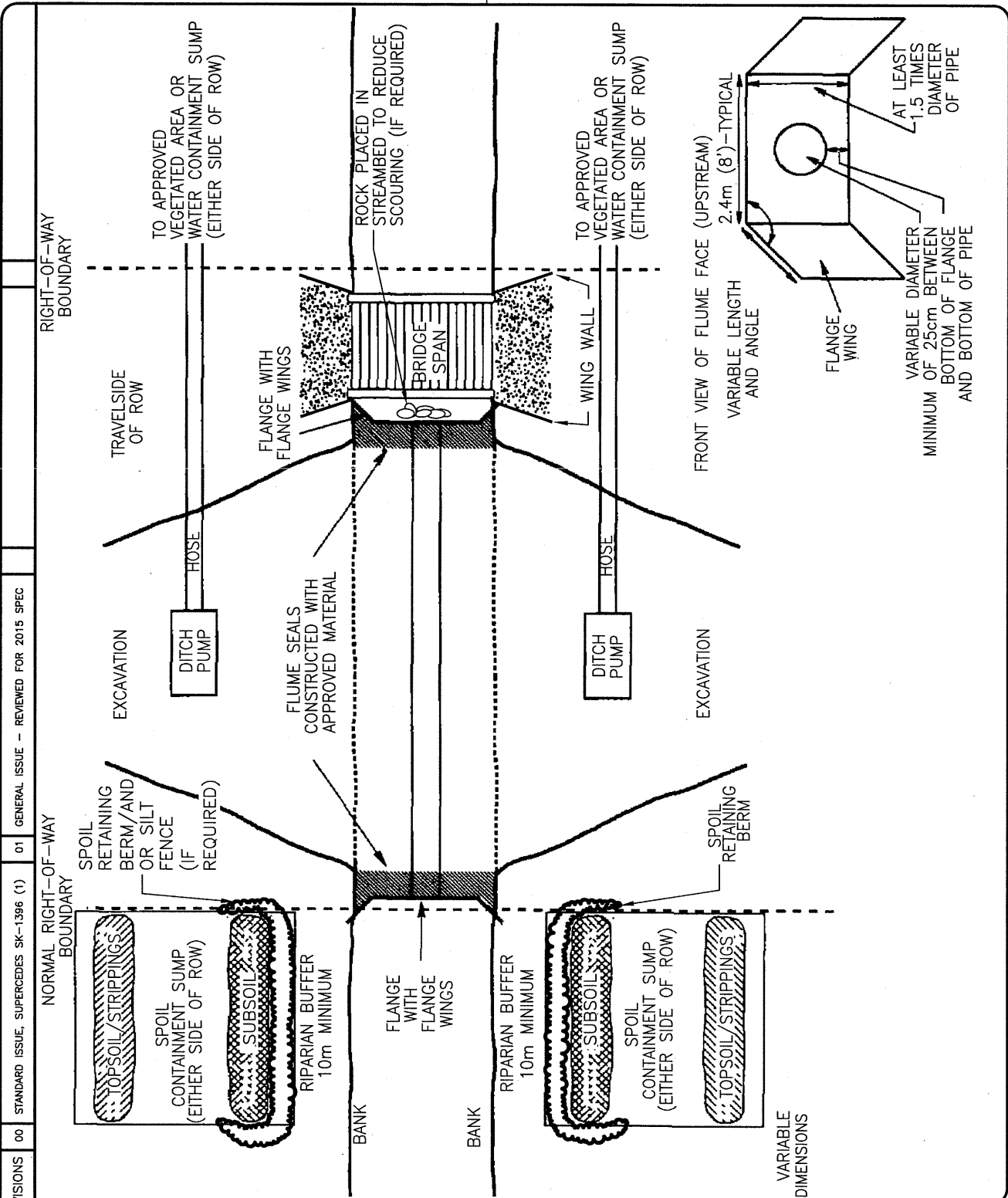
TITLE
 TYPICAL OPEN CUT
 WATERCOURSE CROSSINGS
 (SHEET 2 OF 2)

SCALE N.T.S.	DWG No	STDS-03-ML-05-105	REV 00
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REVISIONS	00	STANDARD ISSUE, SUPERCEDES SK-1396 (1)	01	GENERAL ISSUE - REVIEWED FOR 2015 SPEC
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 <i>David B...</i> June 16, 2015 NAME DATE		FIA #	STDS	CHAINAGE:
CHECKED BY:		DISCIPLINE # 03		
<i>...</i> DESIGN CHECKER:		TITLE		
		FLUME WATERCOURSE CROSSINGS (SHEET 1 OF 3)		
SCALE N.T.S.		DWG No	STDS-03-ML-05-111	REV 01

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APPLICATION:

FLUME OPERATIONS WILL BE REQUIRED ON STREAMS WHERE FLOW MUST BE MAINTAINED AND SILTATION MUST BE MINIMIZED TO PREVENT IMPACT ON FISH POPULATIONS AND DOWNSTREAM USERS. FLUME INSTALLATIONS WILL ALSO BE CONSIDERED WHERE MAINTENANCE OF FLOW IS THE ONLY REQUIREMENT.

THE FOLLOWING SPECIFICATIONS AND PROCEDURES ARE GENERAL REQUIREMENTS FOR INSTALLATION OF FLUMED WATERCOURSE CROSSINGS WHICH ARE TO BE APPLIED UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

SPECIFICATIONS:

1. FLUMING OPERATIONS WILL BE COMBINED WITH A BRIDGED VEHICLE CROSSING. CULVERT AND GRADE INSTALLATIONS WILL BE CONSIDERED FOR STREAMS HAVING A LOWER SENSITIVITY.
2. FLUME LENGTH WILL SPAN FROM THE SPOIL SIDE EDGE OF THE RIGHT-OF-WAY TO THE SPOIL SIDE EDGE OF THE VEHICLE CROSSING, OR TO THE WORK SIDE EDGE OF THE RIGHT-OF-WAY IN THE CASE OF A GRADE MATERIAL VEHICLE
3. BASED ON EXPECTED STREAM FLOWS; FLUME CAPACITY WILL BE RECOMMENDED BY THE CONTRACTOR FOR DIAMETER AND NUMBER OF PIPES REQUIRED. THE REQUIREMENTS MAY BE ADJUSTED BY THE COMPANY IN THE FIELD IN CONSULTATION WITH THE CONTRACTOR AND AUTHORITIES.
4. FLANGES WILL BE REQUIRED ON BOTH ENDS OF THE FLUME. THE FLANGES WILL BE CONSTRUCTED OUT OF STEEL AND MUST BE OF A THICKNESS AND DIMENSION TO WITHSTAND SITE BED AND BANK CONDITIONS, AS WELL AS FLUCTUATIONS IN WATERCOURSE FLOW CONDITIONS. REQUIREMENTS FOR LARGER FLANGES OR FLANGE WINGS WILL BE PRE-SPECIFIED OR DETERMINED BY THE COMPANY IN THE FIELD DURING CONSTRUCTION. CONTRACTOR MUST BE PREPARED TO CONSTRUCT THE FLUME ON SITE.
5. FLUMES MUST BE CONSTRUCTED OF STEEL PIPE OR OTHER MATERIAL APPROVED BY THE COMPANY. CORRUGATED CULVERT IS UNACCEPTABLE.
6. BOTH ENDS OF THE FLUME WILL BE SEALED USING APPROVED COMBINATIONS OF WASHED ROCK, PLASTIC SHEETING, FILTER CLOTH, AND SANDBAGS. IF LOOSE MATERIALS ARE USED TO CREATE THE SEALS, THE FLUME SEALS MUST BE A MINIMUM OF 2 METRES THICK AND EXTEND FROM BANK TOP TO BANK TOP, OR A MINIMUM OF 1 METRE ABOVE WATER LEVEL. IF SANDBAGS ARE USED THE FLUME SEALS MUST BE A MINIMUM OF 1 METRE THICK AND EXTEND FROM BANK TOP TO BANK TOP. IF PLASTIC SHEETING OR FILTER CLOTH ARE SPECIFIED THEY MUST BE LAID OVER BOTH SIDES OF BOTH FLUME SEALS. THE GOAL IS TO PREVENT CLEAN SURFACE WATER FROM ENTERING THE EXCAVATION AND PREVENT SILTED WATER FROM LEAVING THE EXCAVATION.
7. CONTRACTOR SHALL CONSTRUCT SUMPS WHEN DIRECTED BY THE COMPANY TO CONTAIN EXCAVATED MATERIAL AND/OR SILT LADEN WATER PUMPED FROM THE TRENCH. TOPSOIL OR ORGANICS SHALL BE REMOVED AND CONSERVED PRIOR TO EXCAVATION OF SUMPS. THE SUMPS SHALL BE SIZED TO CONTAIN ALL EXCAVATED MATERIAL, AND ALLOW PUMPING OF THE TRENCH WITHOUT ANY DOWNSTREAM SILTATION.
8. THE CONTRACTOR MUST HAVE PUMPS OF SUFFICIENT CAPACITY ON SITE TO PUMP OUT THE EXCAVATION TO PREVENT DOWNSTREAM FLOW OF SILTED WATER. BACK UP PUMPS TO BE SUPPLIED BY CONTRACTOR. CONTRACTOR MUST HAVE SUFFICIENT LEAK FREE HOSE ON SITE TO PUMP THE EXCAVATION WATER TO ANY LOCATION IN PROXIMITY TO THE FLOODPLAIN OF THE CROSSING SPECIFIED BY THE COMPANY. THIS IS TO FACILITATE SETTLEMENT AND FILTRATION OF THE SILTED WATER BEFORE IT RE-ENTERS THE STREAM. FLOW DISSIPATERS WILL BE REQUIRED AT THE DISCHARGE END OF ALL HOSES TO PREVENT FURTHER SILTATION AND EROSION.
9. CONTRACTOR WILL BE RESPONSIBLE FOR SUPPLY AND DELIVERY OF ALL MATERIALS TO THE SITE.
10. FISH SALVAGE WILL BE CONDUCTED AS REQUIRED IN ISOLATED AREA AFTER FLUME IN PLACE, AND PRIOR TO DEWATERING AND TRENCHING.
11. SIGNAGE WILL BE INSTALLED PER NAVIGATION PROTECTION ACT, AND OTHER REGULATIONS AND PROGRAMS, WHERE APPLICABLE.

REVISIONS 00 STANDARD ISSUE, SUPERCEDES SK-1396 (1) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



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DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE			
FLUME WATERCOURSE CROSSINGS (SHEET 2 OF 3)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-111	REV 01

PROCEDURES:

1. INSTALL THE VEHICLE CROSSING ON THE WORK SIDE OF THE RIGHT-OF-WAY TO ALLOW FOR A WIDE EXCAVATION.
2. STOCKPILE ALL REQUIRED MATERIALS AND EQUIPMENT ON THE SITE PRIOR TO BEGINNING INSTREAM WORK.
3. GRADE THE BANKS OF THE WATER CROSSING AND PREPARE THE SPOIL CONTAINMENT AREAS.
4. CONSTRUCT THE FLUME WITH CORRECT FLANGES AND FLANGE WINGS. COMPLETE WELDING, COATING, AND WEIGHTING (PRESSURE TESTING OF DRAG SECTION, IF APPLICABLE) OF THE WATERCOURSE PIPE SECTION.
5. BEGINNING IN THE EARLY MORNING, INSTALL THE FLUME IN THE STREAM CHANNEL USING APPROVED SEALING TECHNIQUES. PERFORM FISH SALVAGE AS DIRECTED, THEN DEWATER THE AREA BETWEEN THE FLANGE WINGS.
6. EXCAVATE THE TRENCH AS QUICKLY AS POSSIBLE PLACING SPOIL OUT OF THE STREAM CHANNEL. CREATE SPOIL CONTAINMENT SUMPS IF NECESSARY TO KEEP SPOIL FROM FLOWING BACK INTO THE STREAM CHANNEL.
7. PUMP EXCAVATION AS REQUIRED TO PREVENT DOWNSTREAM FLOW OF SILTED WATER. DIRECT THE PUMPED WATER INTO VEGETATED AREAS WELL BACK FORM THE WATERCOURSE. CONSTRUCT WATER CONTAINMENT SUMPS.
8. INSTALL PIPE.
9. BACKFILL THE STREAM CHANNEL FIRST PUSHING THE SILTED WATER INTO THE BANK EXCAVATIONS, WHERE PRACTICAL. PUMP OR DRAIN THE EXCAVATIONS WHILE PROGRESSIVELY BACKFILLING AS REQUIRED. CONSTRUCT WATER CONTAINMENT SUMPS IF NECESSARY.
10. COMPLETE BACKFILL
11. RE-ESTABLISH THE BED AND BANKS OF THE STREAM CHANNEL.
12. REMOVE THE DOWNSTREAM SEAL MATERIALS.
13. REMOVE THE UPSTREAM SEAL MATERIALS.
14. REMOVE THE FLUME.

NOTE:

THE CONTRACTOR SHALL PROVIDE A DETAILED WATERCOURSE CROSSING PLAN TO THE COMPANY FOR REVIEW AND APPROVAL AS DIRECTED BY THE COMPANY.

GENERAL ISSUE -- REVIEWED FOR 2015 SPEC



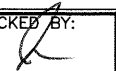

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STANDARD ISSUE, SUPERCEDES SK-1396 (1)

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CHECKED BY:  <small>NAME</small>		DESIGN CHECKER:  <small>NAME</small>		TITLE FLUME WATERCOURSE CROSSINGS (SHEET 3 OF 3)			
		SCALE N.T.S.		DWG No		STDS-03-ML-05-111	REV 01

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APPLICATION:



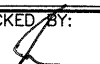

DAM AND BYPASS PUMPING OPERATION WILL BE APPLIED ON STREAMS HAVING A LOW FLOW RATE. THE PRIME CONSIDERATION WILL BE MAINTENANCE OF DOWNSTREAM FLOW.

DAM AND PUMP INSTALLATIONS MAY ALSO BE CONSIDERED FOR ANY STREAM WHERE FLUMES ARE PREVENTED BY PIPE BEND AND TIE-IN CONSTRAINTS. THE FOLLOWING SPECIFICATION AND PROCEDURES ARE GENERAL REQUIREMENTS FOR DAM AND PUMP INSTALLATIONS AND SHOULD TO BE APPLIED UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENT.

SPECIFICATIONS:

1. DAM AND BYPASS OPERATIONS MAY BE COMBINED WITH CULVERT AND GRADE VEHICLE CROSSINGS. OTHER APPROVED BRIDGING TECHNIQUES WILL BE USED IN PLACE OF CULVERT AND GRADE ON STREAMS HAVING GREATER SENSITIVITY.
2. BYPASS PUMPING UNIT MUST BE CAPABLE OF HANDLING 150% OF MAXIMUM SPECIFIED STREAM FLOW DURING THE PERIOD OF INSTALLATION FOR SUMMER CONSTRUCTION, AND 110% FOR WINTER CONSTRUCTION. A BACKUP UNIT OF EQUAL CAPACITY MUST BE INSTALLED IN CASE OF MAIN PUMP FAILURE.
3. PUMPS MUST BE MANNED CONTINUOUSLY UNTIL OPERATION IS COMPLETE (24 HRS/DAY).
4. PUMPS AND FUEL SUPPLY MUST BE PLACED IN A PLASTIC/IMPERMEABLE LINED BERMED AREA TO CONTAIN ACCIDENTAL SPILLS.
5. BYPASS PUMP INTAKE MUST HAVE A 2.54mm SIEVE TO PROTECT FISHERIES RESOURCES.
6. DAMS WILL BE CONSTRUCTED AS REQUIRED USING APPROVED COMBINATIONS OF AQUA DAM, STEEL PLATES, SHEET PILING, WASHED ROCK, PLASTIC SHEETING, FILTER CLOTH AND SANDBAGS. IF LOOSE MATERIALS ARE USED TO CREATE THE DAMS, THE DAMS MUST BE A MINIMUM OF 2 METERS THICK, UNLESS OTHERWISE APPROVED, AND EXTEND FROM BANK TOP TO BANK TOP. IF SANDBAGS ARE USED TO CREATE THE DAMS, THE DAMS MUST BE A MINIMUM OF 1 METER THICK AND EXTEND FROM BANK TOP TO BANK TOP, OR AS APPROVED BY THE COMPANY. IF PLASTIC SHEETING OR FILTER CLOTH ARE SPECIFIED, THEY MUST BE LAID OVER BOTH SIDES OF BOTH DAMS. THE GOAL IS TO PREVENT CLEAN SURFACE WATER FROM ENTERING THE EXCAVATION AND TO PREVENT SILTED WATER FROM LEAVING THE EXCAVATION. THE LEVEL OF EXISTING WATER COURSE SILTATION WILL BE CONSIDERED/MEASURED AT THE START OF CONSTRUCTION.
7. CONTRACTOR MUST HAVE SUFFICIENT LEAK FREE HOSE OR PIPE ON SITE AND INSTALLED TO BYPASS PUMP AROUND THE EXCAVATION AND/OR THROUGH THE EXCAVATION. THE CONTRACTOR SHALL ALSO INSTALL BACK-UP HOSES AND/OR PIPE TO ENSURE FLOW IS MAINTAINED IN THE EVENT OF A BYPASS FAILURE.
8. THE BYPASS PUMP DISCHARGE HOSE MUST BE EQUIPPED WITH FLOW DISSIPATORS AND PLACED IN SUCH A MANNER THAT PREVENTS FURTHER EROSION AND SILTATION DOWNSTREAM OF THE DAM AND PUMP INSTALLATION.
9. THE CONTRACTOR MUST HAVE AT LEAST TWO PUMPS ON SITE OF SUFFICIENT CAPACITY TO PUMP OUT THE EXCAVATION TO PREVENT DOWNSTREAM FLOW OF SILTED WATER. BACKUP PUMPS MUST BE SUPPLIED BY THE CONTRACTOR. SUFFICIENT LEAK FREE HOSE MUST BE ON SITE TO PUMP THE EXCAVATION WATER TO ANY LOCATION IN PROXIMITY TO THE FLOODPLAIN OF THE CROSSING. THIS IS TO FACILITATE SETTLEMENT AND FILTRATION OF THE SILTED WATER BEFORE IT RE-ENTERS THE STREAM. CONTRACTOR MUST ALSO BE PREPARED TO CREATE SUMPS FOR SILTATION SETTLING. FLOW DISSIPATORS WILL BE REQUIRED AT THE DISCHARGE END OF ALL HOSES TO PREVENT FURTHER SILTATION AND EROSION DOWNSTREAM OF THE DAM AND PUMP INSTALLATION.
10. CONTRACTOR WILL BE RESPONSIBLE FOR SUPPLY AND DELIVERY OF ALL MATERIALS TO THE SITE.
11. FISH SALVAGE WILL BE CONDUCTED AS REQUIRED IN ISOLATED AREA AFTER DAM AND PUMP IN PLACE, AND PRIOR TO TRENCHING.
12. SIGNAGE WILL BE INSTALLED AS PER NAVIGATION PROTECTION ACT AND OTHER REGULATIONS AND PROGRAMS WHERE APPLICABLE.

REVISIONS 00 01 GENERAL ISSUE - SUPERCEDES SK-1551 (2) STANDARD ISSUE, SUPERCEDES FOR 2015 SPEC

	DESIGNER:	DESIGN STANDARD		
	 NAME DATE June 16, 2015	FIA #	STDS	CHAINAGE:
CHECKED BY:		DESIGN CHECKER:		TITLE TYPICAL DAM AND PUMP WATER COURSE CROSSING (SHEET 2 OF 3)
				SCALE N.T.S.
		DWG No		STDS-03-ML-05-112
				REV 01

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PROCEDURE:

1. INSTALL THE VEHICLE CROSSING ON THE WORK SIDE OF THE RIGHT-OF-WAY TO ALLOW FOR A WIDE EXCAVATION.
2. COMPLETE WELDING, COATING, AND WEIGHTING (PRESSURE TESTING OF DRAG SECTION, IF APPLICABLE) OF THE WATERCOURSE PIPE SECTION.
3. PERFORM THE BANK GRADE AND PREPARE SPOIL CONTAINMENT SUMPS AS CIRCUMSTANCES DICTATE.
4. PRIOR TO INSTREAM WORKS, THE LENGTH OF TRENCHING SHALL BE SHORTENED UP AS MUCH AS TERRAIN AND PIPE SECTION LENGTH ALLOW TO DECREASE THE DURATION OF INSTREAM WORKS.
5. STOCKPILE ALL REQUIRED MATERIALS AND EQUIPMENT ON THE SITE PRIOR TO BEGINNING INSTREAM WORK.
6. INSTALL PUMPS AND CHECK OPERATION TO EQUALIZE FLOW. INSTALL CLEAN WATER BYPASS AND GRAY WATER HOSES AND ASSOCIATED SEDIMENTATION AND/OR EROSION CONTROLS.
7. BEGIN THE ISOLATION IN THE EARLY MORNING TO ALLOW FOR SAME DAY INSTALLATION
8. INITIATE PUMPING AND CHECK OPERATION TO EQUALIZE FLOW.
9. CONSTRUCT THE UPSTREAM DAM USING SPECIFIED DAM BUILDING TECHNIQUES. DAM SHOULD BE CONSTRUCTED TO ALLOW FOR A WIDE EXCAVATION. CONTINUE TO MONITOR UPSTREAM AND DOWNSTREAM WATER LEVEL.
10. PLUG THE VEHICLE CROSSING CULVERT OR CONSTRUCT THE DOWNSTREAM DAM USING SPECIFIED DAMMING TECHNIQUES. WHERE A BRIDGE IS USED, THE DAM SHOULD BE CONSTRUCTED TO ALLOW FOR A WIDE EXCAVATION. CONTINUE TO MONITOR UPSTREAM AND DOWNSTREAM WATER LEVEL.
11. FISH SALVAGE TO BE DONE AFTER DAM AND PUMP INSTALLATION, AND PRIOR TO TRENCHING EXCAVATION.
12. EXCAVATE TRENCH AS RAPIDLY AS POSSIBLE WITH TWO HOES EXCAVATING FROM MID CHANNEL WORKING OUTWARDS, UNLESS OTHERWISE APPROVED.
13. INSTALL PIPE.
14. BACKFILL THE STREAM CHANNEL FIRST PUSHING THE SILTED WATER BACK INTO THE BANK EXCAVATIONS, WHERE PRACTICAL. PUMP OR DRAIN THE EXCAVATIONS WHILE PROGRESSIVELY BACKFILLING AS REQUIRED. CONSTRUCT WATER CONTAINMENT SUMPS IF NECESSARY.
15. RESTORE BED AND RECLAIM BANKS OF THE STREAM CHANNEL.
16. REMOVE GREY WATER AND SEDIMENT CREATED BY INSTREAM WORK FROM THE ISOLATED AREA.
17. REMOVE THE DOWNSTREAM DAM OR VEHICLE CROSSING PLUG.
18. REMOVE UPSTREAM DAM OR VEHICLE CROSSING PLUG.
19. REMOVE BYPASS PUMPS.

NOTE:

THE CONTRACTOR SHALL SUBMIT A DETAILED WATER COURSE CROSSING PLAN TO THE COMPANY FOR REVIEW AND APPROVAL AS DIRECTED BY THE COMPANY.

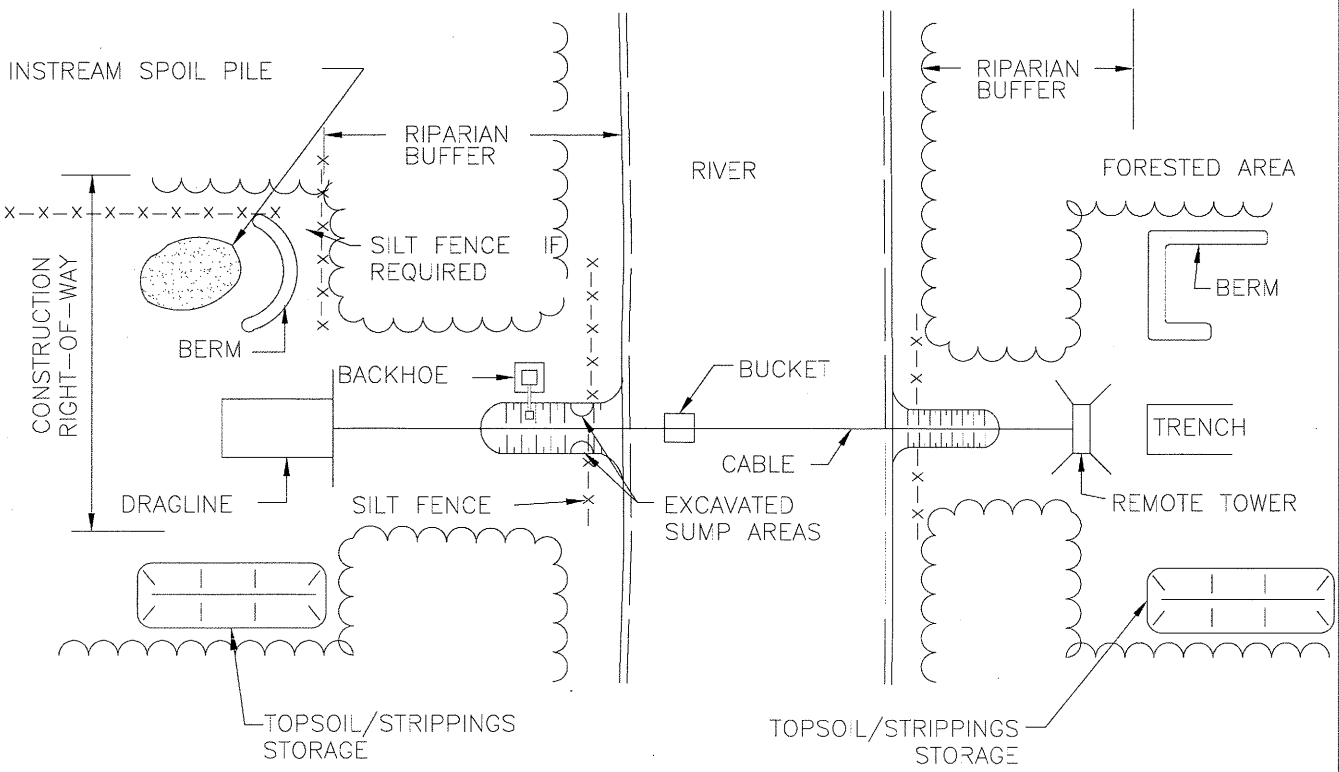
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	 <small>CHECKED BY:</small>	 <small>DESIGN CHECKER:</small>	TITLE TYPICAL DAM AND PUMP WATER COURSE CROSSING (SHEET 3 OF 3)				
		SCALE N.T.S.	DWG No	STDS-03-ML-05-112			REV 01

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REVISIONS 00 STANDARD ISSUE, SUPERCEDES A-SK-18-427 01 GENERAL ISSUE -- REVIEWED FOR 2015 SPEC



NOTES:

1. SCHEDULE INSTREAM ACTIVITY AND APPROPRIATE TIMING WINDOW, WHERE FEASIBLE.
2. CONSTRUCTION RIGHT-OF-WAY WIDTHS WILL VARY BASED ON LOCATION AND PROJECT REQUIREMENTS (e.g. PIPE SIZE, PIPE COVER, TRENCH SPOIL COMPOSITION/TRENCH STABILITY AND CORRESPONDING SPOIL CONTAINMENT AREAS, PIPE SECTIONS AND BUOYANCY CONTROL, ETC.)
3. SPOIL IS REMOVED FROM SUMP BY BACKHOE AND MOVED TO CONTAINMENT AREA BY BULL-DOZER, LOADER OR TRUCK.
4. INSTALL SILT FENCE OR APPROVED EQUIVALENT WHERE DIRECTED BY THE COMPANY, ACROSS THE RIGHT-OF-WAY ADJACENT TO THE BANKS TO MINIMIZE POTENTIAL FOR SILT INTRODUCTION IN THE WATERCOURSE FROM OVERLAND FLOW.
5. SPOIL IS USED AS BACKFILL FOLLOWING PIPE INSTALLATION BY REVERSING THE SPOIL HANDLING PROCEDURE AND THE DRAGLINE BUCKET.
6. RESTORE WATERCOURSE CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE. RESTORE, STABILIZE AND RECLAIM BANKS AND APPROACHES TO ORIGINAL GRADES AS PRACTICAL.

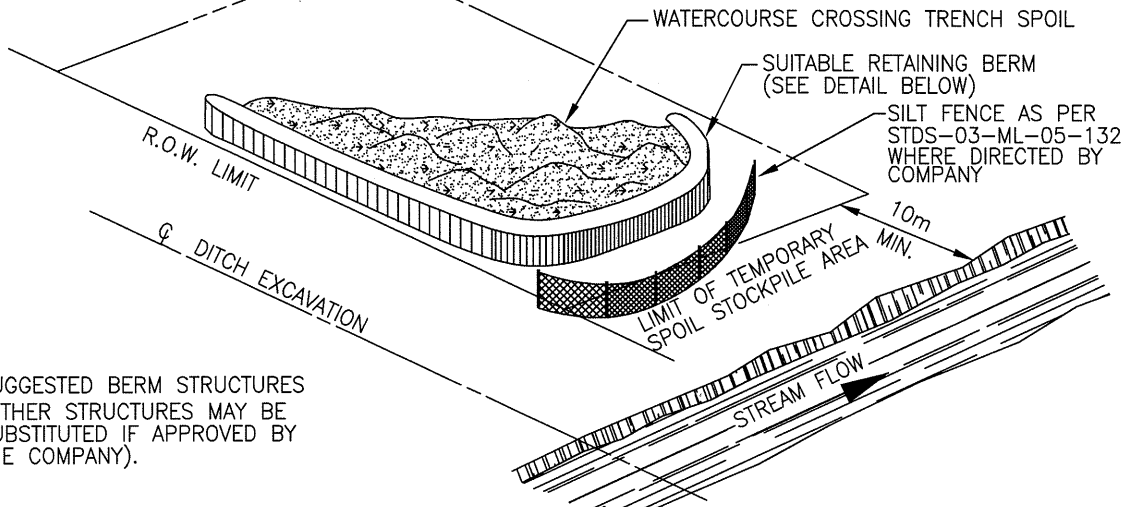
NOTE:

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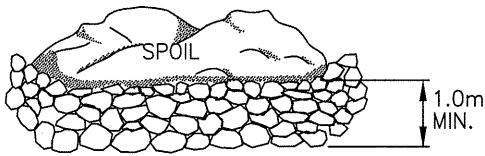
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			SCALE N.T.S.	DWG No	STDS-03-ML-05-113		REV 01	

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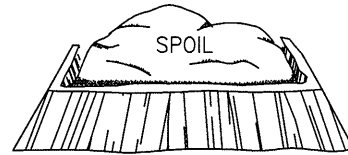
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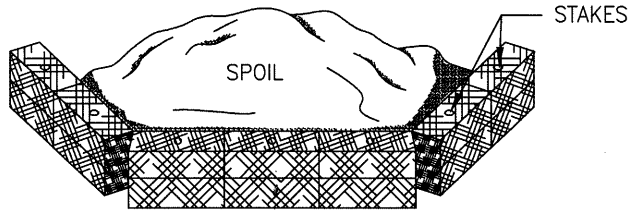
DETAILS: SUGGESTED BERM STRUCTURES (OTHER STRUCTURES MAY BE SUBSTITUTED IF APPROVED BY THE COMPANY).



1. WINDROW BOULDERS/SHOT ROCK



2. DIRT BERM



4. STAW BALES (STAKED) (IF APPROVED BY COMPANY)

NOTES:

1. CONTAINMENT BERMS ARE TO BE USED WHERE STREAM OR CREEK SPOIL COULD RE-ENTER THE WATERCOURSE DIRECTLY OR INDIRECTLY.
2. TRENCH SPOIL WHICH IS SLURRIED MUCK OR DEBRIS, SHALL BE HAULED AWAY AND NOT STOCKPILED FOR BACKFILLING. AS DIRECTED BY THE COMPANY.
3. MATERIAL USED FOR THE CONTAINMENT BERM SHALL BE A MINIMUM OF 10m FROM THE TOP OF BANK OR OTHERWISE SPECIFIED BY THE COMPANY.
4. CONSTRUCT BERM WITH SUFFICIENT HEIGHT AND WIDTH TO ENSURE ADEQUATE CONTAINMENT DURING THE CONSTRUCTION PERIOD.
5. BERMS MUST BE MAINTAINED.
6. STAGED MOVEMENT OF SOIL MAY BE REQUIRED IF QUANTITIES ARE EXCESSIVE.
7. WHERE POSSIBLE, RIPARIAN VEGETATION TO BE MAINTAINED.
8. THE CONTAINMENT BERM SHALL BE DISMANTLED AND THE SITE RESTORED TO THE ORIGINAL CONDITION UPON COMPLETION OF THE WATER CROSSING.

REVISIONS 00 STANDARD ISSUE, SUPERCEDES A-SK-18-327 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



DESIGNER:

Douglas B... June 15, 2015
NAME DATE

CHECKED BY:

DESIGN CHECKER:

[Signature] *[Signature]*

DESIGN STANDARD

FIA # STDS

CHAINAGE:

DISCIPLINE # 03

TITLE

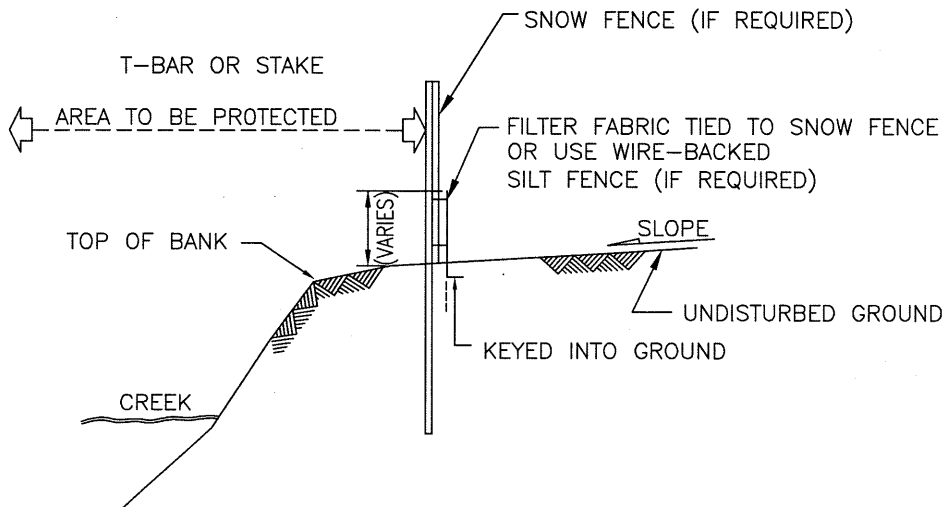
SOIL RETAINING BERM

SCALE N.T.S.

DWG No

STDS-03-ML-05-131

REV 01



SIDE VIEW
OF SILT FENCE

NOTES:

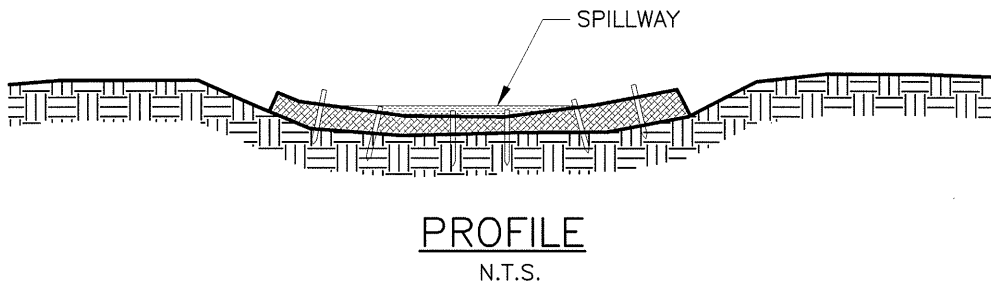
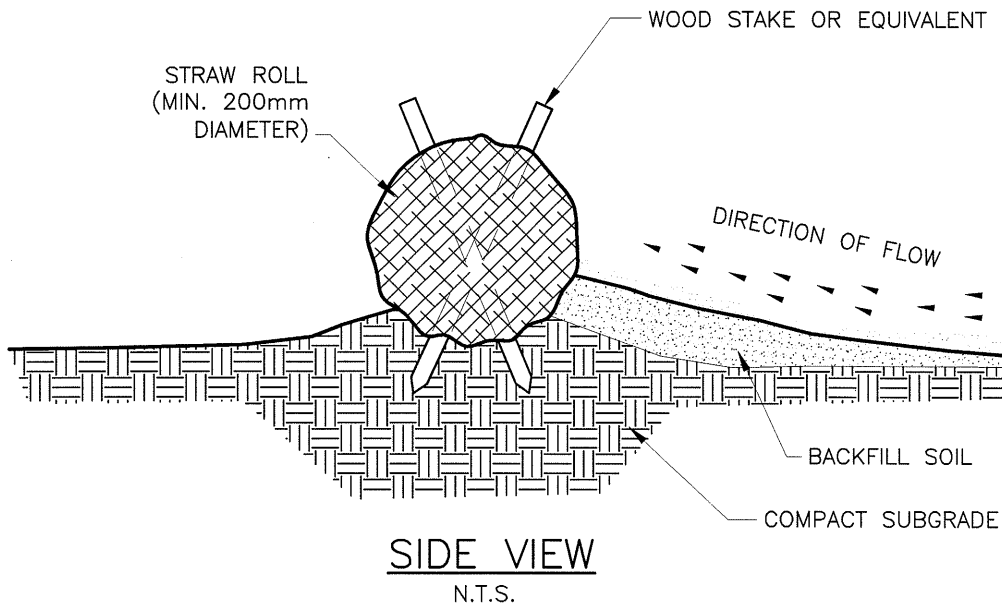
1. INSTALL SILT FENCES AS PER THE MANUFACTURES SPECIFICATIONS, UNLESS OTHERWISE DIRECTED BY THE COMPANY.
2. SILT FENCING SHALL BE KEYED INTO THE GROUND, UNLESS APPROVED BY THE COMPANY.
3. SILT FENCES ARE TO BE USED IN AREAS WHERE SHEET FLOW OR RELATIVELY SMALL VOLUMES OF WATER CAN BE EXPECTED TO OCCUR.
4. T-BAR OR STAKES ARE TO BE PLACED EVERY 3m OR CLOSER AS CONDITIONS REQUIRE.
5. WHERE POSSIBLE, RIPARAN VEGETATION IS TO BE LEFT UNDISTURBED.
6. SILT FENCE ARE TO BE CHECKED AND MAINTAINED ON A REGULAR BASIS AND TRAPPED SEDIMENT REMOVED.
7. MATERIAL TO BE EITHER A WOVEN GEOTEXTILE FABRIC SUCH AS MIRAFI 600X OR 700X OR TERRAFIX 400W, OR EQUIVALENT. BIO-DEGRADABLE MATERIALS MAY BE UTILIZED WHERE APPROVED BY THE COMPANY.
8. WHERE A SITE SPECIFIC APPLICATION OR ASSESSMENT DICTATES THE REQUIREMENT TO UTILIZE REINFORCED MATERIALS, WIRE-BACKED SILT FENCE CAN BE USED IN PLACE OF SNOW FENCE.

REVISIONS 00 STANDARD ISSUE, SUPERCEDES A-SK-18-391 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC

TIME DESIGNFILE

	DESIGNER: <i>David B...</i> NAME	DESIGN STANDARD		
	June 16, 2015 DATE	FIA # STDS	CHAINAGE:	DISCIPLINE # 03
CHECKED BY: <i>[Signature]</i>		DESIGN CHECKER: <i>[Signature]</i>		TITLE SEDIMENT CONTROL - SILT FENCE CONSTRUCTION
SCALE N.T.S.		DWG No STDS-03-ML-05-132		
				REV 01

REVISIONS 00 STANDARD ISSUE, SUPERCEDES A-SK-18-392 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



NOTES:

1. SEDIMENT CONTROL DEVICES CAN BE USED TO CONTROL EROSION IN LOCATIONS WHERE NO CHANNEL/SWALE EXISTS; OR WHERE A DEFINITE CHANNEL/SWALE EXISTS, AND ARE USEFUL IN AREAS OF LOW FLOW. WHERE LARGE VOLUMES OF WATER CAN BE EXPECTED, A MORE EXTENSIVE CHECK DAM MAY BE REQUIRED (I.E. SANDBAGS; CLEAN ROCK FILL.)
2. THE CENTER SECTION OF SANDBAGS, STRAW ROLLS, GEO-RIDGE, SILT FENCE, CLEAN ROCK OR EQUIVALENT APPROVED MATERIAL FILL WILL BE SLIGHTLY LOWER THAN THE ADJACENT SECTIONS TO PROVIDE A NATURAL SPILLWAY FOR ANY OVERFLOW.
3. INSTALL THE SEDIMENT CONTROL DEVICES (I.E. STRAW ROLL, GEO-RIDGE, SILT FENCE, ROCK, SANDBAGS OR EQUIVALENT APPROVED MATERIAL) AS PER MANUFACTURES SPECIFICATIONS AND THE COMPANY AUTHORIZED REPRESENTATIVE. SEDIMENT CONTROL DEVICES CAN BE USED IN LOCATIONS THAT ARE PARALLEL OR PERPENDICULAR TO THE FLOW (DEPENDING ON SLOPE DIRECTION).



DESIGNER:

[Signature] June 15, 2015
NAME DATE

DESIGN STANDARD

FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
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TITLE	SEDIMENT CONTROL CHECK DAM/FILTER
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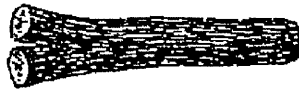
SCALE N.T.S.	DWG No STDS-03-ML-05-137	REV 01
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REVISIONS 00 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC DRAWING SUPERSEDES SK-1564

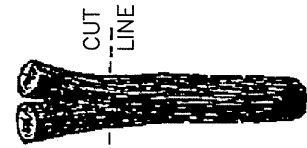
FORK



IMPROPER CUT



IMPROPER CUT



CUT BEHIND FORK

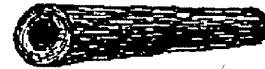
PISTOL BUTT, BUTT FLARE, BUTT ROT



CUT BEHIND DEFECT



CUT BEHIND FLARE

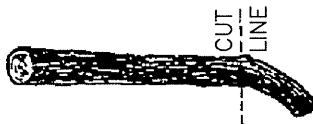


MUST BE <50% BUTT ROT

CROOK, DOG LEG



SORT TO PULP



CUT OUT EFFECT



CUT OUT EFFECT

SWEEP



UNACCEPTABLE IF > 6" IN 12' OR >18" IN TREE LENGTH



ACCEPTABLE IF <6" IN 12' OR <18" IN TREE LENGTH



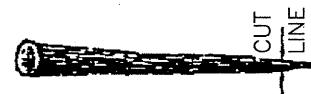
SPIRAL CHECK, LIMBS, RAT TAIL



SORT TO PULP



CUT FLUSH WITH STEM



MUST BE > 4" TOP

NOTES:

1. ALL OF THE ABOVE DEFECTS MUST BE REMOVED FROM SALVAGE WOOD UNLESS OTHERWISE SPECIFIED BY THE COMPANY'S DOCUMENTS.
2. TREE STEMS WILL BE DELIMBED INDIVIDUALLY. MULTIPLE STEMS WILL NOT BE FED THROUGH MECHANICAL DELIMBERS.



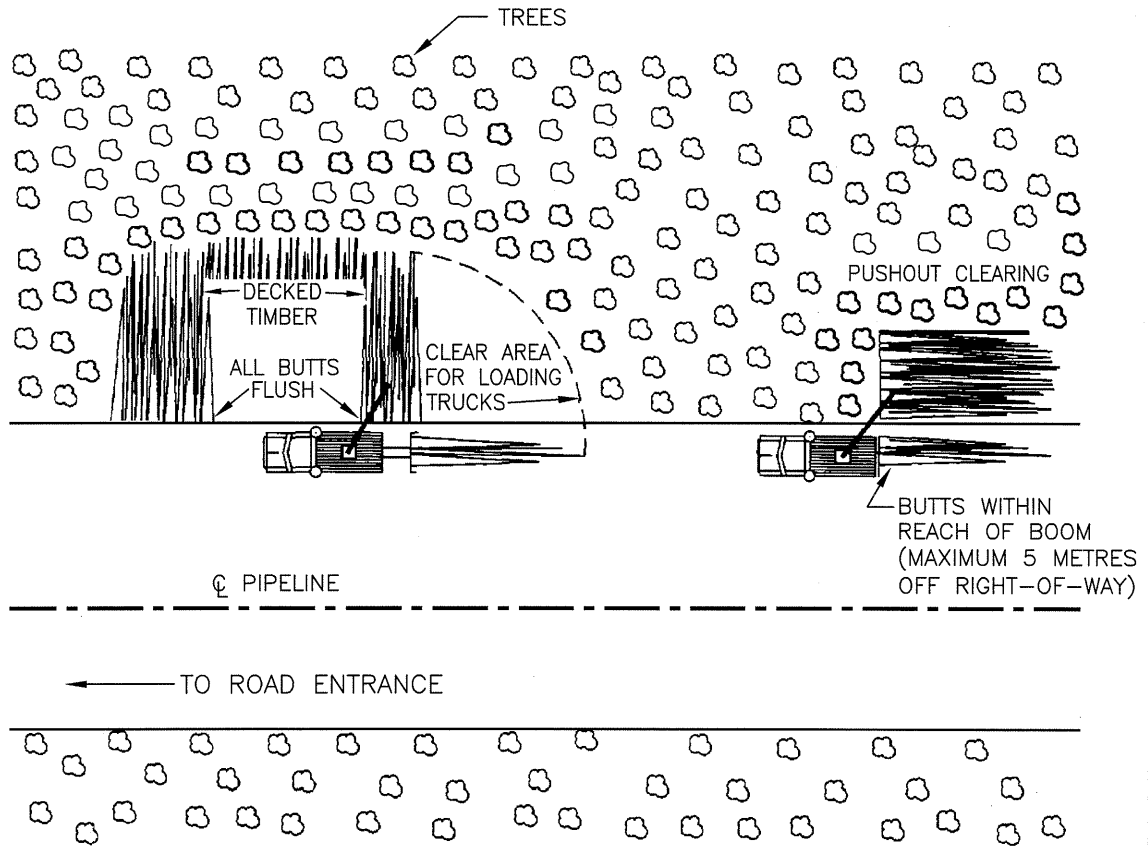
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 NAME DATE
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DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE TIMBER SALVAGE QUALITY AND DEFECTS			
SCALE N.T.S.	DWG No	STDS-03-ML-05-301	REV 01

TC_A4_EE.DWG 210X280

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

01 GENERAL ISSUE -- REVIEWED FOR 2015 SPEC
 00 STANDARD ISSUE, SUPERCEDES A-SK-18-392
 REVISIONS



PLAN VIEW
N.T.S.

NOTES:

1. SALVAGE MERCHANTABLE TIMBER AS DIRECTED BY THE COMPANY USING CUTOFF TYPE SAW EQUIPMENT. DO NOT BULLDOZE MERCHANTABLE TIMBER.
2. LOGS SHALL NOT BE SKIDDED ACROSS WATERCOURSES, UNLESS A SUITABLE CROSSING STRUCTURE HAS BEEN INSTALLED.
3. TIMBER IS TO BE SKIDDED TO THE PROCESSOR OR DELIMBER OUTSIDE OF THE LOG DECK. LIMBS AND TOPS SHALL NOT BE STORED INSIDE THE LOG DECK, UNLESS APPROVED BY THE COMPANY. SALVAGE LOGS SHALL HAVE LIMBS TRIMMED FLUSH WITH THE STEMS. TIMBER SHALL NOT BE SKIDDED THROUGH MUD OR GRAVEL.
4. DECK FACES MUST BE KEPT STRAIGHT AND FLUSH.
5. PERPENDICULAR DECK FACE MUST BE WITHIN 3 METERS OF THE RIGHT-OF-WAY OR ROAD. PARALLEL DECKS MUST BE WITHIN 5 METERS OF THE RIGHT-OF-WAY OR ROAD.
6. PRIME CONTRACTOR SHALL MAINTAIN ACCESS ALONG THE RIGHT-OF-WAY AND SALVAGED TIMBER SHALL BE REMOVED FROM THE PROJECT PRIOR TO PIPE STRINGING ACTIVITIES, WHERE POSSIBLE.
7. CONIFEROUS AND DECIDUOUS TIMBER SALVAGE WILL BE DECKED IN SEPARATE PILES.



DESIGNER:

Douglas B... June 15, 2015
NAME DATE

CHECKED BY:

DESIGN CHECKER:

DESIGN STANDARD

FIA #STDS

CHAINAGE:

DISCIPLINE # 03

TITLE

SALVAGE OF MERCHANTABLE
TIMBER

SCALE N.T.S.

DWG No

STDS-03-ML-05-302

REV 01

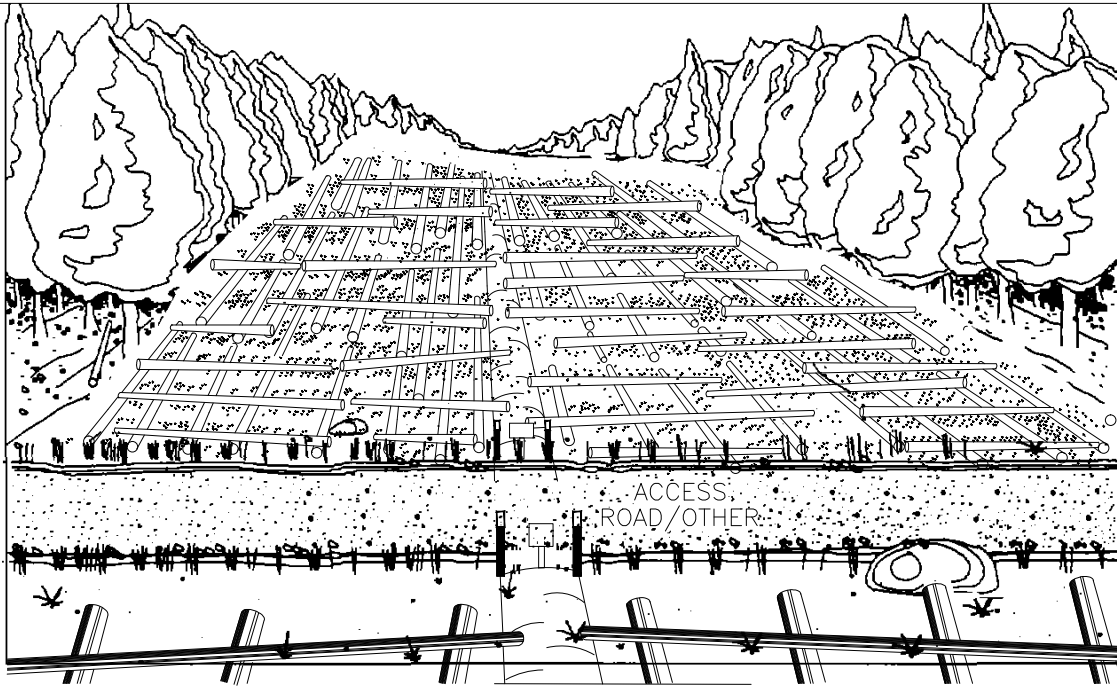
01 PBAS RE-ISSUED (06-03-2022)

01

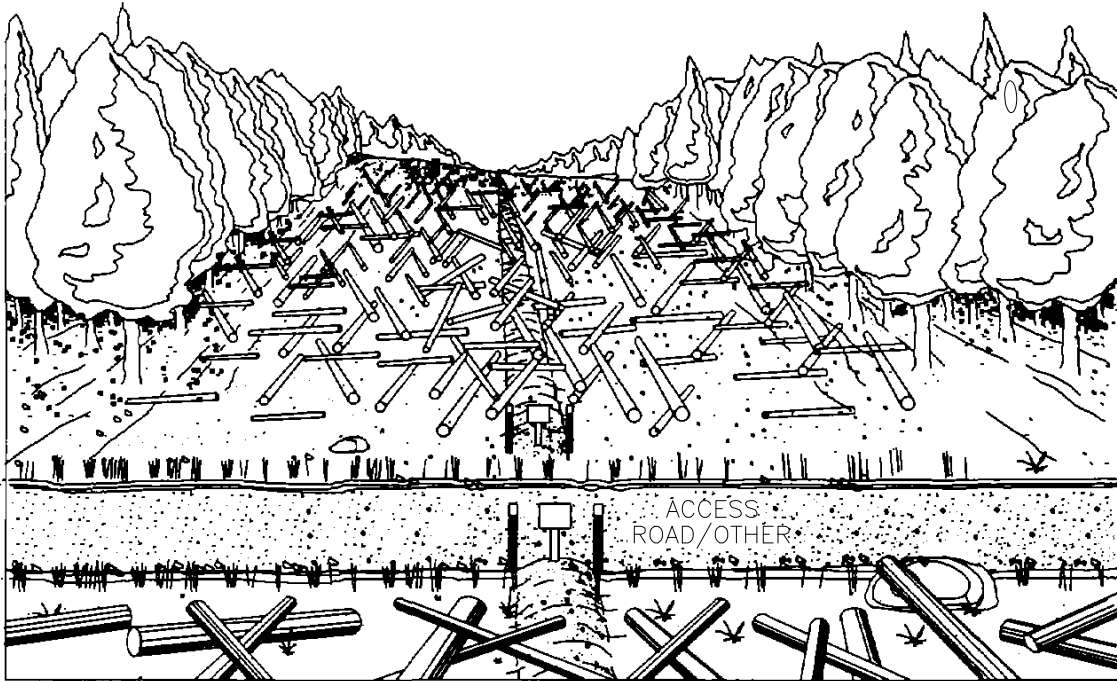
ISSUED PBAS

00

REVISIONS



OPTION A



OPTION B

1. PLACE ROLLBACK AS INDICATED ON THE DRAWING (OPTION A OR B). REFER TO THE EPP FOR SITE SPECIFIC DETAILS. THE COMPANY'S AUTHORIZED REPRESENTATIVE WILL DETERMINE THE OPTION AND LOCATION OF ROLLBACK TO FIT WITHIN THE RIGHT-OF-WAY.
2. ENSURE ROLLBACK IS EXTENDED TO THE TRENCH ROACH AND TO THE EDGE OF THE CONSTRUCTION FOOTPRINT (STANDING TIMBER WHERE APPLICABLE). TO ENSURE EFFECTIVENESS, THE ROLLBACK SHALL BE BETWEEN 50 AND 100 M IN LENGTH AS DIRECTED BY THE COMPANY'S AUTHORIZED REPRESENTATIVE. IN CARIBOU AREAS ROLLBACK LENGTH SHALL BE BETWEEN 50-250 M. ROLLBACK DENSITY SHALL BE BETWEEN 150 AND 300 M3/HA IN ALL AREAS.
3. IF SITE CONDITIONS WARRANT MODIFICATIONS TO THE PROCEDURE, THE COMPANY'S AUTHORIZED REPRESENTATIVE SHALL ENSURE THE MODIFICATIONS MEET THE INTENT OF THE MITIGATION MEASURE.



DESIGNER:

WADE PRUETT 2022-06-03
NAME DATE

CHECKED BY: DESIGN CHECKER:
VC JH

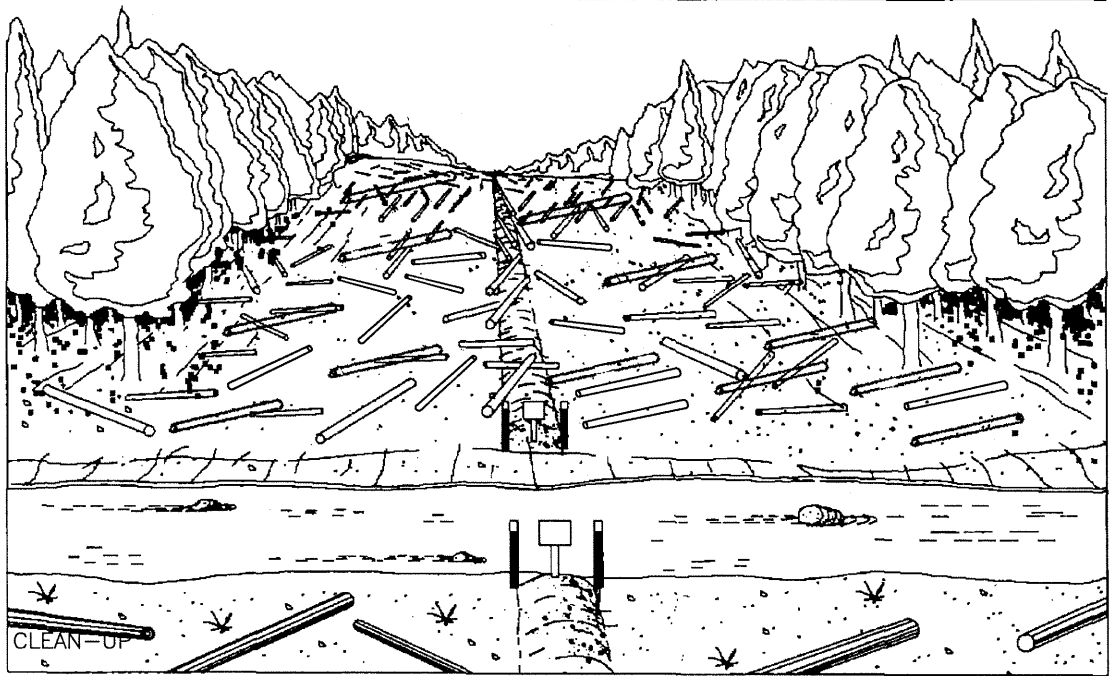
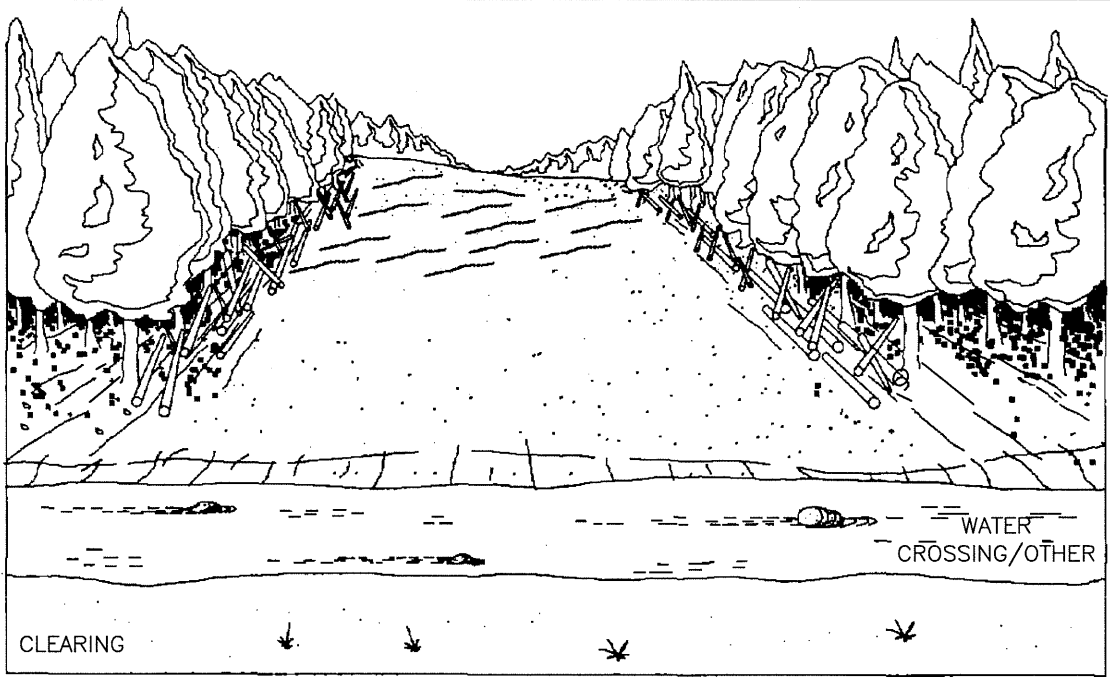
PIPELINE FACILITIES BASE DRAWINGS - CANADA

FIA # PBAS CHAINAGE: DISCIPLINE # 03

TITLE
TYPICAL ROLLBACK
FOR ACCESS CONTROL

SCALE N.T.S. DWG No PBAS-03-ML-05-312 REV 01

REVISIONS 00 DRAWING SUPERSEDES SK-1555 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



NOTES:

1. WINDROW WOODY DEBRIS ON SIDES OF RIGHT-OF-WAY, OR WHERE APPROVED BY THE COMPANY.
2. MAINTAIN EXISTING ACCESS RIGHTS-OF-WAY THROUGH ROLLBACK (i.e. TRAILS, SEISMIC LINES).
3. ROLLBACK SHOULD BE EVENLY DISTRIBUTED OVER RIGHT-OF-WAY AND COMPACTED WITH A DOZER, OR OTHER APPROVED EQUIPMENT.



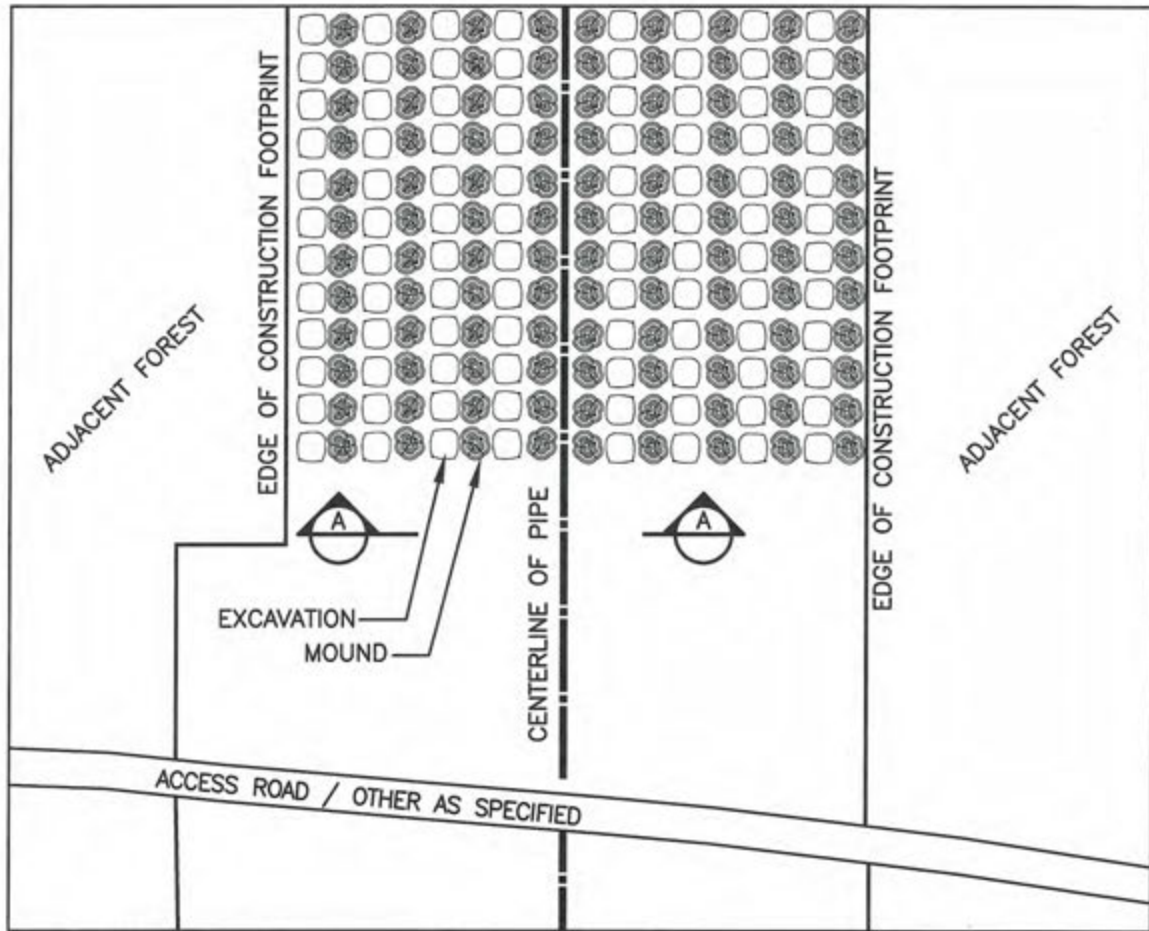
DESIGNER: *June 16, 2015*
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 NAME DATE

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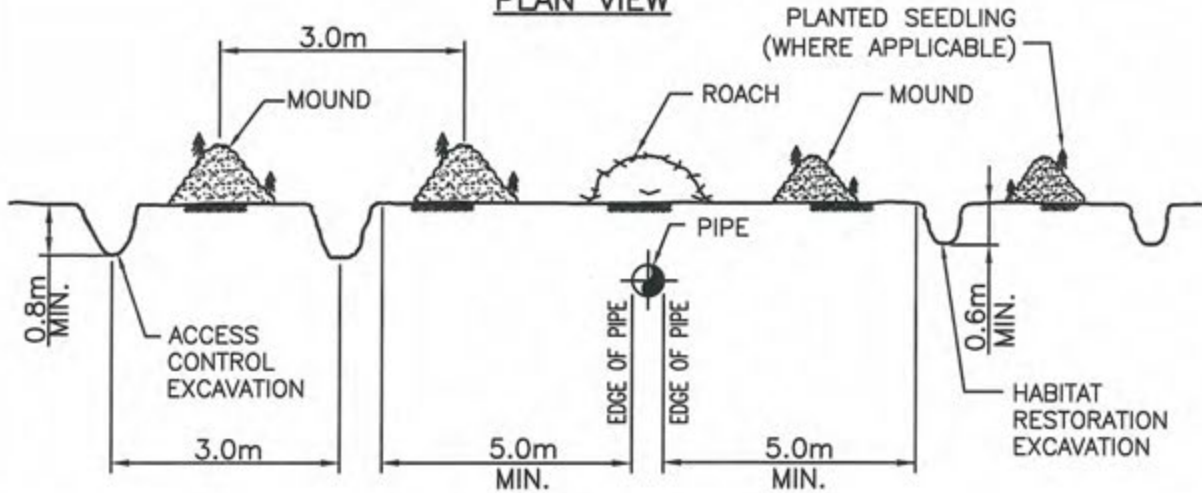
DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE TYPICAL ROLLBACK FOR EROSION CONTROL			
SCALE N.T.S.		DWG No STDS-03-ML-05-313	REV 01

TC_A4_EE.DWG 210X280

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



PLAN VIEW



CROSS SECTION A-A

REVISIONS 00 STANDARD ISSUED (2016-11-22) KPL



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DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE MOUNDING AND HABITAT RESTORATION (SHEET 1 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-314	REV 00

TC_A4_EE.DWG 210X280

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

NOTES:

1. MOUNDING WILL BE USED PRIMARILY FOR ACCESS CONTROL IN AREAS SPECIFIED ON PROJECT PLANS, AND AS DIRECTED BY THE COMPANY. MOUNDING WILL BE COMBINED WITH HABITAT RESTORATION MEASURES WHERE INDICATED IN PROJECT PLANS, AND AS DIRECTED BY THE COMPANY.
2. EXCAVATIONS SHALL NOT BE CONDUCTED WITHIN 5m OF THE COMPANY'S PIPELINE. ENSURE APPLICABLE COMPANY AND THIRD PARTY PERMITS AND AGREEMENTS ARE IN PLACE AND ADHERED TO.
3. THE EDGE OF THE EXCAVATION SHALL BE JUST BEYOND THE 5m BUFFER LIMIT AND THE MOUND SHALL BE PLACED WITHIN THE 5m BUFFER LIMIT ADJACENT TO THE COMPANY'S PIPELINE.
4. FOR ACCESS CONTROL PURPOSES, THE EXCAVATED AREA SHALL BE MINIMUM 0.8m DEEP AND APPROXIMATELY 1m IN DIAMETER, WHERE SITE CONDITIONS ALLOW.
5. WHERE MOUNDING IS COMBINED WITH HABITAT RESTORATION MEASURES, THE EXCAVATED AREA SHALL BE APPROXIMATELY 0.6m DEEP AND APPROXIMATELY 1m IN DIAMETER, WHERE SITE CONDITIONS ALLOW.
6. THE EXCAVATED MATERIAL IS PLACED BESIDE THE HOLE TO CREATE THE MOUND.
7. MOUNDS SHALL BE SPACED APPROXIMATELY 3m APART, WITH FINAL SPACING IMPLEMENTED TO ENSURE ACCESS BY OFF-ROAD VEHICLES IS DETERRED.
8. DENSITY SHALL BE A MINIMUM OF 700 MOUNDS/HA. MOUND DENSITY IS DEPENDENT ON SOIL CHARACTERISTICS, AMOUNT OF FROST AND TYPE OF EQUIPMENT USED. TYPICAL LENGTH OF MOUNDING TO MEET THE MINIMUM DENSITY IS APPROXIMATELY 50m.
9. WHERE MOUNDING IS COMBINED WITH HABITAT RESTORATION MEASURES, LIVE SEEDLING PLANTING DENSITY SHALL BE A MINIMUM OF 2 SEEDLINGS PER MOUND, OR 1,400 TO 2,000 SEEDLINGS/HA.
10. IF SITE CONDITIONS WARRANT MODIFICATIONS TO THE PROCEDURE, THE COMPANY'S AUTHORIZED REPRESENTATIVE SHALL ENSURE THE MODIFICATIONS MEET THE INTENT OF THE MITIGATION MEASURE.

GENERAL:

- MOUNDING IS TYPICALLY CONDUCTED DURING FINAL CLEANUP AND NOT IN THE SAME SEASON AS CONSTRUCTION/ INTERIM CLEANUP.
- PRECAUTIONS SHALL BE TAKEN TO MINIMIZE FROST PENETRATION WHERE PRACTICAL IN AREAS WHERE MOUNDING IS SPECIFIED. DEEPER FROST PENETRATION CAN LIMIT THE ABILITY TO EXCAVATE HOLES AND SUBSEQUENT EFFECTIVENESS OF THE MITIGATION MEASURES.
- SITE SPECIFIC SOIL PROPERTIES (E.G. SUBSTRATE AND DRAINAGE) MAY AFFECT THE HOLE AND MOUND SIZE, STABILITY AND OVERALL STRUCTURE.
- MOUNDING MAY ALSO BE USED IN COMBINATION WITH HABITAT RESTORATION BY CREATING MICROSITES FOR PLANTED SEEDLINGS.

REVISIONS 00 STANDARD ISSUED (2017-05-10) KPL

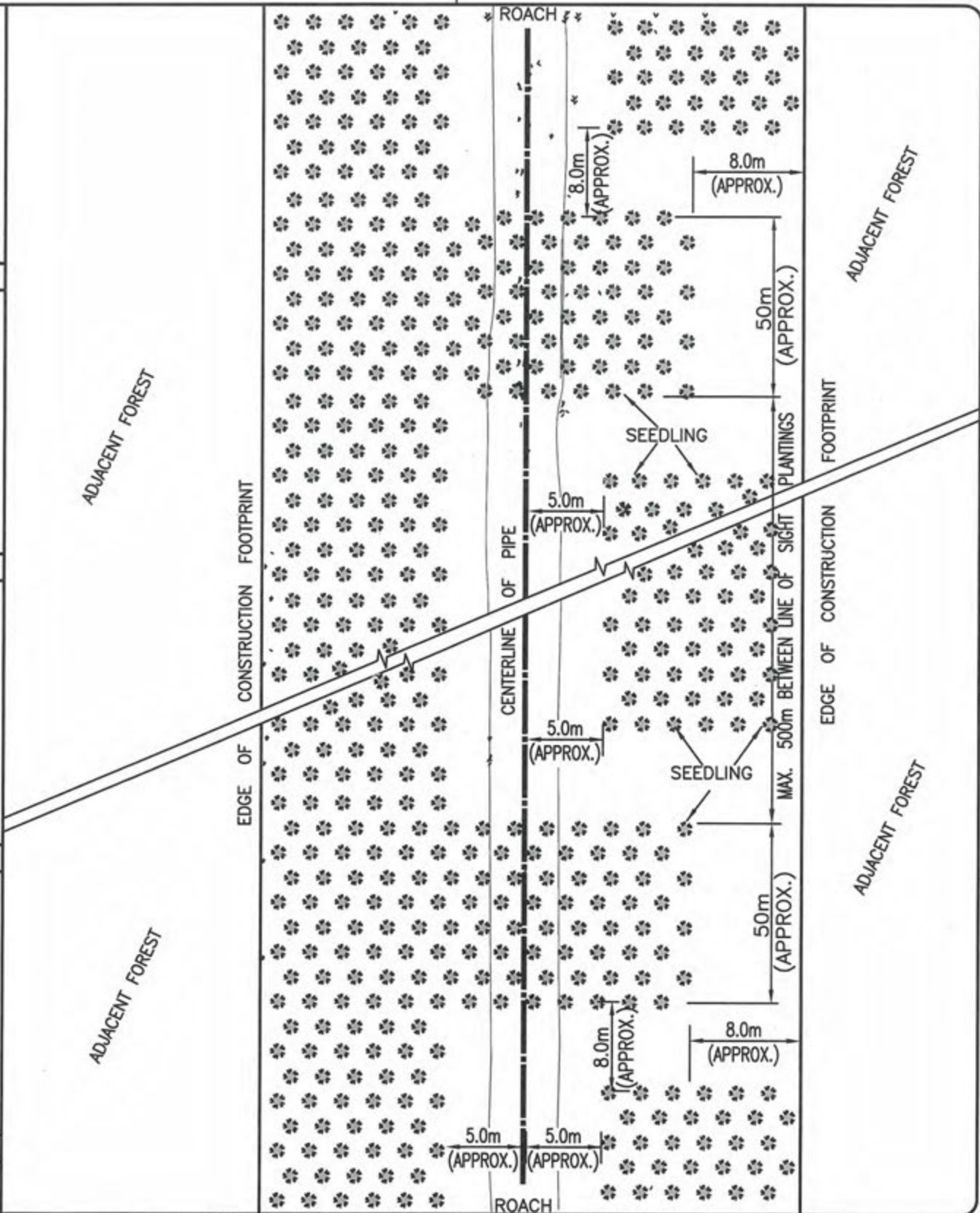


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<i>[Signature]</i>	<i>JH</i>

DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE MOUNDING AND HABITAT RESTORATION (SHEET 2 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-315	REV 00

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REVISIONS 00 STANDARD ISSUED (2016-11-22) KPL



DESIGNER:
M.S.A.
 NAME DATE *Aug 17/17*

CHECKED BY: *[Signature]* DESIGN CHECKER: *JH*

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE HABITAT RESTORATION SEEDLING PLANTING FOR LINE OF SIGHT (SHEET 1 of 3)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-316	REV 00

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CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

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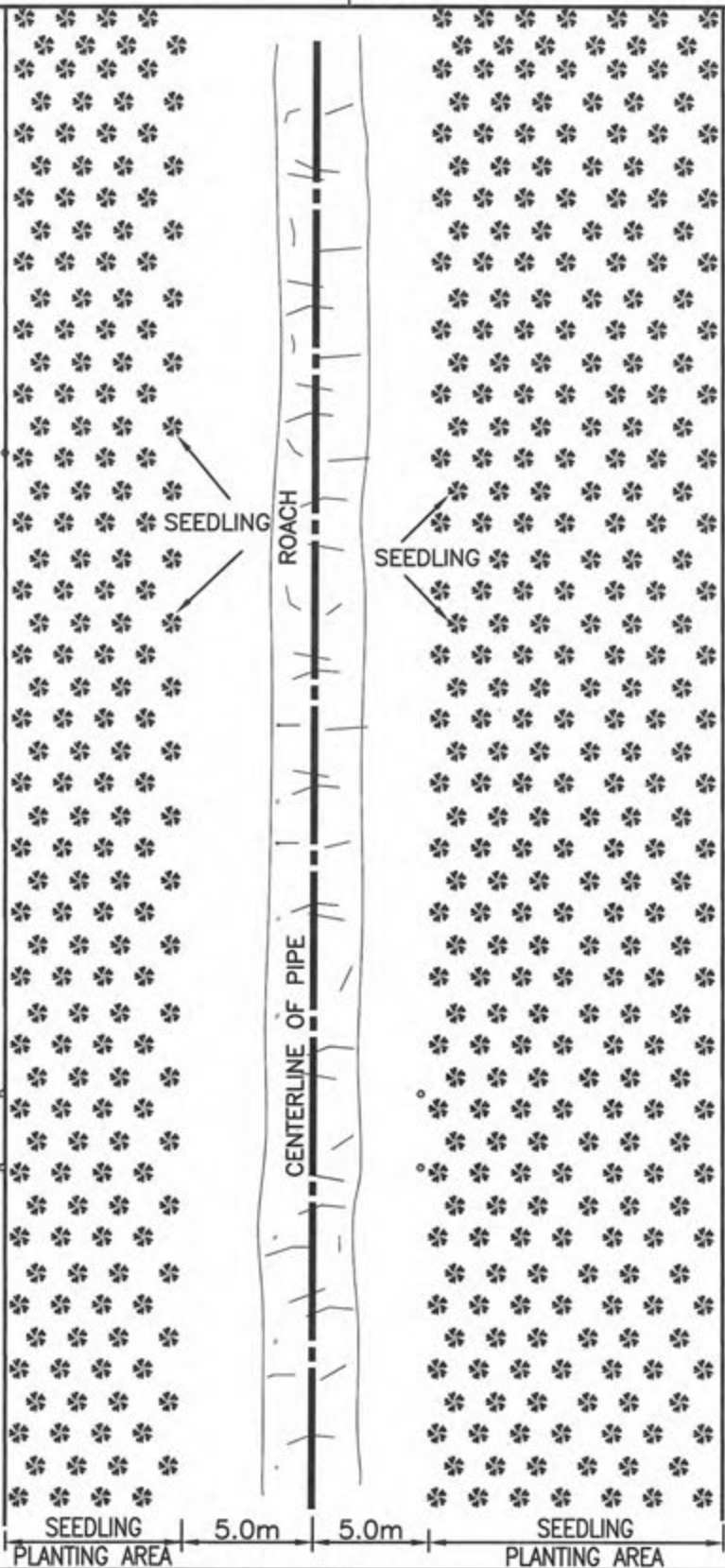
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REVISIONS 00 STANDARD ISSUED (2016-11-22) MPL

ADJACENT FOREST

ADJACENT FOREST

EDGE OF CONSTRUCTION FOOTPRINT



ADJACENT FOREST

ADJACENT FOREST

EDGE OF CONSTRUCTION FOOTPRINT

SEEDLING PLANTING AREA

SEEDLING PLANTING AREA

5.0m

5.0m



DESIGNER: *M.S. Smith* *Aug 12/13*

CHECKED BY: *[Signature]* DESIGN CHECKER: *JH.*

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE HABITAT RESTORATION SEEDLING PLANTING (SHEET 2 OF 3)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-317	REV 00

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

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NOTES:

1. CONDUCT SEEDLING PLANTING FOR HABITAT RESTORATION AND LINE OF SIGHT WHERE INDICATED IN PROJECT PLANS, AND AS DIRECTED BY THE COMPANY.
2. ENSURE APPLICABLE COMPANY AND THIRD PARTY AGREEMENTS ARE IN PLACE AND FOLLOWED.
3. SEEDLING PLANTING SHALL BE CONDUCTED IN NON-FROZEN GROUND CONDITIONS IN THE SEASON FOLLOWING WINTER FINAL CLEANUP, AND OUTSIDE OF APPLICABLE RESTRICTED ACTIVITY PERIODS WHERE WAIVERS ARE NOT OBTAINED.
4. DO NOT PLANT IN THE SEASON FOLLOWING CONSTRUCTION/ INTERIM CLEANUP UNLESS APPROVED IN PROJECT PLANS OR DIRECTED BY THE COMPANY.
5. SEEDLING PLANTING DENSITY SHALL BE (A) 1,600-2,000 STEMS PER HA IN UPLAND (CONIFER /DECIDUOUS); (B) 1,200-2,000 STEMS PER HA IN LOWLAND (CONIFER ONLY). PLANT IN A STRAIGHT LINE PARALLEL TO THE ROACH. OFF-SET THE ADJACENT PARALLEL LINE OF PLANTING TO AVOID A GRID PATTERN.
6. WHERE THE LINE OF SIGHT PROCEDURE IS REQUIRED, IT SHOULD BE IMPLEMENTED AT MAXIMUM 500m SPACING OR AS DIRECTED BY THE COMPANY. TO ADDRESS ACCESS REQUIREMENTS DURING PIPELINE OPERATIONS, THE LINE OF SIGHT PLANTING PATTERN SHALL ENSURE AN APPROXIMATE 8m WIDE GAP IS LEFT UNPLANTED ADJACENT TO THE EDGE OF THE CONSTRUCTION FOOTPRINT. WHERE ACCESS IS REQUIRED ADJACENT TO THE OPERATING PIPELINE, PLANTING SHALL NOT BE CONDUCTED WITHIN 5m OF THE PIPELINE.
7. SEE DRAWING STDS-03-ML-05-316 AND STDS-03-ML-05-317 FOR EXAMPLES OF THE ALTERNATING PLANTING PATTERN AND LAYOUT TO BE APPLIED FOR HABITAT RESTORATION AND LINE OF SIGHT LOCATIONS.
8. ALTERNATING PLANTING PATTERN SHALL BE APPROXIMATELY 50m IN LENGTH OR AS INDICATED BY THE COMPANY TO MEET THE INTENT OF THE LINE OF SIGHT REQUIREMENTS.
9. IF SITE CONDITIONS WARRANT MODIFICATIONS TO THE PROCEDURE, THE COMPANY'S AUTHORIZED REPRESENTATIVE SHALL ENSURE THE MODIFICATIONS MEET THE INTENT OF THE HABITAT RESTORATION MITIGATION MEASURES.

ID - STANDARD ISSUED (2016-11-22) KPL

TIME - DESIGNFILE

	DESIGNER:		DESIGN STANDARD			
	 <small>NAME DATE</small>		FIA # STDS	CHAINAGE:	DISCIPLINE # 03	
CHECKED BY:		DESIGN CHECKER:		TITLE HABITAT RESTORATION AND LINE OF SIGHT SEEDLING PLANTING NOTES (SHEET 3 OF 3)		
 <small>NAME DATE</small>		 <small>NAME DATE</small>				SCALE N.T.S.

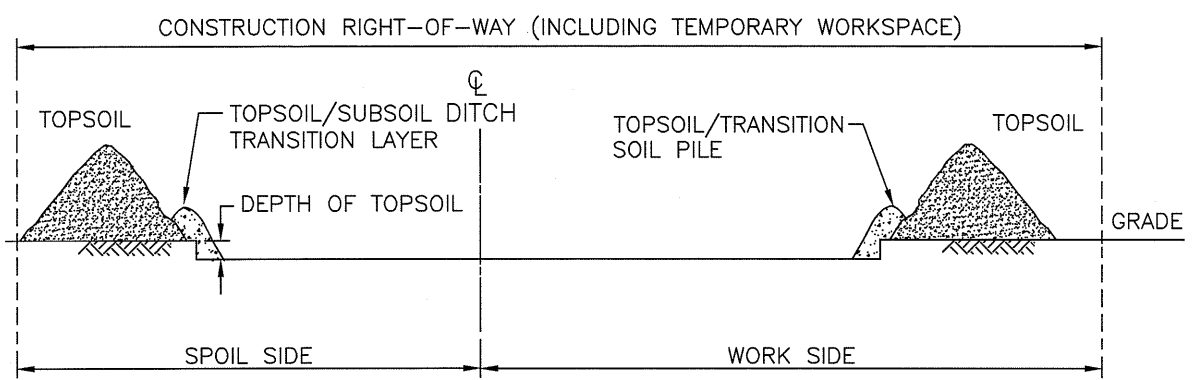
GENERAL ISSUE -- REVIEWED FOR 2015 SPEC.

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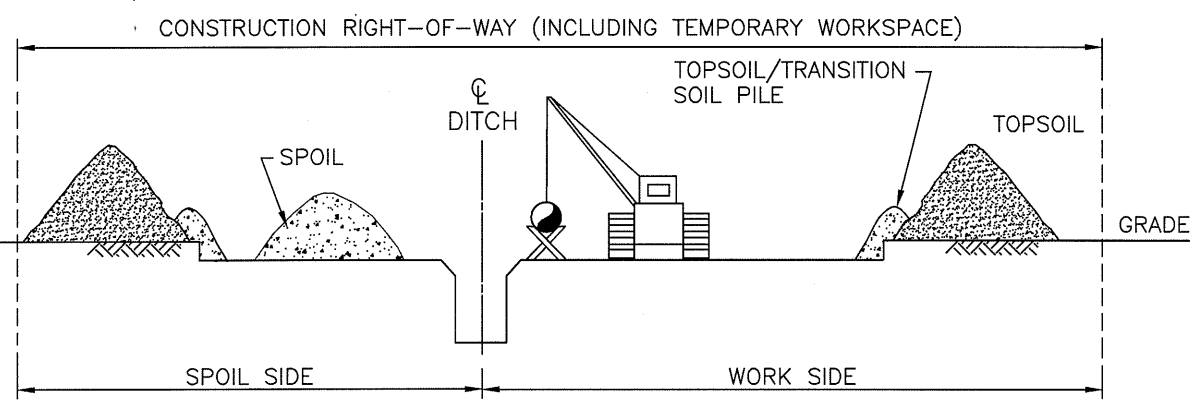
DRAWING SUPERSEDES SK-1608 (1 OF 2)

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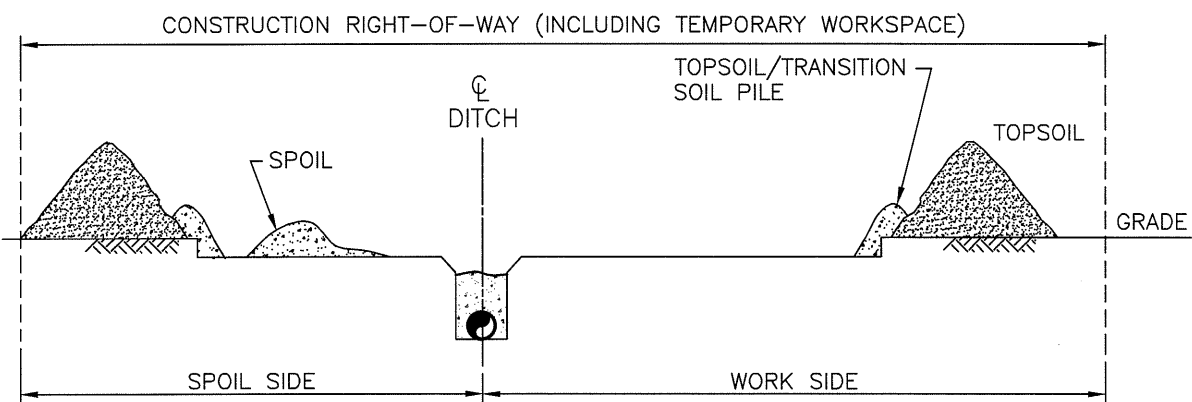
REVISIONS



1. STRIP TOPSOIL AND TOPSOIL/SUBSOIL TRANSITION LAYER FROM SPOIL AND WORK AREAS. PLACE TOPSOIL IN TEMPORARY WORK SPACE ON OUTSIDE EDGES OF RIGHT-OF-WAY. HOWEVER, IN AREAS OF THICKER TOPSOILS, TOPSOIL MAY BE SPLIT TO BOTH SIDES OF THE RIGHT OF WAY. APPLY TOPSOIL STABILIZERS TO TOPSOIL PILE.



2. EXCAVATE TRENCH



3. PIPE LOWERING AND BACKFILL TRENCH AS PER APPROVED PROCEDURE.



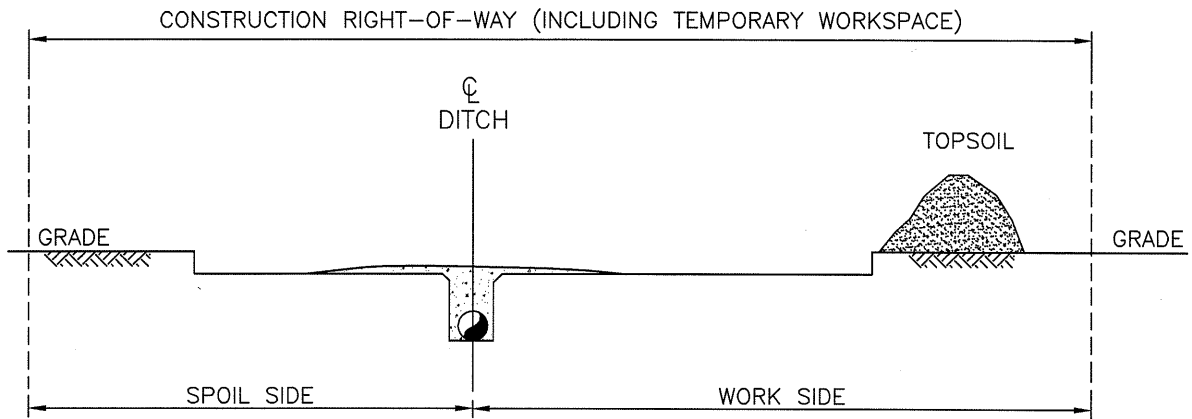
DESIGNER:
Douglas B... June 15, 2015
 NAME DATE
 CHECKED BY: *[Signature]* DESIGN CHECKER: *[Signature]*

DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE		TOPSOIL CONSERVATION FULL-WIDTH STRIPPING (SHEET 1 OF 2)	
SCALE N.T.S.	DWG No	STDS-03-ML-05-401	REV 01

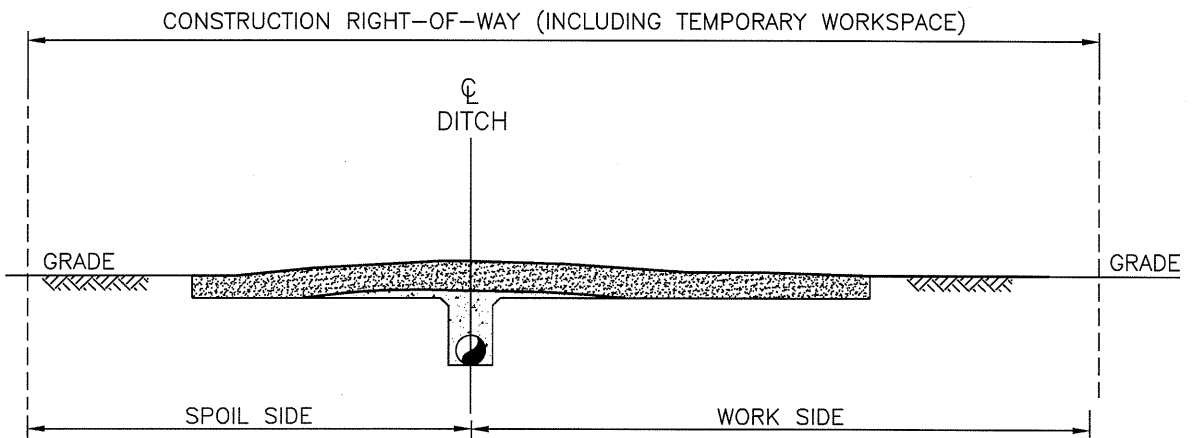
TC_A4_EE.DWG 210X280

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

REVISIONS 00 DRAWING SUPERSEDES SK-1609 (2 OF 2) 01 GENERAL ISSUE -- REVIEWED FOR 2015 SPEC.



4. COMPACT ROACH INTO DITCH AS PER APPROVED PROCEDURE.



5. REPLACE TOPSOIL/SUBSOIL TRANSITION LAYER UNIFORMLY, FOLLOWED BY REPLACEMENT OF THE TOPSOIL EVENLY OVER STRIPPED AREA, AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

NOTE:

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.



DESIGNER:

[Signature] June 15, 2015
 NAME DATE

CHECKED BY:

DESIGN CHECKER:

[Signature]

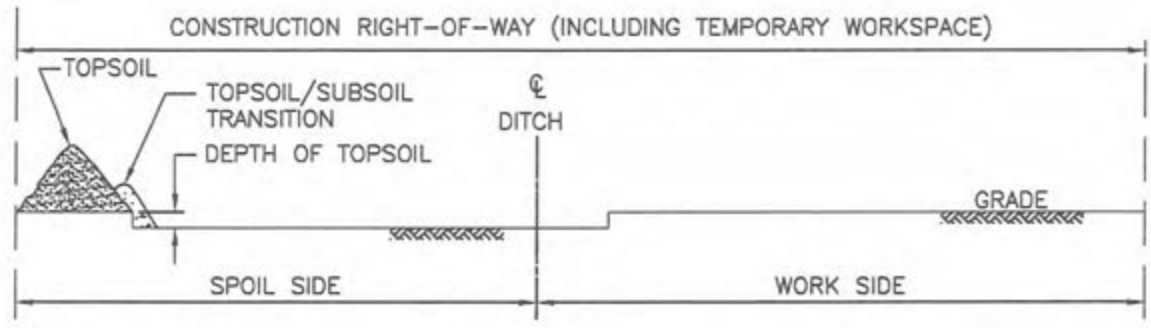
DESIGN STANDARD

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TITLE
 TOPSOIL CONSERVATION
 FULL-WIDTH STRIPPING
 (SHEET 2 OF 2)

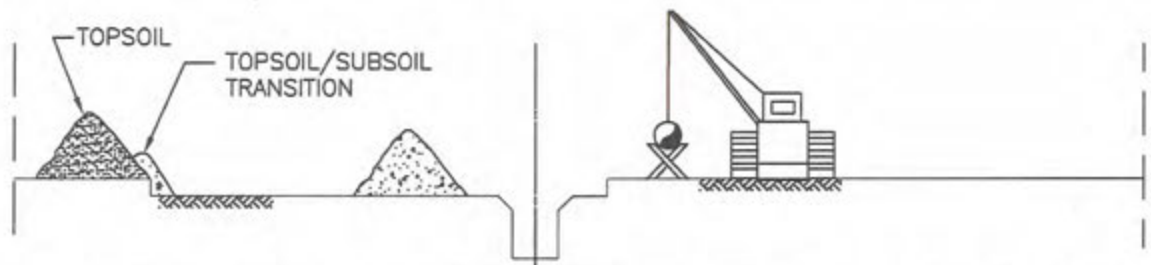
SCALE N.T.S. DWG No STDS-03-ML-05-401 REV 01

02 ISSUED FOR UPDATE 07-25-2018
 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC
 00 DRAWING SUPERSEDES SK-1405
 REVISIONS

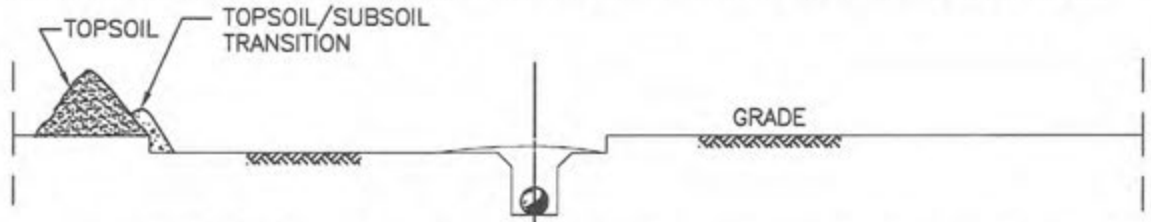


1. STRIP TOPSOIL AND TOPSOIL/SUBSOIL TRANSITION LAYER AND STOCKPILE AT EDGE OF RIGHT-OF-WAY. APPLY TOPSOIL STABILIZERS TO TOPSOIL PILE, AS REQUIRED.

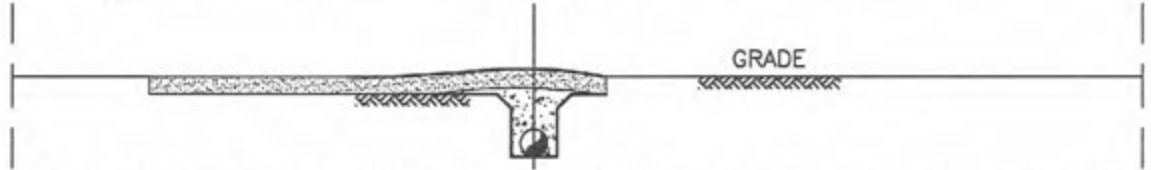
SPECIAL ATTENTION IS NECESSARY TO ENSURE SEPARATION OF TOPSOIL AND SUBSOIL AT SIDE BENDS AND FOREIGN PIPELINE CROSSINGS.



2. AS SUBSOIL IS STOCKPILED, MAINTAIN SEPARATION BETWEEN TOPSOIL AND SUBSOIL PILES.



3. LOWER-IN PIPE, BACKFILL, AND COMPACT TRENCH PER APPROVED COMPACTION PROCEDURE. RELIEVE AREAS OF COMPACTION, AND FEATHER MATERIAL OVER STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DO NOT EXCEED 10cm. WHERE DITCHLINE AND SPOIL SIDE TOPSOIL CONSERVATION IS UTILIZED UNDER FROZEN GROUND CONDITIONS, BACKFILL THE PIPE ONLY. SECONDARY STRIPPING FOR SPOIL DISPLACEMENT WILL BE REQUIRED UNDER NON-FROZEN GROUND CONDITIONS. REFER TO STDS-03-ML-05-431.



4. REPLACE TOPSOIL/SUBSOIL TRANSITION LAYER UNIFORMLY, FOLLOWED BY REPLACEMENT OF TOPSOIL EVENLY OVER STRIPPED AREA. PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

APPLICATION:

1. AGRICULTURAL LAND AND WHERE DIRECTED BY THE COMPANY.



DESIGNER:
[Signature]
 NAME DATE 28/7/10 23
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DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE		TOPSOIL CONSERVATION DITCHLINE AND SPOIL SIDE	
SCALE N.T.S.	DWG No	STDS-03-ML-05-402	REV 02

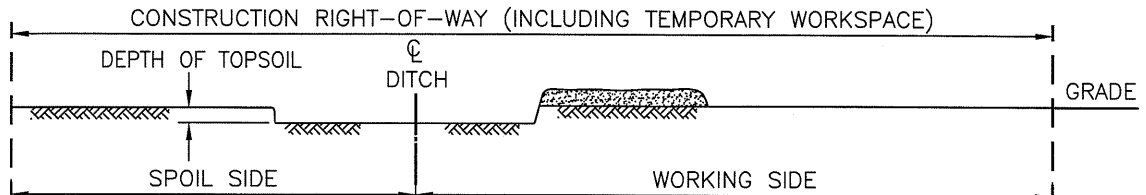
GENERAL ISSUE - REVIEWED FOR 2015 SPEC.

01

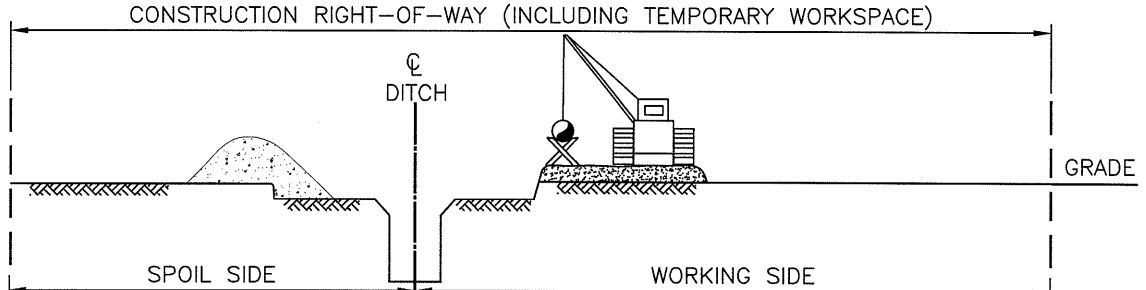
DRAWING SUPERSEDES SK-1405

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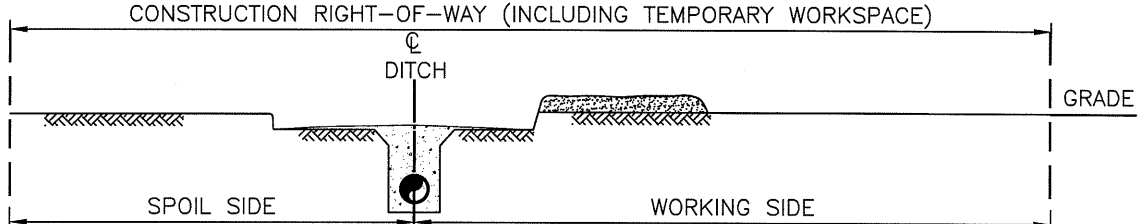
REVISIONS



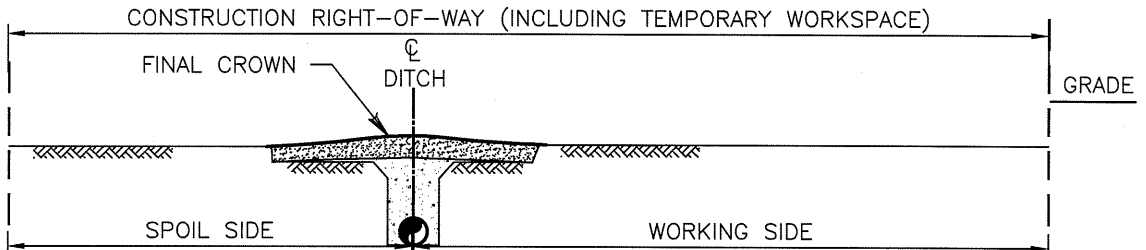
1. STRIP TOPSOIL BLADEWIDTH OVER DITCHLINE AND PORTIONS OF SPOILSIDE AND WORKSIDE (VARIABLE WIDTH AS APPROVED BY THE COMPANY) AREA. STORE TOPSOIL ON WORKING SIDE.



2. TRENCH AND PILE ON SPOILSIDE, OVERLAPPING ON STRIPPED AND UNSTRIPPED AREA



3. LOWER-IN PIPE, THEN REMOVE SUBSOIL FROM SOD LAYER OR FROZEN SOIL AND BACKFILL OVER DITCHLINE AND COMPACT AS PER APPROVED PROCEDURE.



4. REPLACE TOPSOIL AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

NOTES:

SECONDARY STRIPPING MAY BE REQUIRED TO ENSURE FINAL CROWN HEIGHT DOES NOT EXCEED LANDOWNER AND REGULATORY APPROVALS.

IF USED AS A WINTER SOIL HANDLING PROCEDURE, BACKFILL TRENCH ONLY AND DO NOT REPLACE TOPSOIL UNTIL THE FOLLOWING SUMMER, OR IN A TIMEFRAME APPROVED BY THE COMPANY.

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.

APPLICATION:

1. WHERE DIRECTED BY COMPANY.
2. PARALLEL OR NON-PARALLEL PIPELINE LOCATIONS.



DESIGNER:

Douglas B June 15, 2015
NAME DATE

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DESIGN CHECKER:

[Signature]

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DESIGN STANDARD

FIA #

STDS

CHAINAGE:

DISCIPLINE #

03

TITLE

TOPSOIL CONSERVATION
BLADE WIDTH

SCALE

N.T.S.

DWG No

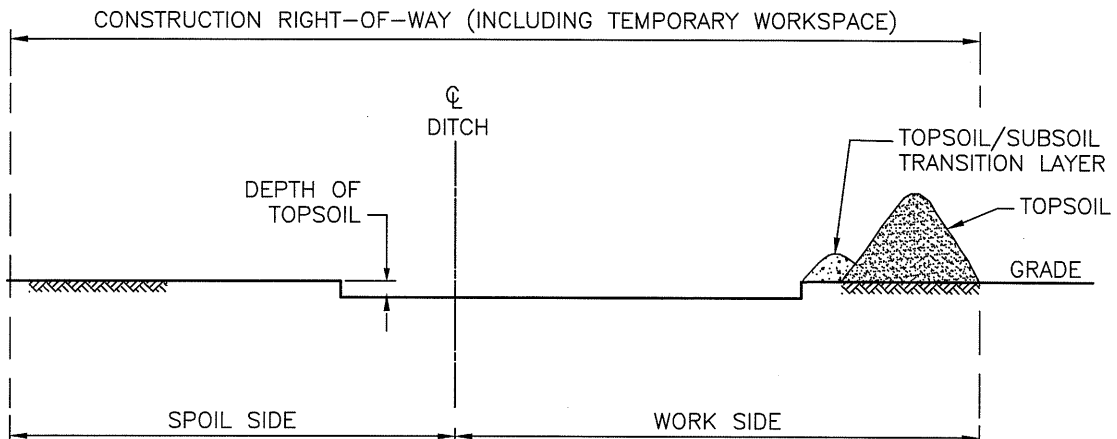
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REV

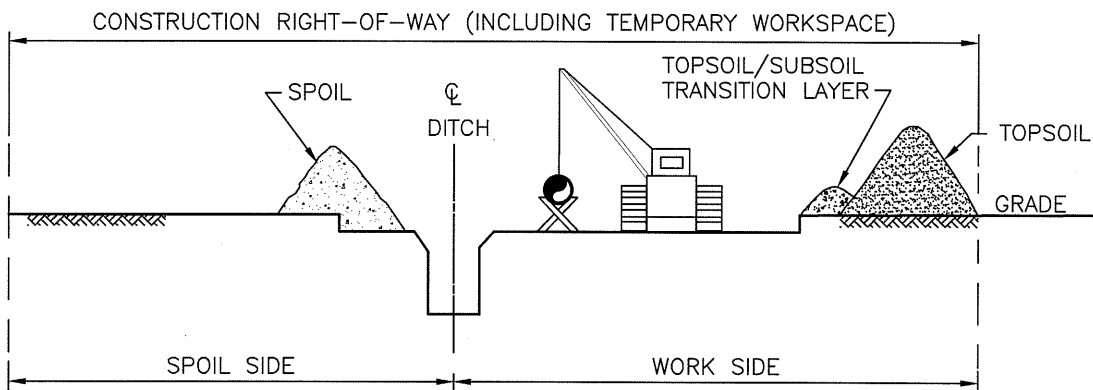
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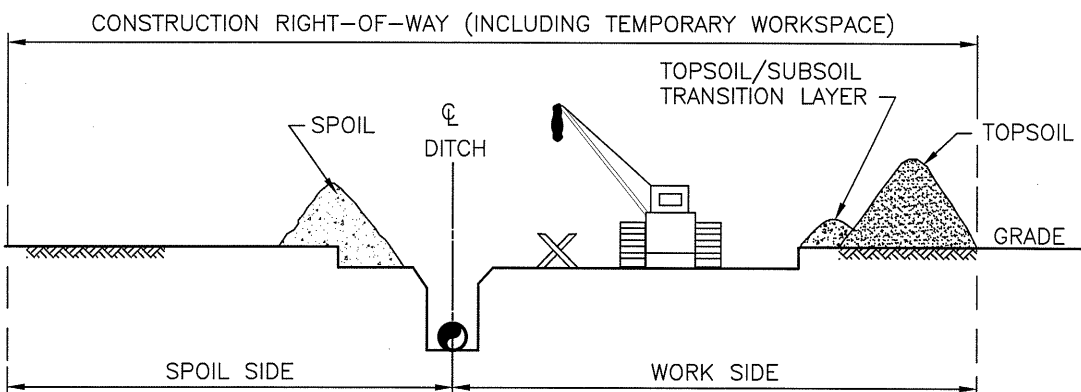
CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



1. STRIP TOPSOIL AND PILE IN APPROVED LOCATION, THEN REMOVE TOPSOIL/SUBSOIL TRANSITION LAYER FROM DITCHLINE AND WORK SIDE AREAS, AND PLACE BOTH IN WINDROW ON OUTSIDE EDGE OF RIGHT-OF-WAY, OR IN APPROVED IN TEMPORARY WORK SPACE. APPLY TOPSOIL STABILIZERS TO TOPSOIL PILE AS REQUIRED.



2. EXCAVATE TRENCH.



3. LOWER-IN PIPE.

STANDARD ISSUE 2015-06-03

REVISIONS 00



DESIGNER:

Douglas June 15, 2015
NAME DATE

CHECKED BY:

DESIGN CHECKER:

DESIGN STANDARD

FIA #

STDS

CHAINAGE:

DISCIPLINE #

03

TITLE

TOPSOIL CONSERVATION
DITCH AND WORKSIDE STRIPPING
(SHEET 1 OF 2)

SCALE N.T.S.

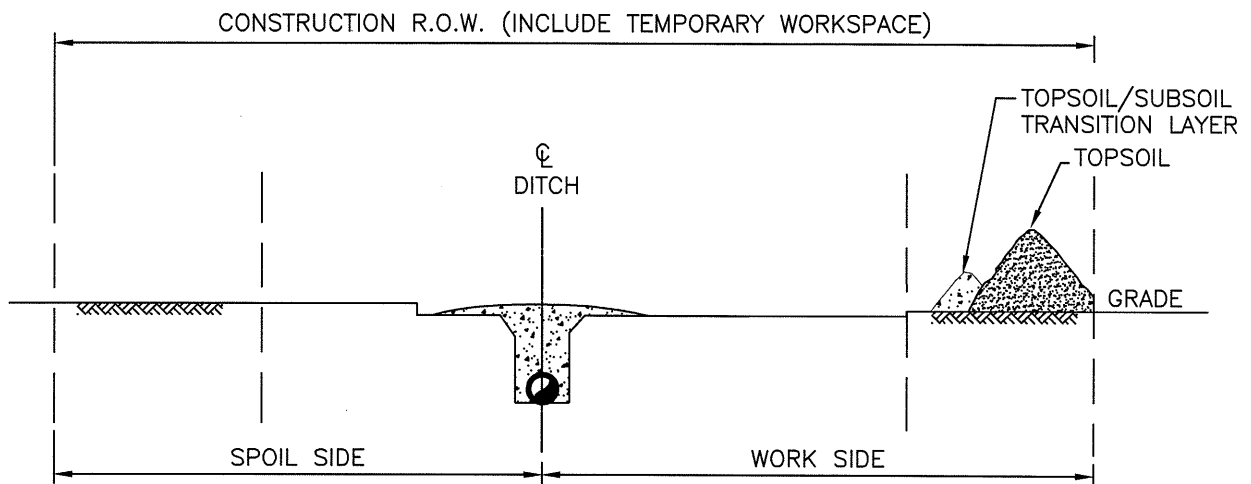
DWG No

STDS-03-ML-05-410

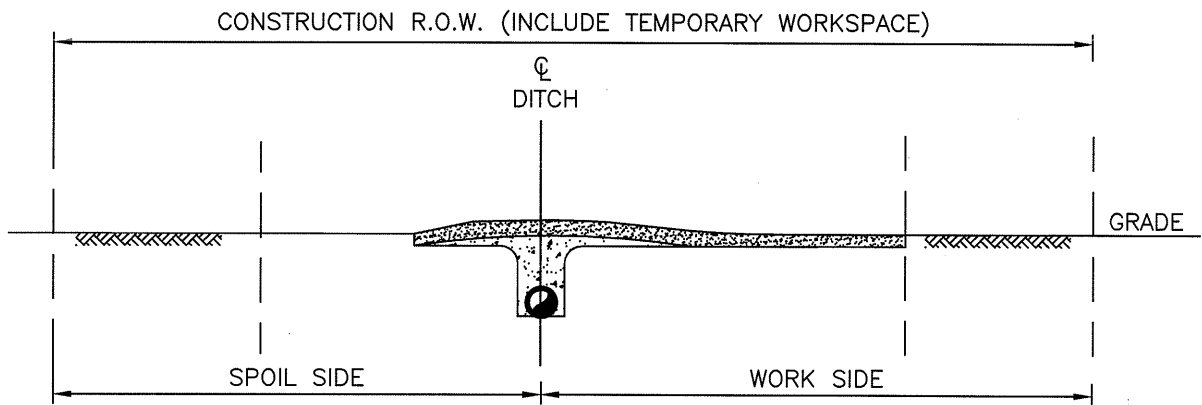
REV 00

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- BACKFILL AND COMPACT TRENCH PER APPROVED COMPACTION PROCEDURE. RELIEVE AREAS OF COMPACTION, AND FEATHER MATERIAL OVER STRIPPED AREA TO REDUCE HEIGHT OF ROACH TO A MAXIMUM 10cm. PREPARE SUB GRADE AS DIRECTED BY COMPANY.



- REPLACE TOPSOIL/SUBSOIL TRANSITION LAYER UNIFORMLY FIRST, FOLLOWED BY REPLACEMENT OF THE TOPSOIL PILE EVENLY OVER STRIPPED AREA. PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

NOTE:

REMOVE ALL ROCKS 10cm AND LARGER WITHIN THE UPPER 30cm OF SUBSOIL, AS WELL AS AFTER TOPSOIL REPLACEMENT.

TOPSOIL/SUBSOIL TRANSITION LAYER DEPTHS SHALL BE DETERMINED BY THE COMPANY AND SHALL NOT EXCEED 5cm DEPTH.

TOPSOIL SHALL BE STRIPPED IN A MANNER THAT MINIMIZES SUBSOIL INCORPORATION WITHIN THE MAIN TOPSOIL STOCKPILE.

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.

APPLICATION:

WHERE SPECIFIED BY THE COMPANY.

STANDARD ISSUE 2015-06-03

REVISIONS 00

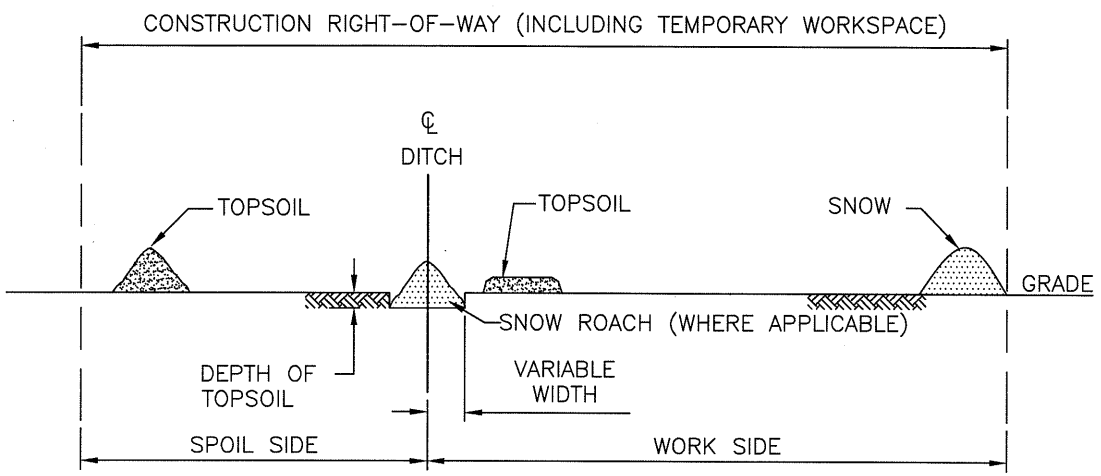


DESIGNER:
David R...
 NAME DATE
 June 15, 2015

CHECKED BY: *[Signature]*
 DESIGN CHECKER: *[Signature]*

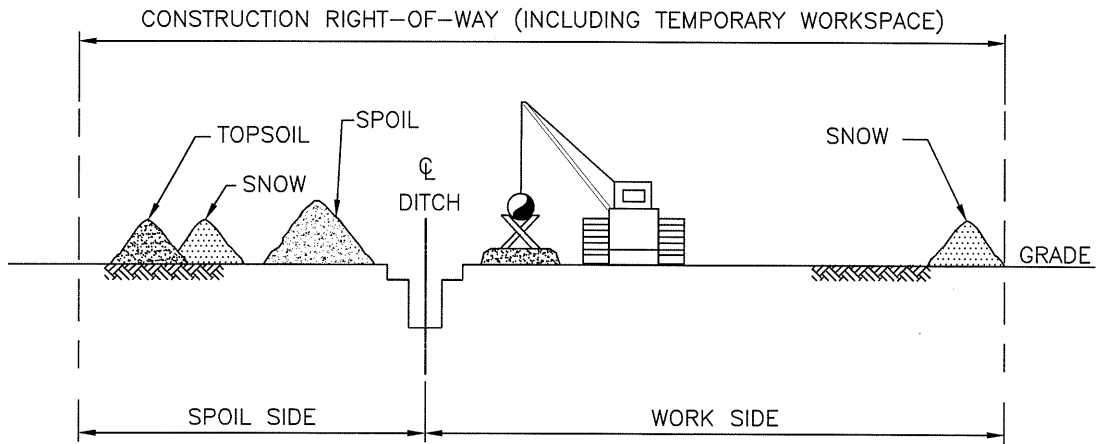
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FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE		TOPSOIL CONSERVATION DITCH AND WORKSIDE STRIPPING (SHEET 2 OF 2)	
SCALE N.T.S.	DWG No	STDS-03-ML-05-410	REV 00

01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC
 00 DRAWING SUPERSEDES SK-1411
 REVISIONS



1. STRIP TOPSOIL OVER DITCHLINE AND STOCKPILE ON WORKING SIDE, ADJACENT TO THE TRENCH. TOPSOIL CAN ALSO BE STOCK PILED ALONG THE RIGHT-OF-WAY BOUNDARY. APPLY TOPSOIL STABILIZERS TO TOPSOIL PILE AS REQUIRED.

NOTE: WIDTH STRIPPED OVER DITCHLINE MUST BE SUFFICIENT TO ACCOMMODATE DITCHER OR BACKHOE BUCKET AND CONSIDERATION FOR SOIL INSTABILITY.



2. SUBSOIL TO BE STOCKPILED ON SPOIL SIDE. PIPE MAY BE STRUNG ON TOPSOIL. WHERE APPLICABLE, USE AVAILABLE SNOW AS A BUFFER BETWEEN TRENCH SPOIL AND FROZEN SURFACE.



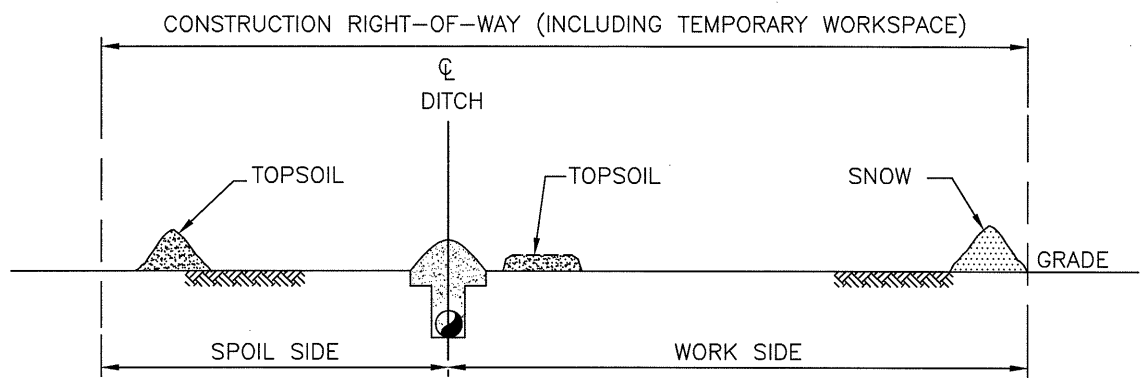
DESIGNER:
Douglas B... June 15, 2015
 NAME DATE
 CHECKED BY: *[Signature]* DESIGN CHECKER: *[Signature]*

DESIGN STANDARD		
FIA # STDS	CHAINAGE:	DISCIPLINE # 03
TITLE TOPSOIL CONSERVATION DITCHLINE (WINTER CONSTRUCTION) (SHEET 1 OF 2)		
SCALE N.T.S.	DWG No STDS-03-ML-05-411	REV 01

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01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC
 00 DRAWING SUPERSEDES SK-1411
 REVISIONS



BACKFILL AND MACHINE CLEAN-UP: (WINTER)

3. LOWER-IN PIPE, BACK FILL TRENCH, AND CENTER SPOIL OVER DITCHLINE TO FORM A ROACH.

FINAL CLEAN-UP (SUMMER)

4. REFER TO SECONDARY STRIPPING DRAWING STDS-03-ML-05-431 FOR SPOIL DISPLACEMENT. FOR FINAL CLEANUP PREPARATION, BACKFILL AND COMPACT TRENCH PER APPROVED PROCEDURE. REPLACE TOPSOIL AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

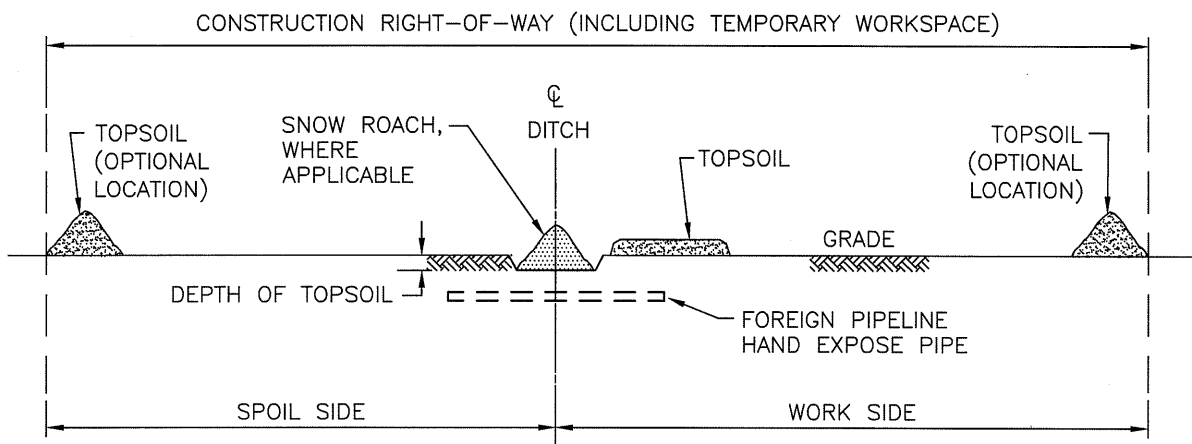
APPLICATION:

1. AGRICULTURAL LAND
2. WHERE NECESSARY BLADE SPOIL STORAGE AREA TO A SMOOTH SURFACE. TOPSOIL SHALL BE STORED IN PIPE LAY-UP AREA OR ALTERNATE LOCATION ALONG RIGHT-OF-WAY BOUNDARY WHERE DIRECTED BY THE COMPANY.

	DESIGNER:		DESIGN STANDARD		
	<i>Douglas B</i> <small>NAME</small>		FIA # STDS	CHAINAGE:	DISCIPLINE # 03
	June 15, 2015 <small>DATE</small>		TITLE		
	TOPSOIL CONSERVATION DITCHLINE (WINTER CONSTRUCTION) (SHEET 2 OF 2)		SCALE N.T.S.	DWG No STDS-03-ML-05-411	REV 01
CHECKED BY:		DESIGN CHECKER:			
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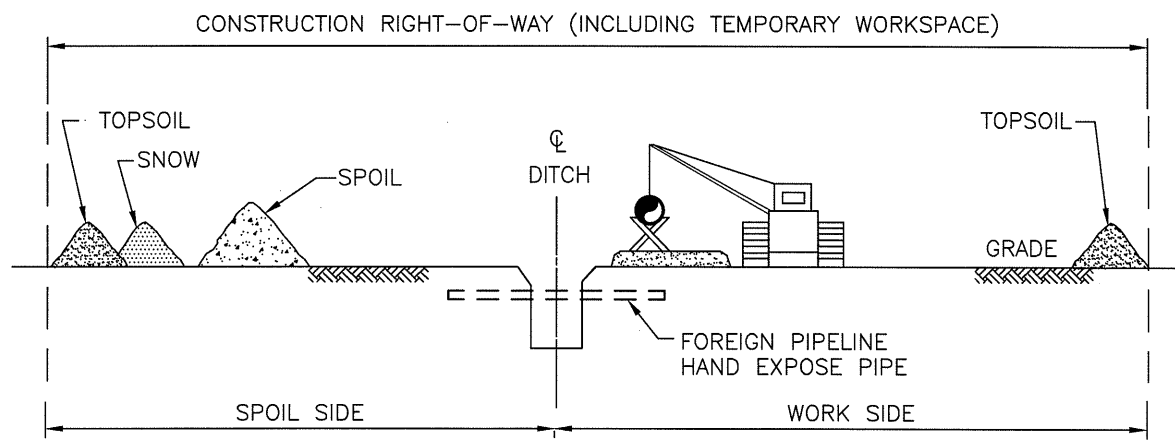
CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



1. STRIP TOPSOIL WIDER OVER DITCHLINE UP AND DOWNSTREAM OF THE FOREIGN LINE AND STOCKPILE ON WORKING SIDE OR RIGHT-OF-WAY BOUNDARY. APPLY TOPSOIL STABILIZERS TO TOPSOIL PILE, AS REQUIRED.

NOTES:

TOPSOIL MAY BE PLACED ON THE WORKING SIDE ADJACENT TO THE TRENCH, AND THE PIPE STRUNG ON IT, WHERE APPLICABLE. CROSSING AGREEMENTS MAY REQUIRE ALTERNATE VEHICLE CROSSING METHODS SUCH AS MATS, OR GEOTEXTILE AND SUBSOIL RAMPS. TOPSOIL SHALL THEN BE STOCKPILED ALONG EITHER BOUNDARY OF THE ROW.



2. SUBSOIL TO BE STOCKPILED ON SPOIL SIDE. CONFINE EXCAVATION TO STRIPPED AREA. WHERE APPLICABLE, USE AVAILABLE SNOW AS A BUFFER BETWEEN TRENCH SPOIL AND FROZEN SURFACE.

01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC
 00 STANDARD ISSUE, SUPERCEDES SK-1412
 REVISIONS

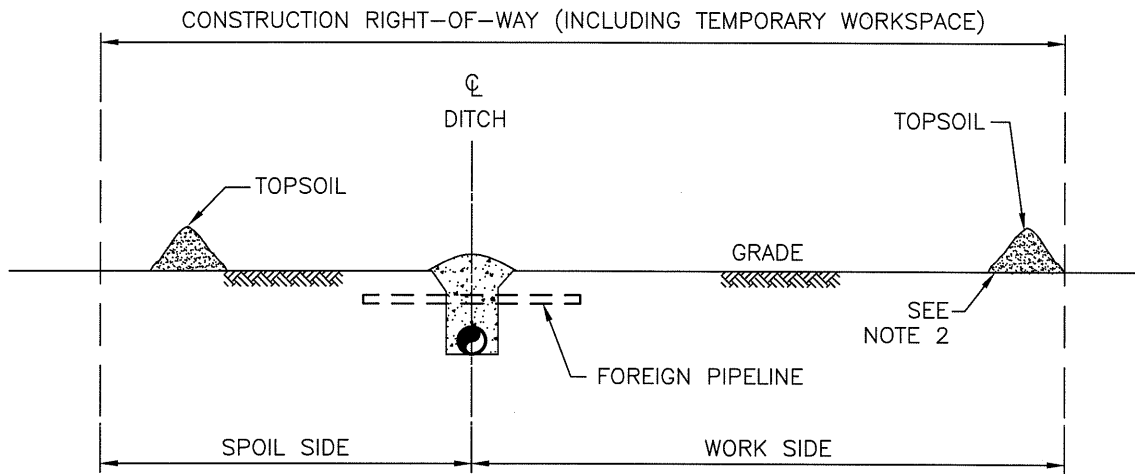
TIME
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	DESIGNER:	DESIGN STANDARD			
	<i>Douglas R...</i> NAME	FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
	June 15, 2015 DATE	TITLE			
		TOPSOIL CONSERVATION FOREIGN PIPELINE CROSSINGS (WINTER CONSTRUCTION) (SHEET 1 OF 2)			
	CHECKED BY:	DESIGN CHECKER:	SCALE N.T.S.	DWG No STDS-03-ML-05-412	REV 01

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CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

REVISIONS 00 STANDARD ISSUE, SUPERCEDES SK-1412 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



3. LOWER-IN PIPE AND BACKFILL. SCRAPE SUBSOIL INTO ROACH CENTRED OVER DITCHLINE.
4. REFER TO SECONDARY STRIPPING FOR SPOIL DISPLACEMENT DWG. STDS-03-ML-05-431 FINAL CLEANUP PREPARATION. BACKFILL AND COMPACT TRENCH PER APPROVED PROCEDURE. REPLACE TOPSOIL AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

APPLICATION:

1. AGRICULTURAL LAND.
2. WHERE NECESSARY, BLADE SPOIL STORAGE AREA TO A SMOOTH SURFACE. TOPSOIL SHALL BE STORED IN PIPE LAY-UP AREA OR ALTERNATE LOCATION ALONG ROW BOUNDARY WHERE DIRECTED BY THE COMPANY.
3. THE ADDITIONAL TOPSOIL STRIPPING WIDTH UPSTREAM AND DOWNSTREAM OF THE FOREIGN LINE CROSSING SHALL BE CONDUCTED PER STANDARD RIGHT-OF-WAY SPECIFICATION OR PER PROJECT REQUIREMENTS DETERMINED BY THE COMPANY.



DESIGNER: *Douglas* June 15, 2015
 NAME DATE
 CHECKED BY: *[Signature]* DESIGN CHECKER:

DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE TOPSOIL CONSERVATION FOREIGN PIPELINE CROSSINGS (WINTER CONSTRUCTION) (SHEET 2 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-412	REV 01

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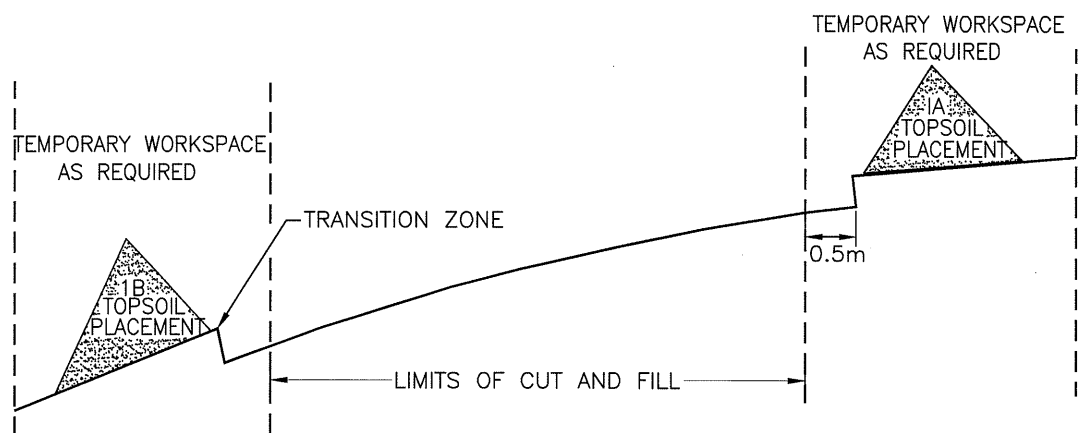
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GENERAL ISSUE -- REVIEWED FOR 2015 SPEC

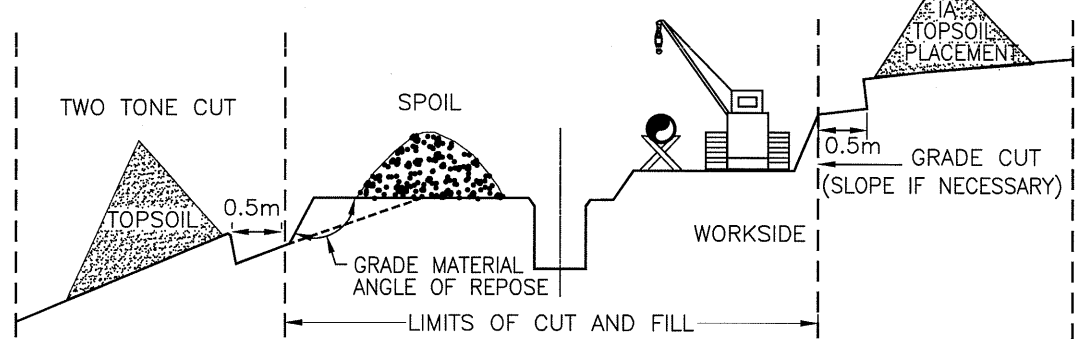
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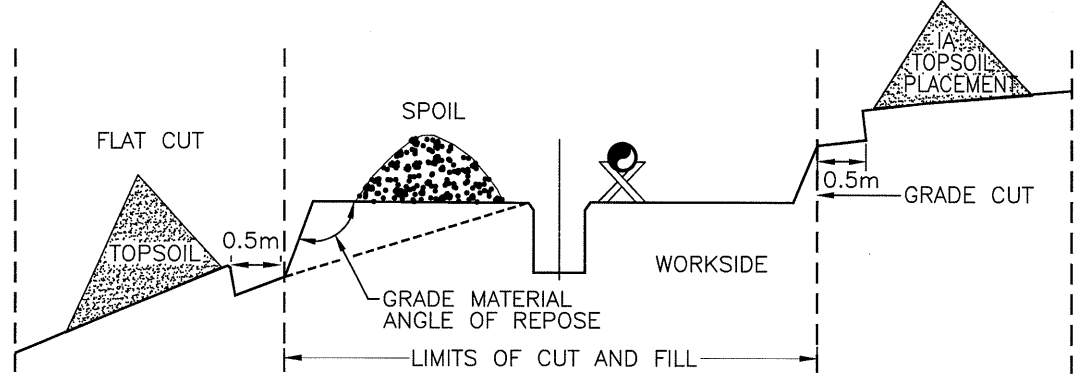
REVISIONS 00



1. WHENEVER POSSIBLE, STRIP TOPSOIL OVER THE FULL WIDTH OF THE RIGHT-OF-WAY PLUS EXTRA SPACE ON THE DOWNHILL AND UPHILL EDGE TO ALLOW FOR THE GRADE MATERIAL ANGLE OF REPOSE AND TOPSOIL GRADE CUT SEPARATION. PLACE TOPSOIL ON THE HIGH SIDE OF THE GRADE CUT IN TEMPORARY WORKSPACE WHERE POSSIBLE.



2. MAKE GRADE CUT (FLAT OR TWO TONE) STAYING 0.5m AWAY FROM TOPSOIL EDGE CUT OF PILE ON HIGH SIDE; AND BETWEEN GRADE MATERIAL AND TOPSOIL EDGE CUT OR PILE ON LOW SIDE. PLACE EXCESS GRADE SPOIL IN APPROVED PUSH OUTS ON ACQUIRED TEMPORARY WORK SPACE. PUSH OUTS MUST BE STRIPPED OF TOPSOIL TO THE SATISFACTION OF THE COMPANY. EXCAVATE DITCH AND MAINTAIN SEPARATION. ENSURE DEPTH OF COVER MINIMUMS ARE MET AND PIPE PLACEMENT IS WITHIN NATIVE SOIL PER THE COMPANY SPECIFICATION.



3. REPLACE GRADE CUT TO ORIGINAL CONTOUR, UNLESS APPROVED BY THE COMPANY. RELIEVE COMPACTION AND REPLACE TOPSOIL EVENLY OVER STRIPPED AREA. PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

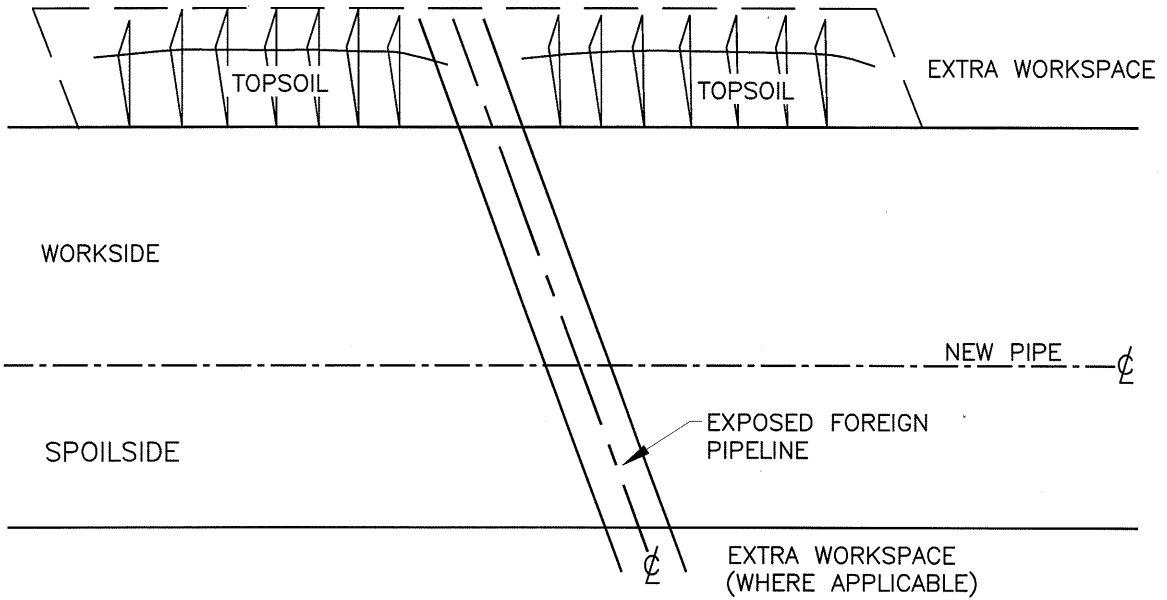


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[Signature] June 15, 2015
 NAME DATE
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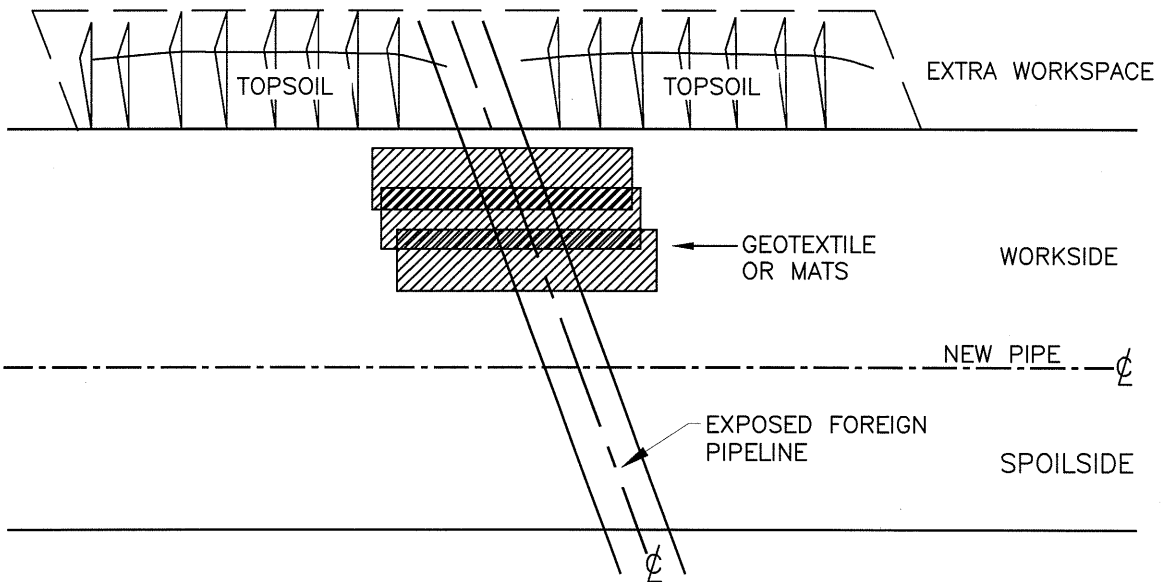
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TITLE TOPSOIL CONSERVATION FOR SIDE HILL GRADING IN AGRICULTURE LAND			
SCALE N.T.S.	DWG No	STDS-03-ML-05-421	REV 01

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CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



1. EXPOSE FOREIGN PIPELINE/FACILITY AS REQUIRED PER PROCEDURES AND AGREEMENTS. STRIP TOPSOIL AND TOPSOIL/SUBSOIL TRANSITION LAYER FULL WIDTH OF RIGHT-OF-WAY EITHER SIDE OF FOREIGN PIPELINE/FACILITY PER COMPANY STANDARD RIGHT-OF-WAY SPECIFICATION OR PROJECT PLANS. LEAVE UNSTRIPPED BUFFER EITHER SIDE OF THE FOREIGN PIPELINE/FACILITY INTACT, OR AS REQUIRED IN APPLICABLE AGREEMENTS.



2. LAY IMPERMEABLE GEOTEXTILE OR MATS ACROSS RIGHT-OF-WAY TO EXCEED WIDTH OF RAMP, AND OVERLAP ON WIDTH. LENGTH OF MATS MAY VARY, AND SHALL BE PLACED PER APPLICABLE AGREEMENTS.

00 REVISIONS
 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC
 DRAWING SUPERSEDES SK-1586 1 OF 2



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D. [Signature] June 15, 2015
 NAME DATE

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DESIGN STANDARD

FIA # STDS CHAINAGE: DISCIPLINE # 03

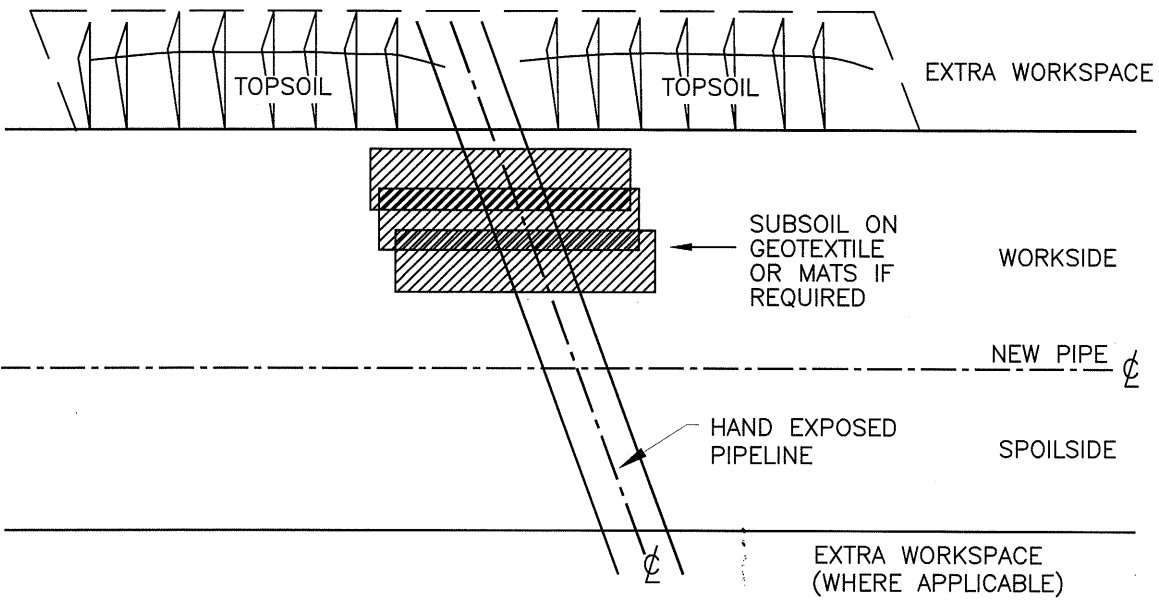
TITLE
 SOIL HANDLING FOR
 RAMPED LINE CROSSING
 (SHEET 1 OF 2)

SCALE N.T.S. DWG No STDS-03-ML-05-424 REV 01

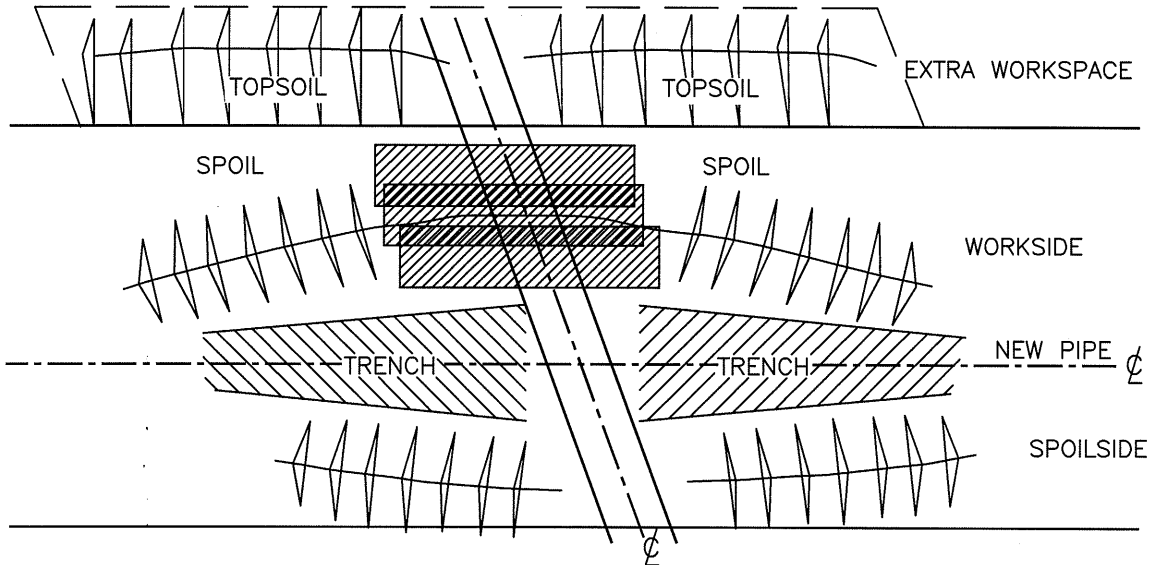
01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC

00 DRAWING SUPERSEDES SK-1586 2 OF 2

REVISIONS



- PLACE SUBSOIL FROM THE STRIPPED AREA OVER THE GEOTEXTILE OR MATS TO FORM A RAMP OVER THE FOREIGN PIPELINE.



- IF OPEN CUT, COVER REMAINING TOPSOIL OVER SPOIL AREA WITH GEOTEXTILE OR OTHER SUITABLE BARRIER, OR OTHER MEASURES TO ENSURE TOPSOIL IS NOT IN CONTACT WITH DITCH SPOIL. DITCH NORMALLY. IF BORED, TOPSOIL OVER SPOIL SIDE DOES NOT NEED TO BE COVERED. PLACE SPOIL FROM EXCAVATION AS REQUIRED ON BOTH SIDES OF TRENCH.
- INSTALL PIPE AND REPLACE SOILS IN CORRECT ORDER. COMPACT TRENCH PER APPROVED COMPACTION PROCEDURE. RELIEVE AREAS OF COMPACTION. REPLACE TOPSOIL AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

NOTE:

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.

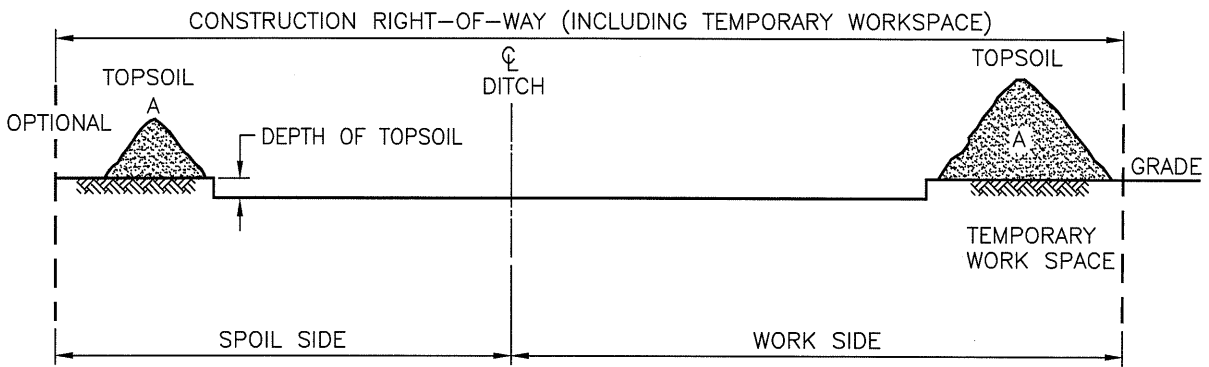


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[Signature] June 15, 2015
 NAME DATE
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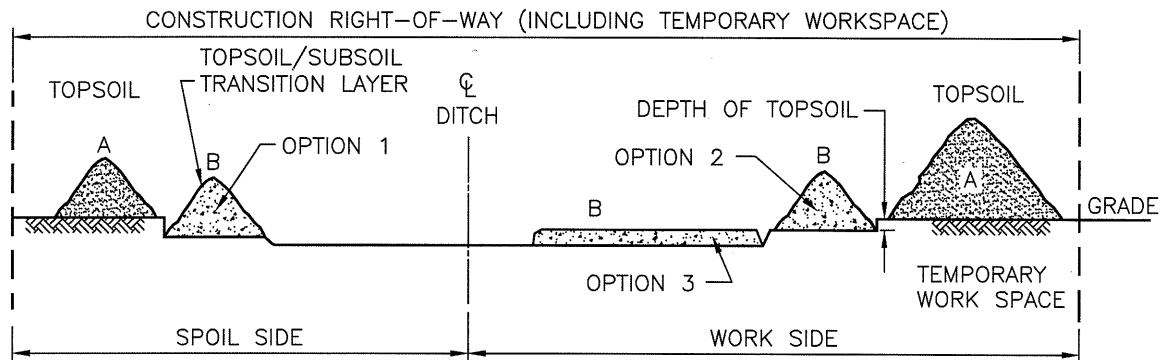
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FIA #	STDS	CHAINAGE:	
TITLE		SOIL HANDLING FOR RAMPED LINE CROSSING (SHEET 2 OF 2)	
SCALE N.T.S.	DWG No	STDS-03-ML-05-424	REV 01

TC_A4_EE.DWG 210X280

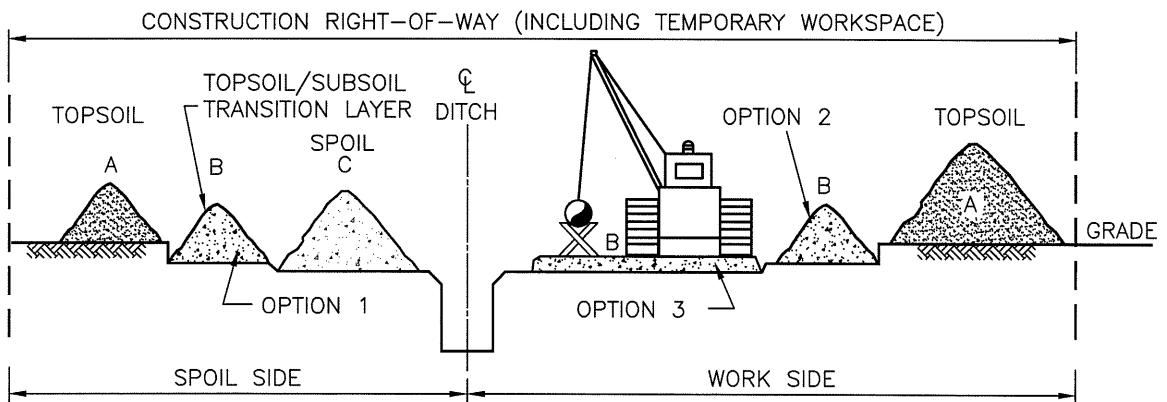
CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



1. STRIP TOPSOIL FROM SPOIL AND WORK SIDE AREAS. PLACE TOPSOIL IN WINDROWS ON OUTSIDE EDGE OF RIGHT-OF-WAY AND STORED IN TEMPORARY WORK SPACE. IN AREAS OF THICKER TOPSOILS, TOPSOIL MAY BE SPLIT TO BOTH SIDES OF THE RIGHT OF WAY WHERE APPROVED. APPLY TOPSOIL STABILIZERS TO TOPSOIL PILE, AS REQUIRED.



2. STRIP 'B' HORIZON FROM TRENCH AND SPOILSIDE AREAS OR FULL RIGHT-OF-WAY, AND PLACE ON STRIPPED AREA, EITHER AT SPOILSIDE OR WORKSIDE BOUNDARY OR TEMP W/S (IF APPROVED). (SEE OPTION 1 OR 2). IN OPTION 3, THE HORIZON (B) CAN BE FLATTENED AND DRIVEN ON WHERE APPROVED.



3. EXCAVATE TRENCH. THE TOE OF THE B AND C PILES CAN OVERLAP SLIGHTLY AND VISUAL DISTINCTION OF EACH PILE SHALL BE POSSIBLE AT ALL TIMES. STOCKPILING SHALL ALLOW FOR REPLACEMENT OF THE SOIL HORIZONS BACK TO THEIR ORIGINAL SEQUENCE.

STANDARD ISSUE 2015-06-03

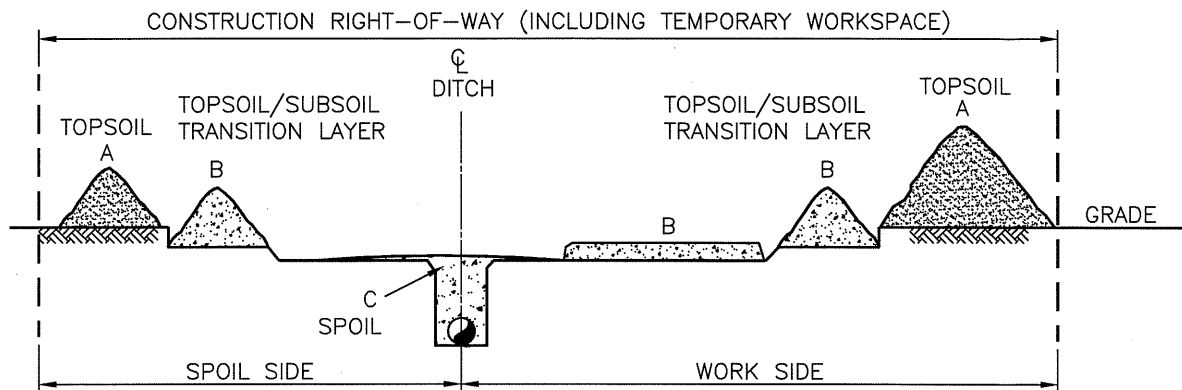
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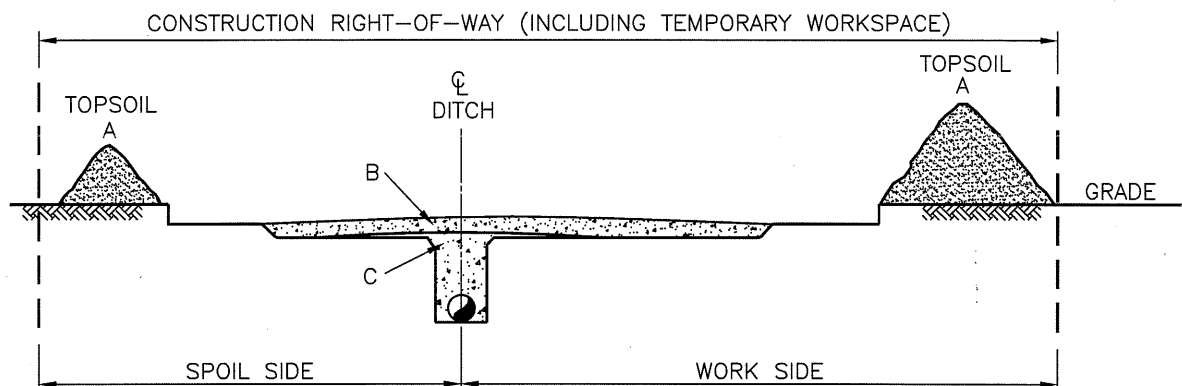
DESIGNER:
Douglas B... *June 15, 2015*
 NAME DATE

CHECKED BY: *[Signature]* DESIGN CHECKER: *[Signature]*

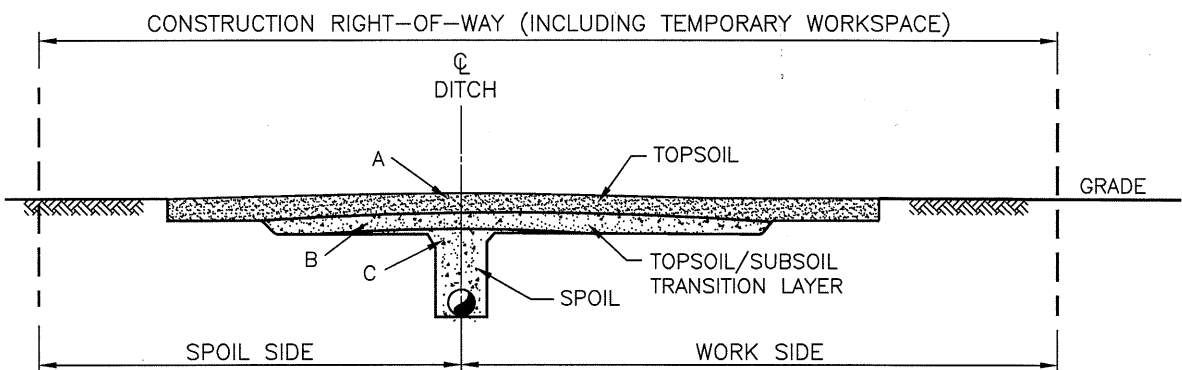
DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE TOPSOIL CONSERVATION FULL-WIDTH STRIPPING 3 LIFT (SHEET 1 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-426	REV 00



4. BACKFILL AND COMPACT TRENCH (C) PER APPROVED PROCEDURE.



5. RELIEVE AREAS OF COMPACTION ACROSS ROW, LEVEL AND SMOOTH SOIL MATERIAL AND FEATHER (B) MATERIAL EVENLY OVER STRIPPED AREA.



6. REPLACE TOPSOIL/SUBSOIL TRANSITION LAYER UNIFORMLY, FOLLOWED BY REPLACEMENT OF THE TOPSOIL PILE EVENLY OVER STRIPPED AREA, AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

NOTE:

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.

STANDARD ISSUE 2015-06-03

REVISIONS 00



DESIGNER: *[Signature]* June 15, 2015
 NAME: *[Signature]* DATE: 2015

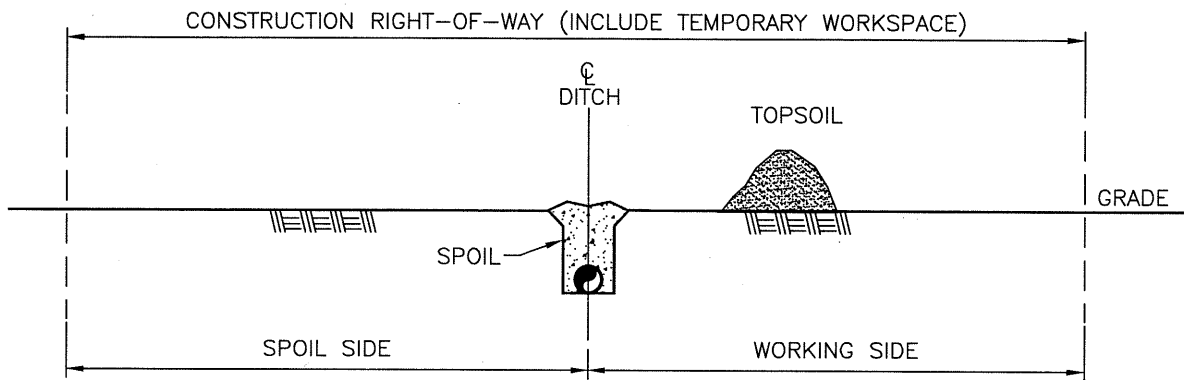
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DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE: TOPSOIL CONSERVATION FULL-WIDTH STRIPPING 3 LIFT (SHEET 2 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-426	REV 00

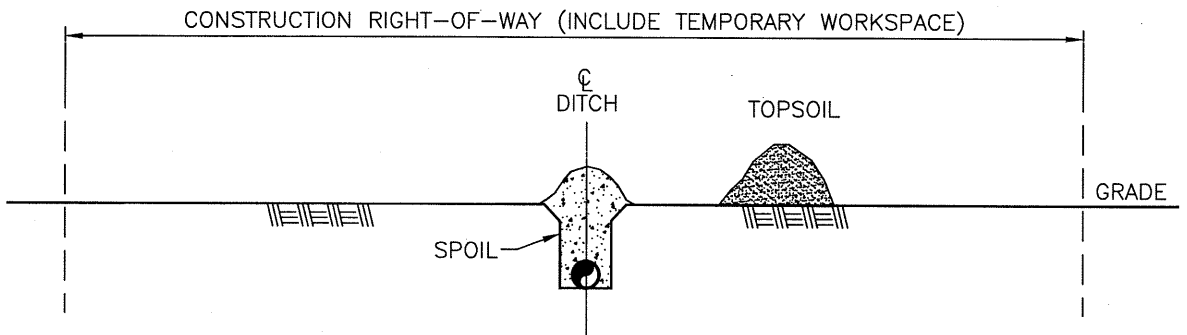
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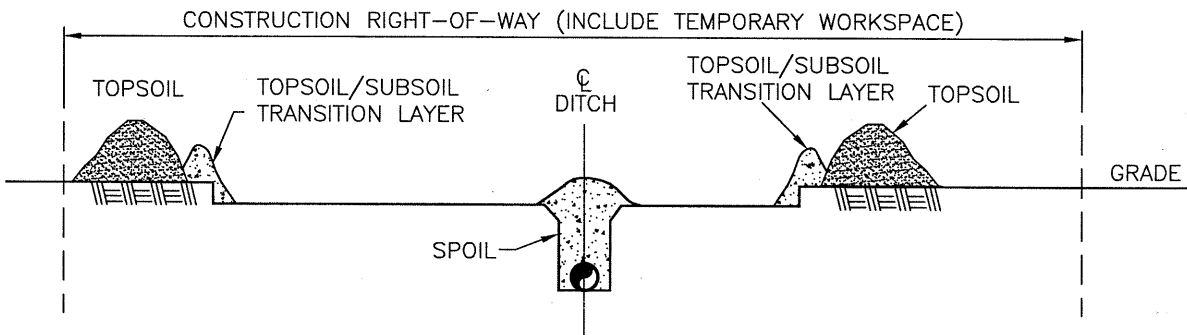
REVISIONS 00 STANDARD ISSUE, SUPERCEDES SK-1590 (1) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



1. SPRING CONFIGURATION FOLLOWING THAW OR OTHER SCENARIOS REQUIRING SECONDARY STRIPPING. TOPSOIL MAY ALSO BE STORED ALONG ROW BOUNDARIES.



2. BLADE SPOIL INTO PILE.



3. STRIP SPOIL AND WORK SIDE AREA WIDE ENOUGH TO ACCOMMODATE SPREADING AND DRYING OF SPOIL REMOVED FROM THE TRENCH AREA. UTILIZE A DISC TO FACILITATE DRYING OF TRENCH SPOIL.



DESIGNER:

June 16, 2015
[Signature]
 NAME DATE

DESIGN STANDARD

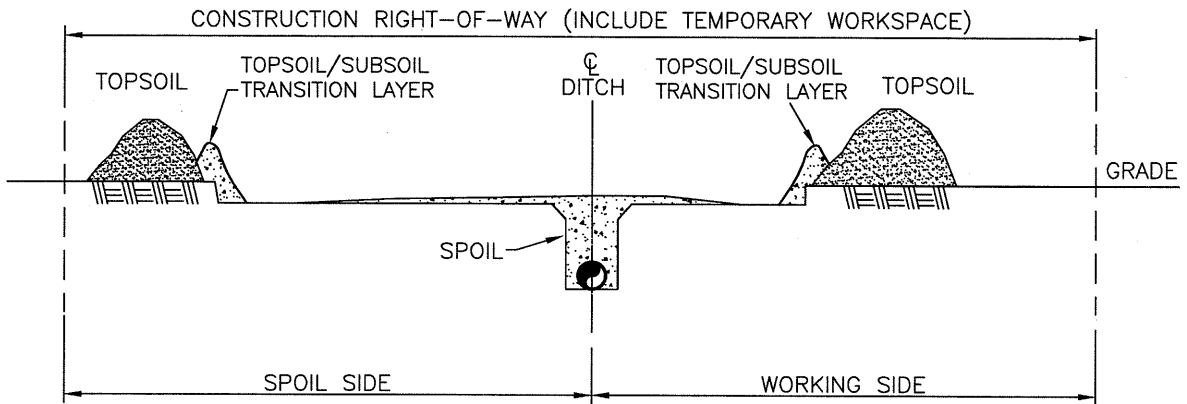
FIA # STDS CHAINAGE: DISCIPLINE # 03

TITLE
 SECONDARY STRIPPING FOR SPOIL
 DISPLACEMENT
 (SHEET 1 OF 2)

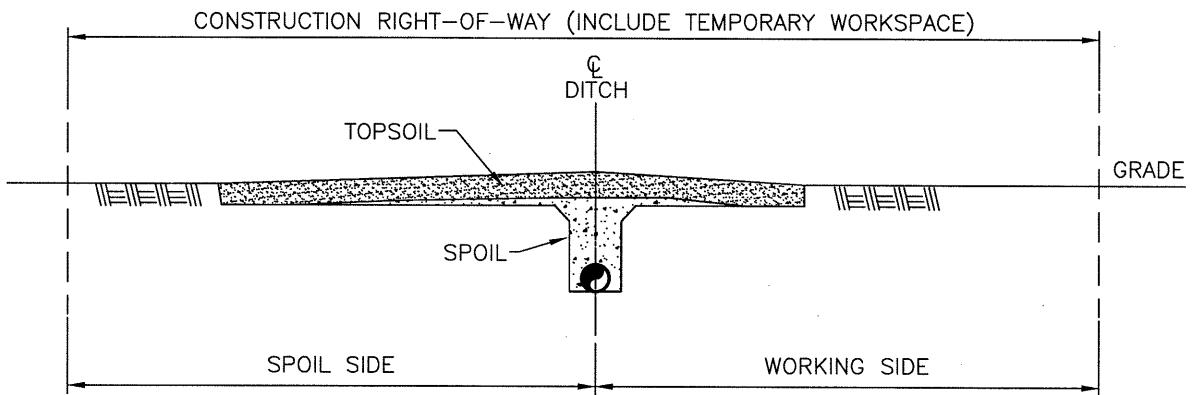
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[Signature] *[Signature]*

SCALE N.T.S. DWG No STDS-03-ML-05-431 REV 01



4. BACKFILL AND COMPACT TRENCH PER APPROVED PROCEDURE. RELIEVE AREAS OF COMPACTION.



5. REPLACE TOPSOIL/SUBSOIL TRANSITION LAYER UNIFORMLY FIRST, FOLLOWED BY REPLACEMENT OF THE TOPSOIL PILE EVENLY OVER THE STRIPPED AREA AND PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

APPLICATION:

SUMMER CLEANUP OF WINTER CONSTRUCTION OR OTHER AREAS AS DIRECTED BY THE COMPANY.

NOTE:

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.

REVISIONS 00 STANDARD ISSUE, SUPERCEDES SK-1590 (2) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



DESIGNER:
Douglas R. [Signature] June 16, 2015
NAME DATE

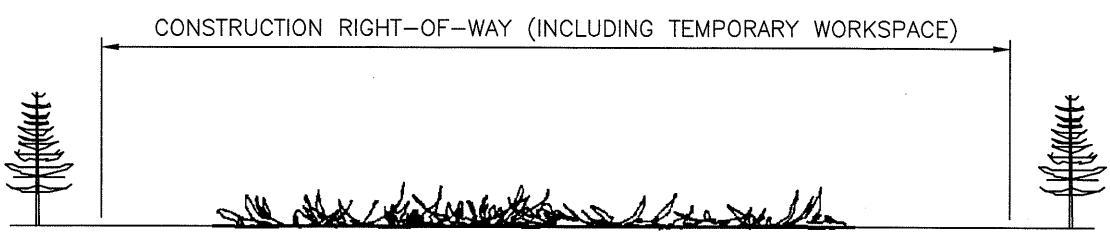
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TITLE SECONDARY STRIPPING FOR SPOIL DISPLACEMENT (SHEET 2 OF 2)			
SCALE N.T.S.	DWG No	STDS-03-ML-05-431	REV 01

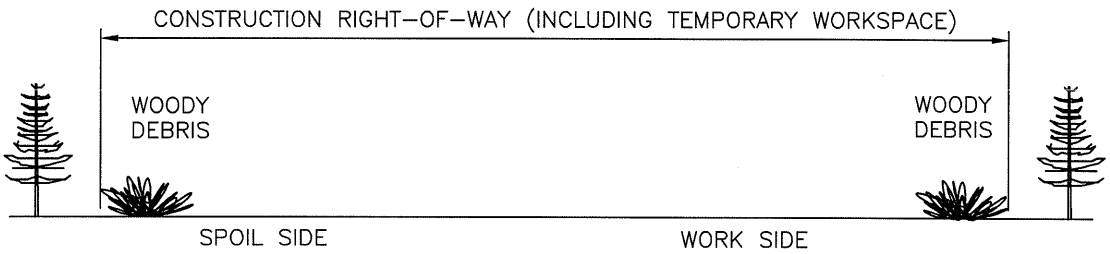
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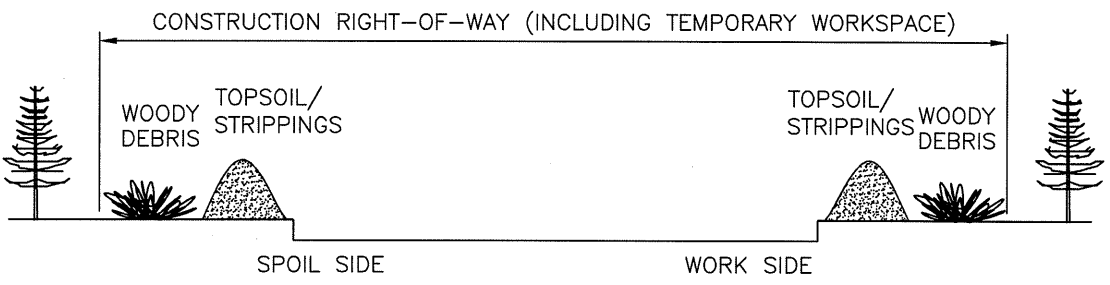
REVISIONS 00 DRAWING SUPERSEDES SK-1588 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



1. CLEAR MERCHANTABLE TIMBER FROM RIGHT-OF-WAY FOR DECKING AND HAULING TO END USER. WHERE APPROVED, PILE WOODY DEBRIS ALONG RIGHT-OF-WAY BOUNDARIES. CLEAR NON MERCHANTABLE WOODY MATERIAL FOR BURNING.



2. GRUB ENTIRE RIGHT-OF-WAY DISPOSING OF STUMPS AND ROOTS. PLACE WOODY DEBRIS IN APPROVED WORKSPACES. MINIMIZE ROOT DAMAGE WITHIN 2 METRES OF STANDING TREES. SPLIT TO BOTH SIDES WHERE REQUIRED.



3. SALVAGE TOPSOIL/STRIPPINGS FULL WIDTH OR OTHER AS APPROVED, TO DEPTHS SPECIFIED ON ALIGNMENT SHEETS. TOPSOIL MUST BE KEPT SEPARATE FROM WOODY DEBRIS. SPLIT TO BOTH SIDES WHERE REQUIRED. MINIMIZE ROOT DAMAGE WITHIN 2 METRES OF STANDING TREES.

* APPLIES TO FREEHOLD (PRIVATE), AND DESIGNATED CROWN AGRICULTURAL LANDS.

	DESIGNER:		DESIGN STANDARD			
	<i>Douglas B...</i> NAME DATE		FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
CHECKED BY: <i>[Signature]</i> DESIGN CHECKER: <i>[Signature]</i>		TITLE GRUBBING AND TOPSOIL CONSERVATION FOR TREETED LAND (SHEET 1 OF 2)				
		SCALE N.T.S.	DWG No STDS-03-ML-05-443		REV 01	

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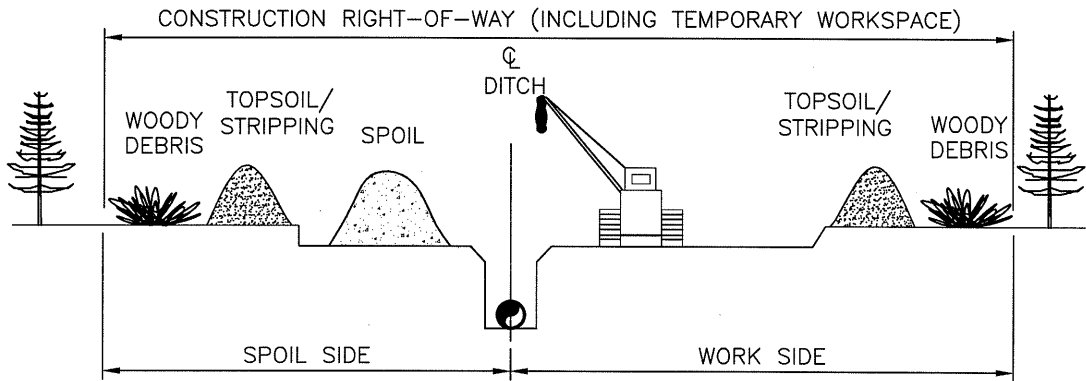
GENERAL ISSUE - REVIEWED FOR 2015 SPEC

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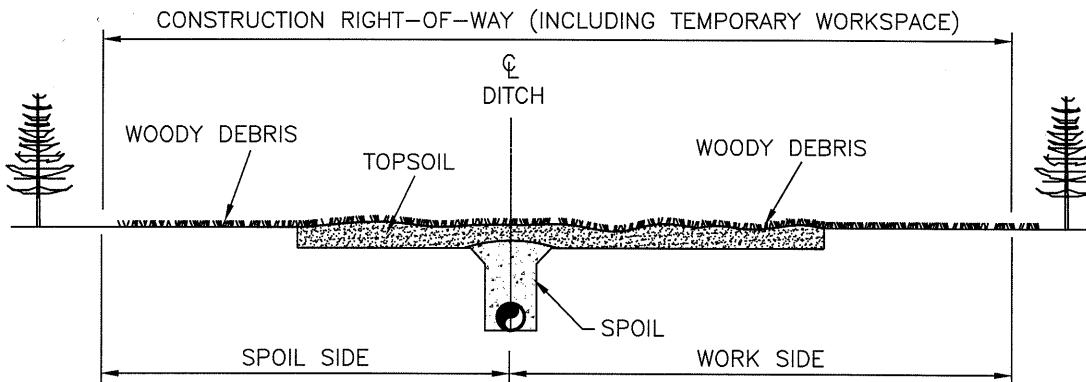
DRAWING SUPERSEDES SK-1588

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REVISIONS



4. EXCAVATE DITCH, LOWER-IN AND BACKFILL



5. BACKFILL AND COMPACT TRENCH AS PER APPROVED PROCEDURE AND REPLACE TOPSOIL/STRIPPINGS UNIFORMLY ACROSS STRIPPED AREA. REMOVE ROOTS AS REQUESTED BY LANDOWNER, AND ENSURE CONSISTENCY WITH EXISTING OR ADJACENT LAND USE. PREPARE SURFACE FOR RECLAMATION AS DIRECTED BY THE COMPANY.

* APPLIES TO FREEHOLD (PRIVATE), AND DESIGNATED CROWN AGRICULTURAL LANDS.

NOTE:

FOLLOWING TRENCH COMPACTION, FEATHER THE REMAINING SPOIL DISPLACED BY THE PIPE OVER THE APPLICABLE STRIPPED AREA TO ENSURE FINAL CROWN HEIGHT OVER THE TRENCH DOES NOT EXCEED 10cm.

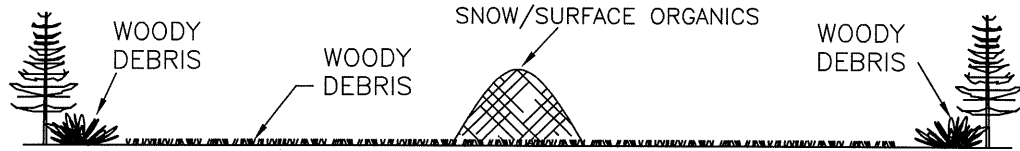
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	 NAME DATE: <i>June 15, 2015</i>	FIA #	STDS	CHAINAGE:
	CHECKED BY:	TITLE		
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		SCALE N.T.S.	DWG No STDS-03-ML-05-443	REV 01

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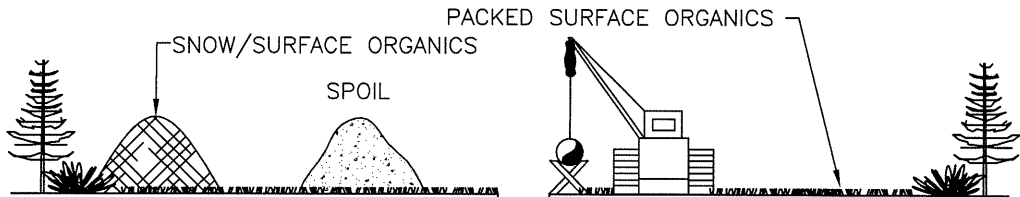
CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



1. CLEAR MERCHANTABLE TIMBER FROM RIGHT-OF-WAY FOR DECKING AND HAULING TO END USER. WHERE APPROVED, PILE WOODY DEBRIS ALONG RIGHT-OF-WAY BOUNDARIES AND CLEAR NON MERCHANTABLE WOODY MATERIAL FOR BURNING DURING CLEANUP.



2. USE SUITABLE EQUIPMENT (e.g. MULCHER) TO MULCH NON MERCHANTABLE TIMBER STUMPS AND ROOTS LEVEL WITH THE SURFACE TO MINIMIZE GROUND DISTURBANCE. THE DEPTH OF WOODY DEBRIS FOLLOWING MULCHING SHALL NOT EXCEED 5cm.
3. LEVEL THE REMAINING SURFACE MATERIAL TO CREATE A WORKING SURFACE. SNOW/SURFACE ORGANIC MATERIAL MIXTURE MAY BE USED TO CONSTRUCT A SNOW ROACH OVER THE PROPOSED DITCH TO PREVENT FREEZING OF THE DITCHLINE.
4. WHERE GRADING IS REQUIRED, STRIP SURFACE ORGANIC MATERIAL AND STORE IN TEMPORARY WORKSPACE OR OTHER APPROVED LOCATIONS FOR REPLACEMENT



5. EXCAVATE DITCH AND LOWER-IN
6. BACKFILL AND ROACH THE DITCHLINE WITH DITCH MATERIAL.
7. REPLACE SNOW/SURFACE ORGANICS EVENLY OVER THE AREAS WHERE IT WAS REMOVED DURING RIGHT-OF-WAY PREPARATION. REPLACE WOODY DEBRIS ACROSS THE RIGHT-OF-WAY, WHERE APPROVED.

NOTE: APPLIES TO CROWN, AND/OR NON-AGRICULTURAL DESIGNATED AREAS. UNLESS GRADING IS REQUIRED, STRIPPING OF SURFACE MATERIALS SHOULD NOT BE CONDUCTED WHEN USING THE MINIMAL SURFACE DISTURBANCE PROCEDURE.

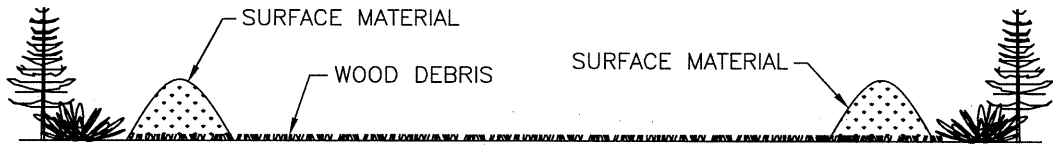
STANDARD ISSUE 2015-06-03
REVISIONS 00

TIME DESIGNFILE

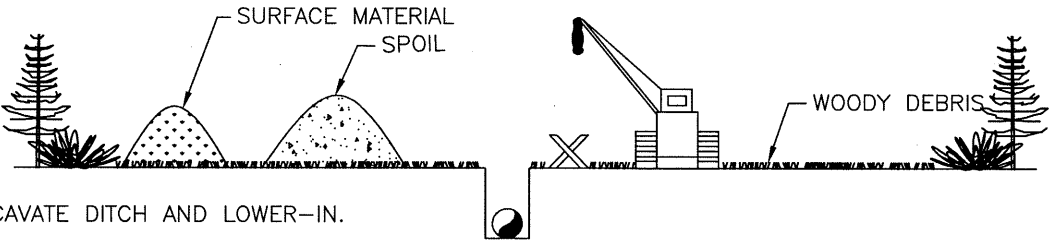
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	<i>D. [Signature]</i> NAME DATE June 15, 2015	FIA #	STDS	CHAINAGE:
	CHECKED BY:	DESIGN CHECKER:	TITLE	
	<i>[Signature]</i>	<i>[Signature]</i>	FROZEN FORESTED LANDS RIGHT-OF-WAY PREPARATION (MINIMAL SURFACE DISTURBANCE)	
			SCALE N.T.S.	DWG No STDS-03-ML-05-445 REV 00



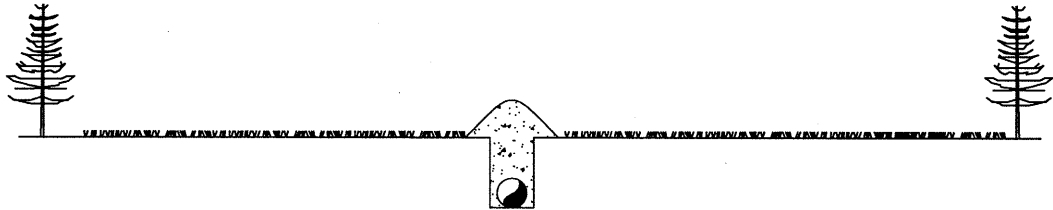
1. CLEAR MERCHANTABLE TIMBER FROM RIGHT-OF-WAY FOR DECKING AND HAULING TO END USER. WHERE APPROVED, PILE WOODY DEBRIS ALONG RIGHT-OF-WAY BOUNDARIES. CLEAR NON MERCHANTABLE WOODY MATERIAL FOR BURNING DURING CLEANUP.



2. USE SUITABLE EQUIPMENT (e.g. HOE WITH THUMB) TO REMOVE STUMPS AND ROOTS
3. SALVAGE STRIPPINGS AND STORE IN TEMPORARY WORKSPACE OR OTHER APPROVED LOCATIONS FOR REPLACEMENT DURING CLEANUP.



4. EXCAVATE DITCH AND LOWER-IN.



5. BACKFILL AND ROACH THE DITCHLINE WITH DITCH MATERIAL.
6. REPLACE STRIPPINGS EVENLY OVER THE AREAS WHERE IT WAS REMOVED DURING RIGHT-OF-WAY PREPARATION. REPLACE WOODY DEBRIS ACROSS THE RIGHT-OF-WAY, WHERE APPROVED.

NOTE:

APPLIES TO CROWN, AND/OR NON-AGRICULTURAL DESIGNATED AREAS.

REVISIONS 00 STANDARD ISSUE 2015-06-03



DESIGNER:

David B...
NAME DATE
June 16, 2015

CHECKED BY:

DESIGN CHECKER:

DESIGN STANDARD

FIA #

STDS

CHAINAGE:

DISCIPLINE #

03

TITLE

NON-FROZEN FORESTED LANDS
SURFACE MATERIALS/STRIPPING CONSERVATION

SCALE

N.T.S.

DWG No

STDS-03-ML-05-446

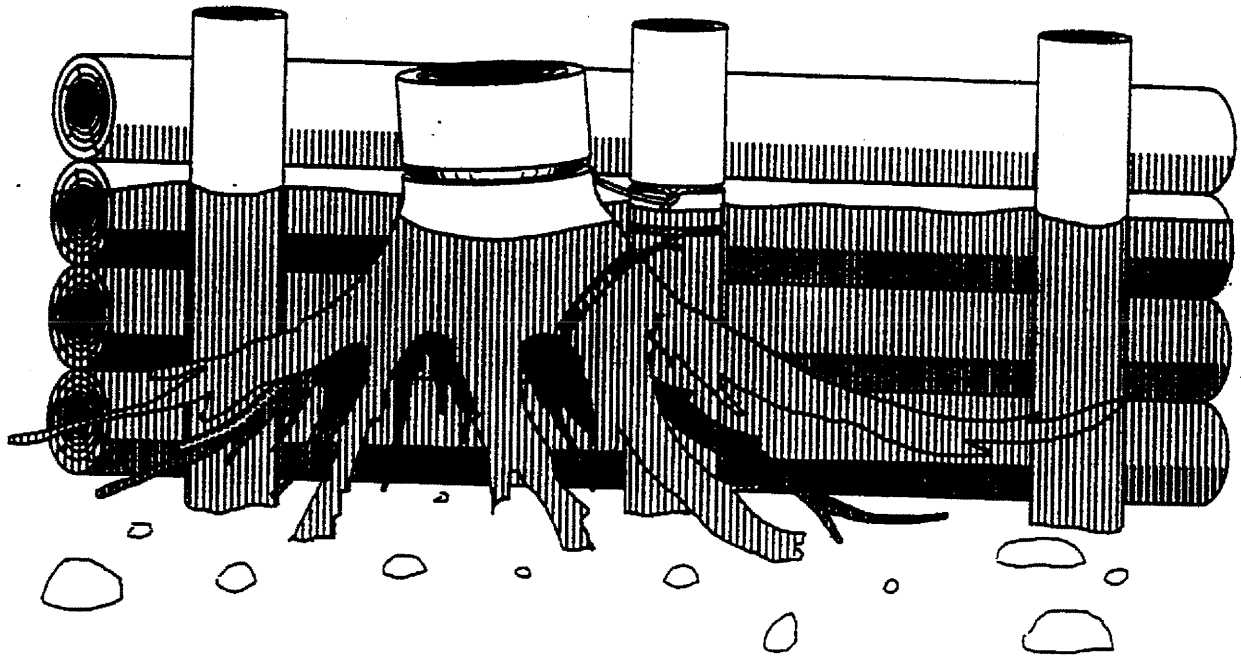
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01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC

00 SUPERSEDES RB001.PPL 2002/04/24

REVISIONS



NOTE:

ROOTWAD PLACEMENT SHOWN FOR ILLUSTRATION PURPOSES ONLY. ROOTWADS CAN BE INCORPORATED AS PART OF VARIOUS BANK PROTECTION AND/OR HABITAT ENHANCEMENT MEASURES TO SUIT PROJECT REQUIREMENTS, AND WHERE APPROVED BY THE COMPANY.



DESIGNER:

Dawson King June 3, 2015
NAME DATE

CHECKED BY:

DESIGN CHECKER:

[Signature] *MS*

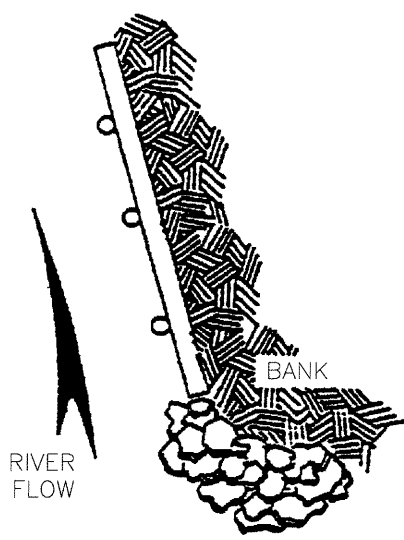
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FIA #	STDS	CHAINAGE:	D/SCIPLINE # 03
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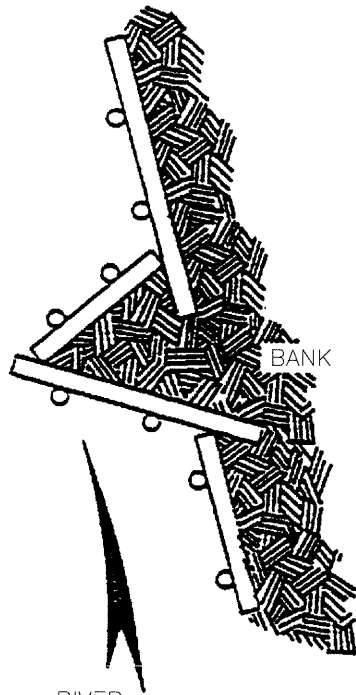
TITLE
 STREAMBANK RECLAMATION - ROOTWAD

SCALE N.T.S.	DWG No STDS-03-ML-05-601	REV 01
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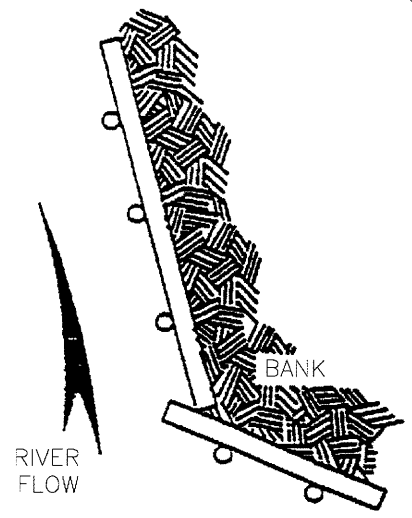
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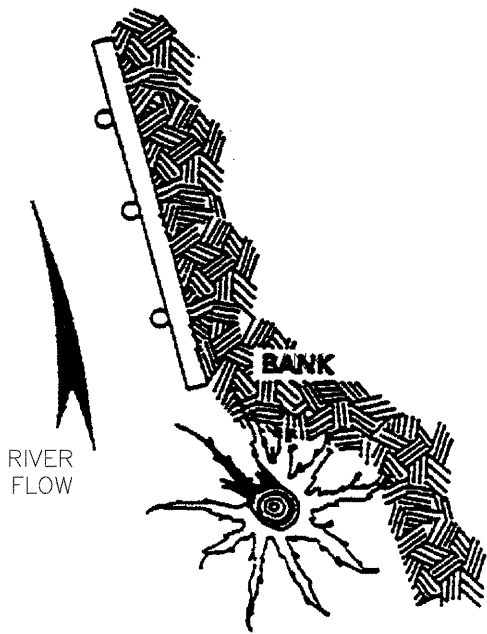
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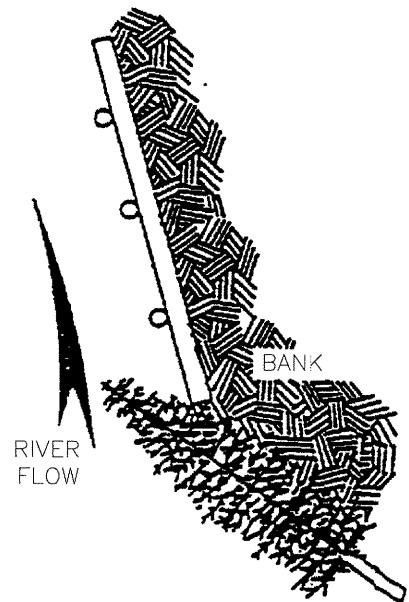
WING
DEFLECTOR
DESCRIPTION



LOGWALL
DESCRIPTION



ROOTWAD
DESCRIPTION



TREE REVETMENT
DESCRIPTION

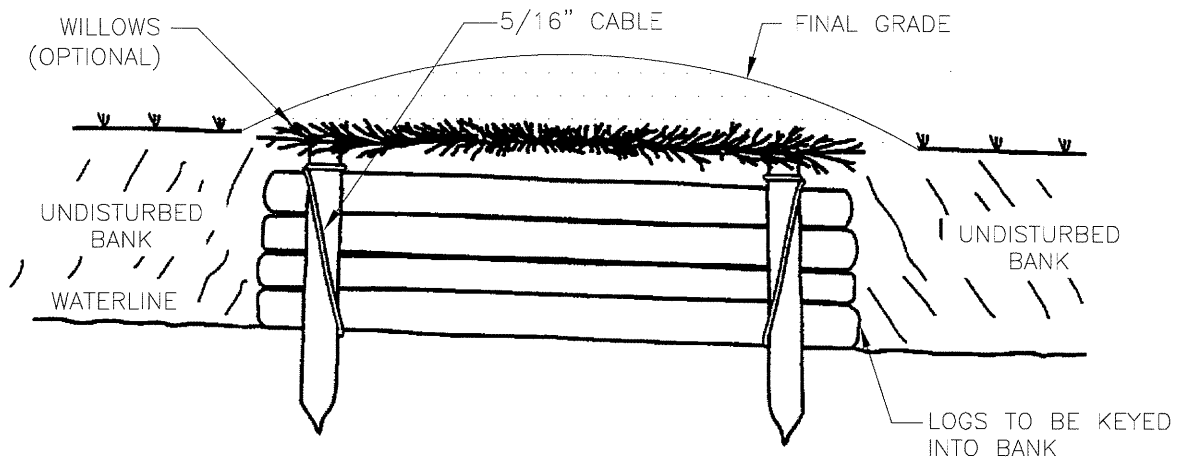
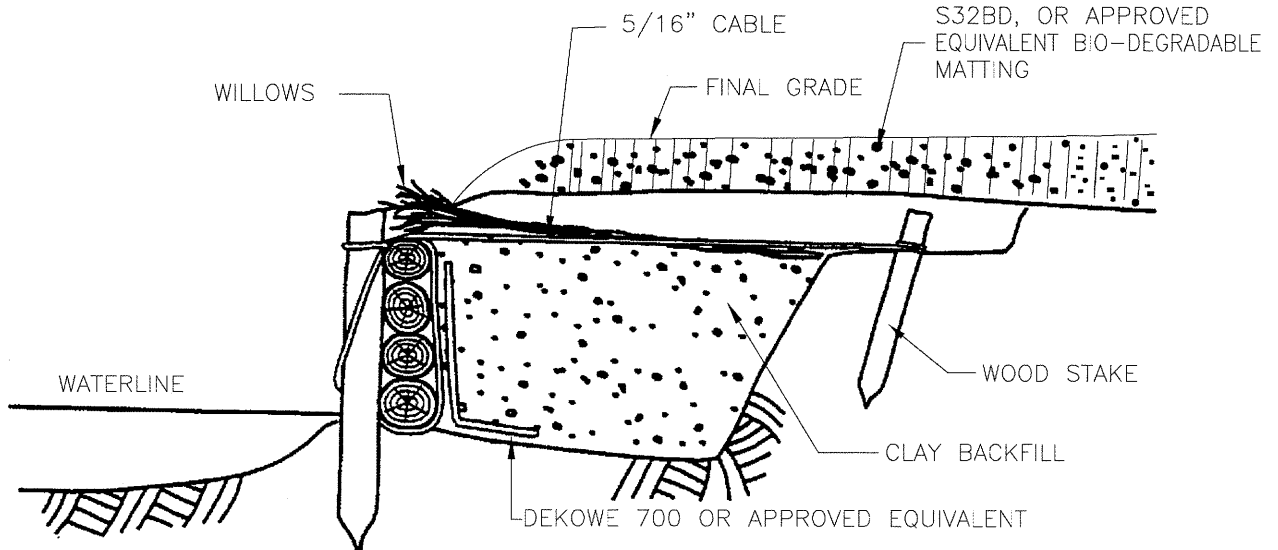
REVISIONS 00 SUPERSEDES RB0002.PPL 2002/04/24 01 GENERAL ISSUE -- REVIEWED FOR 2015 SPEC



DESIGNER:
Douglas By June 3, 2015
NAME DATE

CHECKED BY: *[Signature]* DESIGN CHECKER: *[Signature]*

FIA #	CHAINAGE:	D.SCIPLINE #
TITLE STREAMBANK RECLAMATION – DEFLECTORS		
SCALE N.T.S.	DWG No STDS-03-ML-05-602	REV 01



NOTES:

1. LOG WALLS TO BE CONSTRUCTED USING CONIFEROUS MATERIAL.
2. UNFROZEN BACKFILL OR LOOSE GRADE MATERIAL SHOULD BE USED AS FILL MATERIAL.
3. ANCHOR PILINGS OR DEADMAN ANCHORS TO BE USED TO SECURE CABLE IN BANK.
4. REFER TO STDS-03-ML-05-606 FOR DETAIL ON WILLOWS INSTALLATION.

01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC
 00 SUPERSEDES RB0003.PPL 2002/04/24
 REVISIONS ID



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[Signature] June 3, 2015
 NAME DATE
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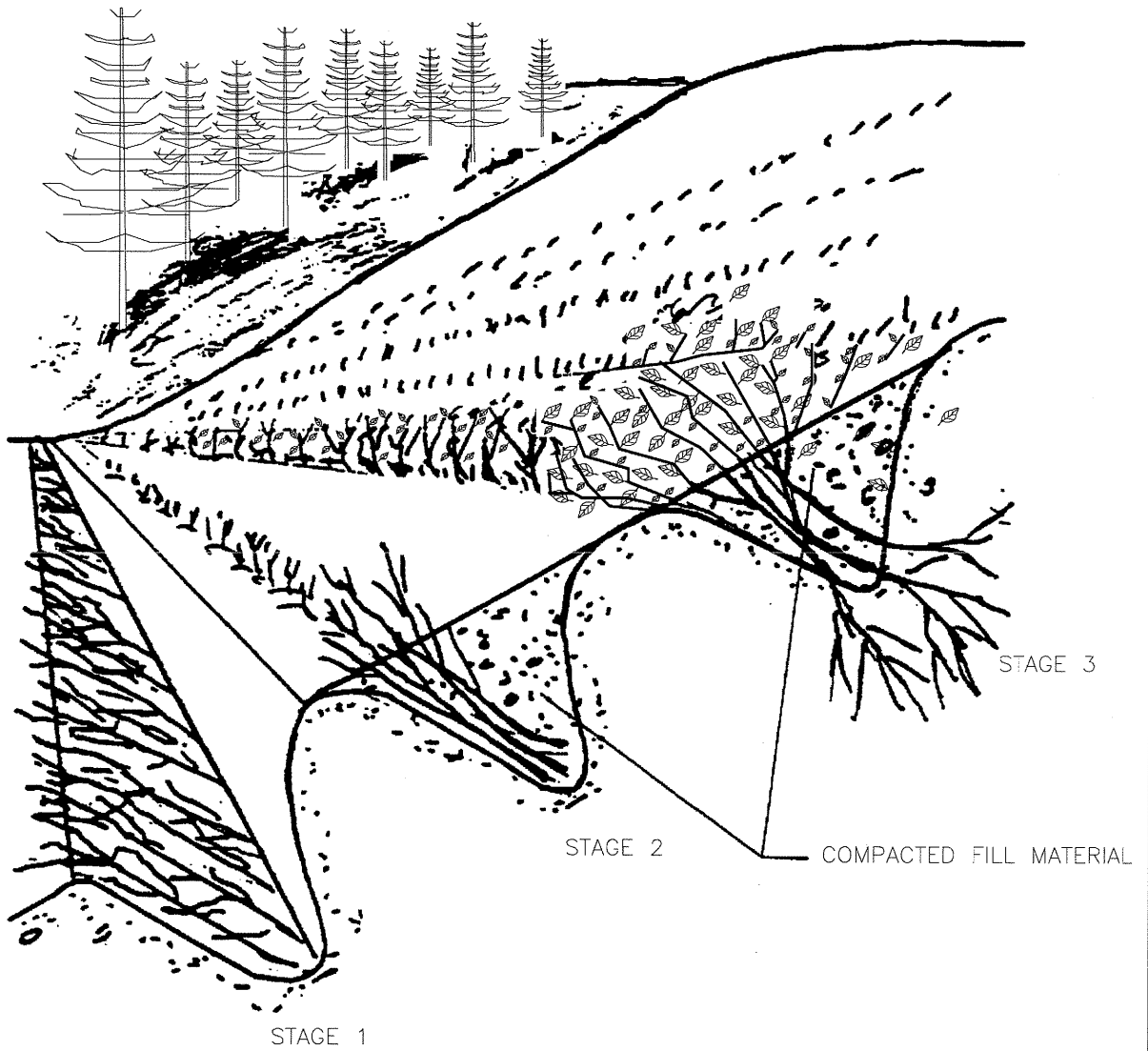
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FIA #	STDS	CHAINAGE:	
TITLE		STREAMBANK RECLAMATION LOG WALL	
SCALE N.T.S.	DWG No	STDS-03-ML-05-603	REV 01

TIME DESIGNFILE

01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC

00 SUPERSEDES RB0004.PPL 2002/04/24

REVISIONS



- STAGE 1. CUT TRENCH ACROSS SLOPE. FILL WITH DORMANT WOODY PLANT MATERIAL.
 - STAGE 2. FILL IS PLACED ON TOP OF BRANCH AND COMPACTED LAYER.
 - STAGE 3. POTENTIAL GROWTH AFTER 2 - 3 GROWING SEASONS.
- REFER TO STDS-03-ML-05-606 FOR DETAIL ON WILLOWS INSTALLATION.



DESIGNER:

Douglas By June 3, 2015
NAME DATE

CHECKED BY:

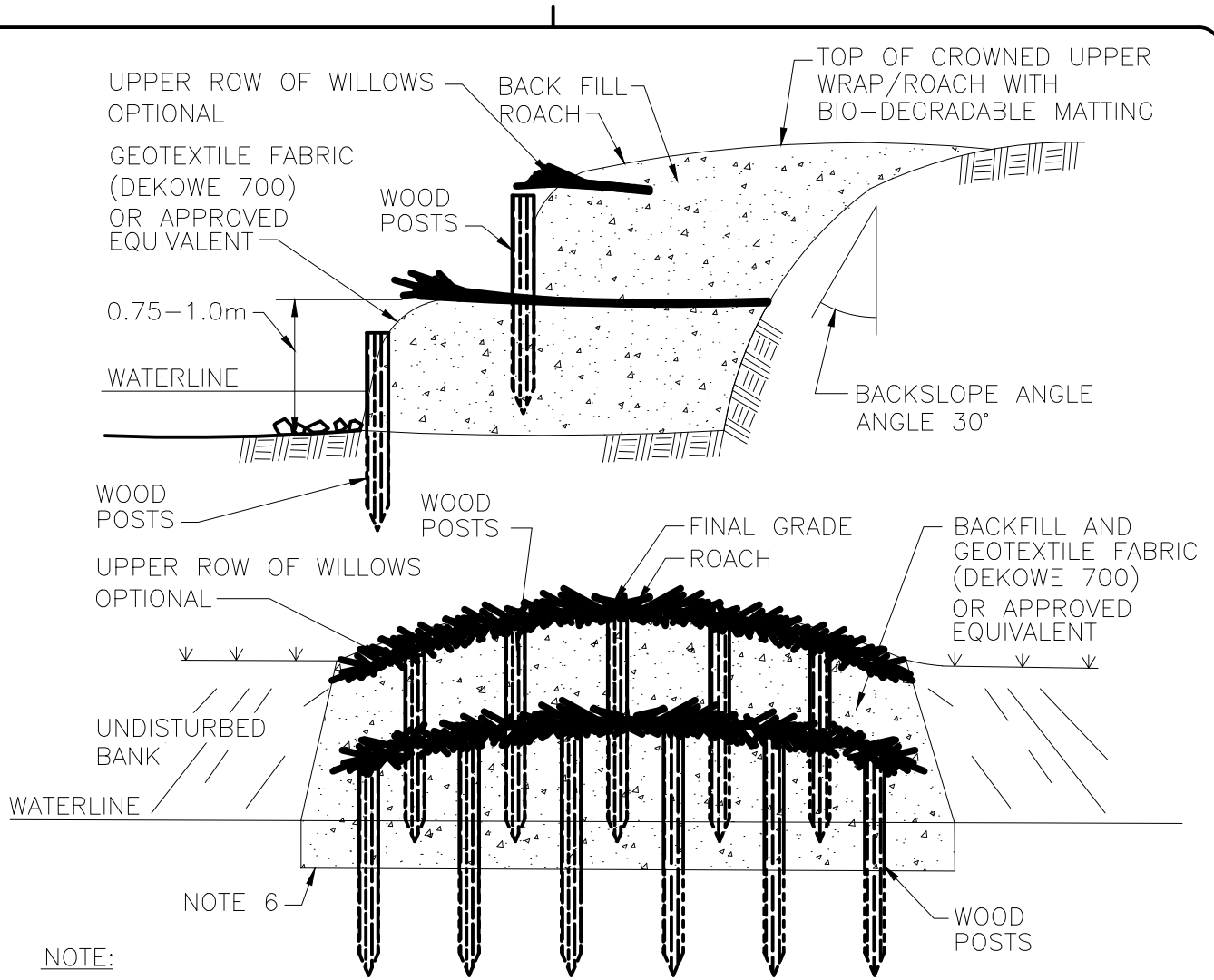
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DESIGN STANDARD

FIA #	STDS	CHAINAGE:	D:SCIPLINE # 03
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TITLE
 STREAMBANK RECLAMATION -
 BRUSH LAYER IN CROSS CUT SLOPE

SCALE N.T.S.	DWG No STDS-03-ML-05-604	REV 01
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NOTE:

1. VEGETATED GEOGRIDS SHOULD BE INSTALLED IN CONJUNCTION WITH DITCH BACKFILLING AND BANK RECONSTRUCTION.
2. UNFROZEN BACKFILL (OR LOOSE GRADE MATERIAL) SHOULD BE USED TO MINIMIZE AIR SPACES. THIS ALLOWS PROPER SOIL FABRIC CONTACT, WHICH MINIMIZES SCOURING DURING RUNOFF AND ENSURES SURVIVAL OF THE WILLOW CUTTINGS, DITCHLINE SHALL BE CROWNED A MINIMUM OF 0.3m HIGHER THEN NATURAL GRADE.
3. PLYWOOD FORMS CUT TO FIT HEIGHT OF LAYER MAY BE REQUIRED TO HELP RECONSTRUCT STEEP OR VERTICAL BANKS. WOOD POSTS OF SUFFICIENT LENGTH ARE REQUIRED AND SHALL BE DRIVEN IN TO SUPPORT THE FACE OF THE VERTICAL LAYERS. WOOD POSTS MUST BE UNTREATED. ENSURE THE FACE OF THE UPPER LAYERS ARE INSET A MINIMUM OF 0.5m FROM THE LAYER BELOW.
4. WILLOWS SHOULD BE HARVESTED AS CLOSE TO INSTALLATION AS POSSIBLE, PREFERABLY THE PREVIOUS DAY BUT NO MORE THAN 2 DAYS EARLY. WILLOWS SHOULD BE 1.5 TO 2.5cm IN DIAMETER AND 2-3.0m LONG WITH NO MORE THAN 25cm LEFT EXPOSED.
5. PLANTING RATE SHOULD BE APPROXIMATELY 1 STEM PER 15cm.
6. ENSURE BASE OF THE LOWEST GEOGRID IS A MINIMUM OF 15cm BELOW THE ELEVATION OF THE NORMAL WATER LEVEL.
7. FOLLOWING COMPLETION OF THE UPPER WRAP, THE UPPER ROW OF WILLOWS SHALL BE INSERTED THROUGH HOLES IN THE DEKOWE FABRIC AND AS DEEP AS PRACTICAL.

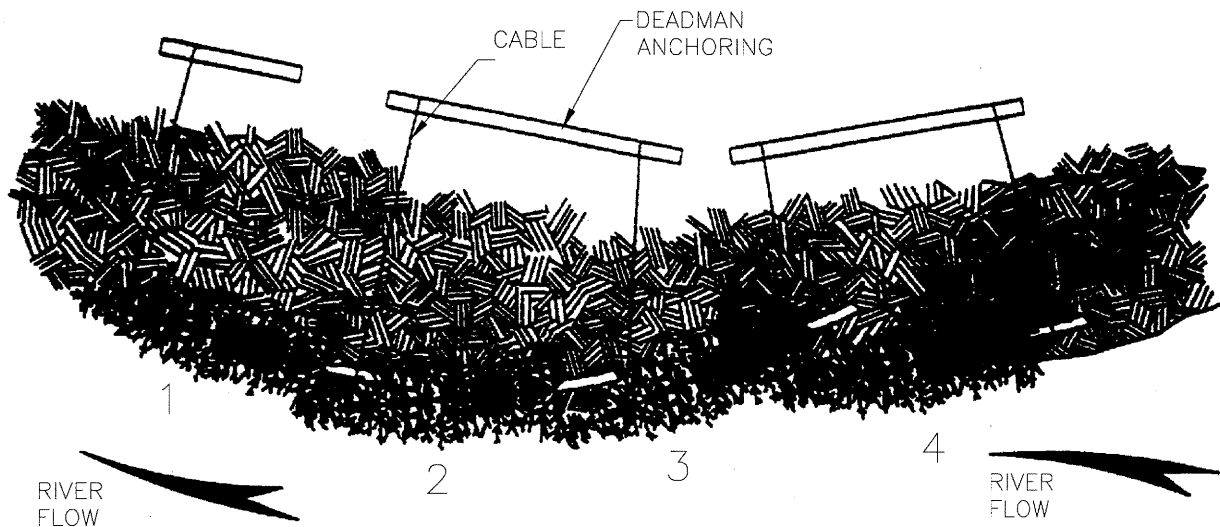
ID REVISIONS 00 PBAS ISSUE (2022-05-06)

TIME DESIGNFILE



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WP	DATE
NAME	DATE
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TITLE	STREAMBANK RECLAMATION- VEGETATED GEOTEXTILE INSTALLATION
SCALE	N.T.S.
DWG No	PBAS-03-ML-05-606
REV	00

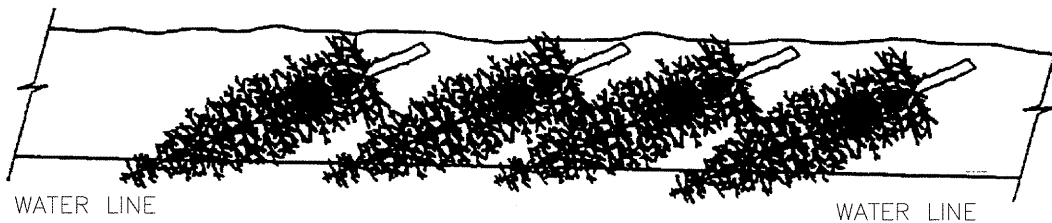


PLAN VIEW

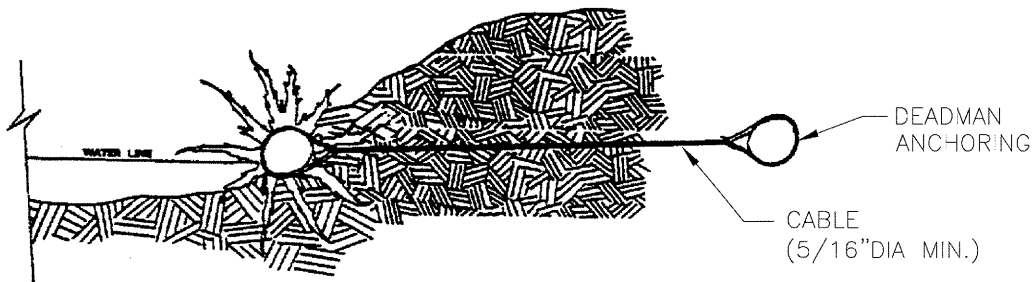
NOTE:

-REVETMENT CONSTRUCTION ORDER. 1, THEN 2...4

-TIP OF TREE 4 TO OVERLAP ON OUTSIDE (WATERSIDE) OF TREE 3



ELEVATION VIEW



SECTION VIEW

NOTE:

TREE TO BE PARTIALLY BURIED IN NEW BANK

01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC

00 SUPERSEDES RB006.PPL 2002/04/24

REVISIONS



DESIGNER:

Douglas By June 3, 2015
NAME DATE

CHECKED BY:

DESIGN CHECKER:

[Signature] *[Signature]*

DESIGN STANDARD

FIA #	STDS	CHAINAGE:	D.SCIPLINE # 03
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TITLE
STREAMBANK RECLAMATION--
TREE REVETMENT

SCALE N.T.S.	DWG No STDS-03-ML-05-607	REV 01
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REVISIONS 00

STANDARD ISSUE, SUPERSEDES A-SK-18-379

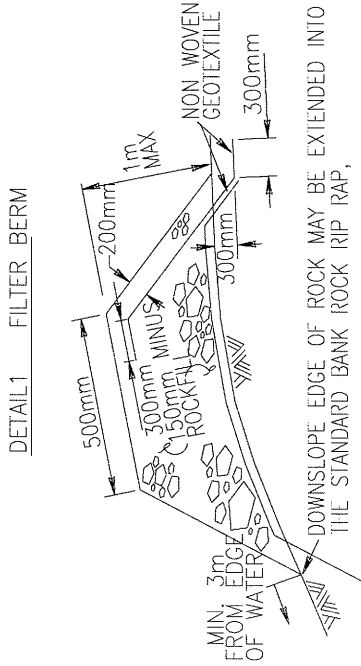
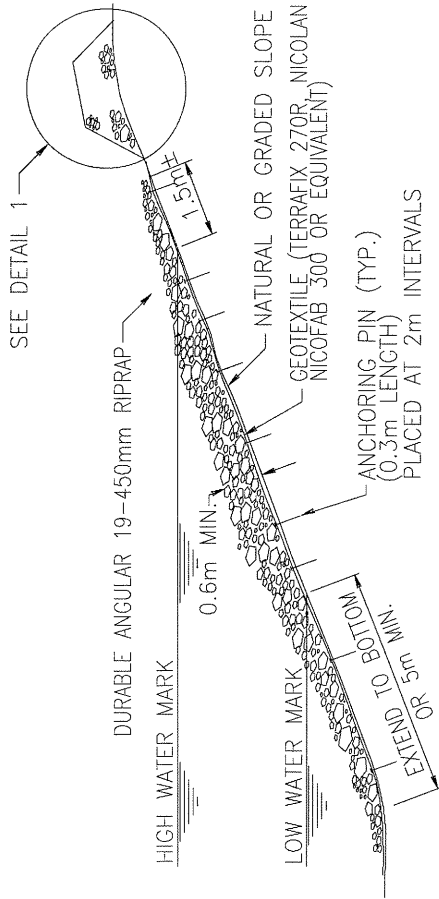
01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC.



DESIGNER: *Douglas King* June 3, 2015
 NAME DATE

CHECKED BY: *[Signature]* DESIGN CHECKER: *[Signature]*

DESIGN STANDARD		D:DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE		WATERCROSSING BANK EROSION PROTECTION	
SCALE N.T.S.	DWG No	STDS-03-VL-05-608	REV 01



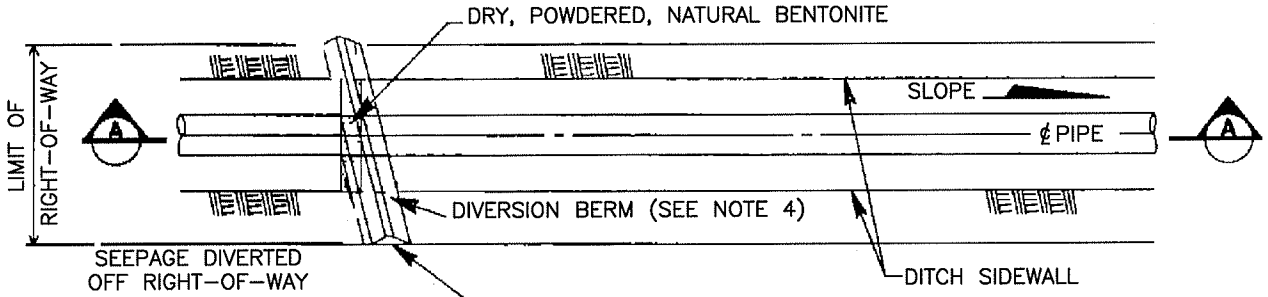
NOTES:

1. REMOVE ALL STUMPS, ORGANIC MATERIAL AND PREPARE BANKS TO A MAXIMUM SLOPE OF 2 HORIZ. : 1 VERTICAL IF PRACTICAL.
2. INSTALL FILTER CLOTH (GEOTEXTILE) UNDER ROCK RIPRAP AS DIRECTED BY THE COMPANY.
3. SIZE OF RIPRAP IS DEPENDENT ON SLOPE OF BANK AND WATER VELOCITY.
4. INSTALL RIPRAP TO A DEPTH OF APPROXIMATELY 1.5 TO 2 TIMES. THE MAXIMUM EQUIVALENT DIAMETER OF THE RIPRAP.
5. KEY IN EDGES OF RIPRAP & FILTER CLOTH TO NATURAL GROUND CONTOURS SO THAT UNDERMINING DOES NOT OCCUR.
6. RIPRAP IS TO BE INSTALLED TO 0.5m ABOVE HIGH WATER MARK OR 1.5m± ALONG THE SLOPE, WHICHEVER IS LESS.
7. FILTER BERM TO BE CONSTRUCTED ON AN AS REQUESTED BASIS BY THE COMPANY REPRESENTATIVE.
8. BANK PROTECTION SHALL NOT CHANGE PRE-EXISTING NATURAL FLOW CONDITIONS OR BANK PROFILE WIDTHS, UNLESS OTHERWISE APPROVED BY THE COMPANY.

NOTES:

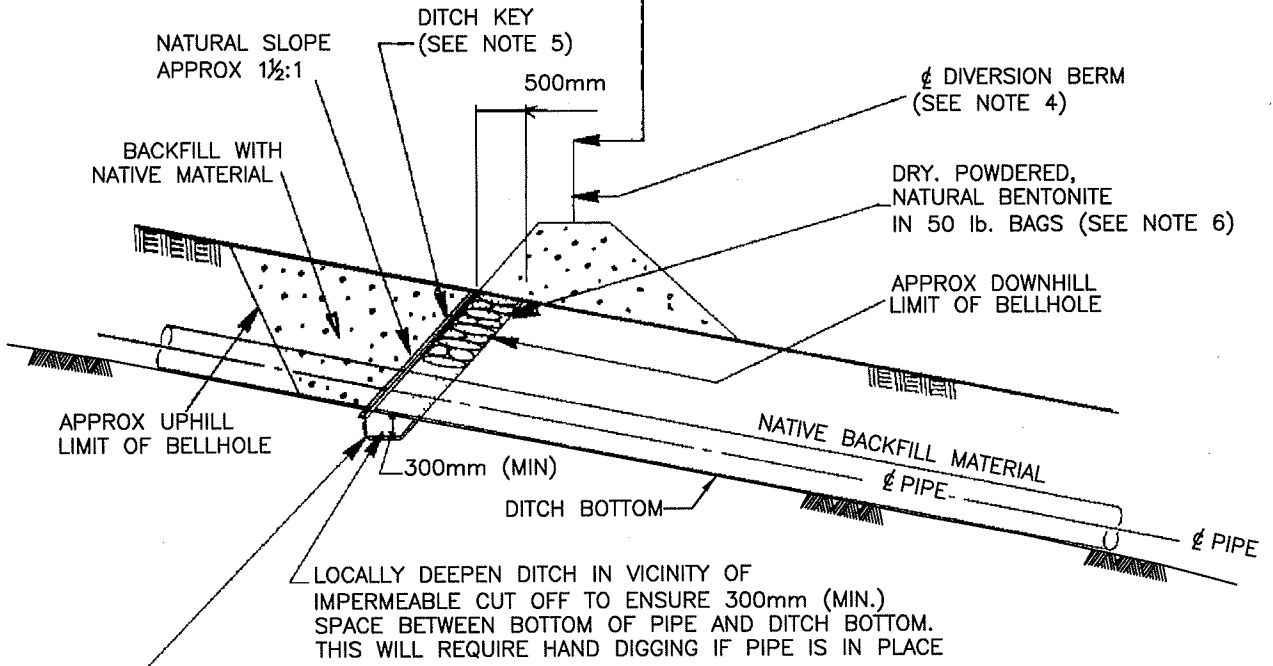
1. GEOTEXTILE TO BE A NON WOVEN FABRIC SUCH AS MIRAFIX P250 OR TERRAFIX 300R.
2. FILTER BERM TO BE CONSTRUCTED ON STABLE SLOPE SURFACES ONLY.
3. GEOTEXTILE FOR FILTER BERM TO BE INDEPENDENT OF GEOTEXTILE REQUIRED FOR THE EMBANKMENT.
4. MINIMUM 300mm OVERLAP OF GEOTEXTILE

---TIME---
---DESIGNFILE---



PLAN
(NTS)

DIVERSION BERM LOCATED SUCH THAT UPHILL TOE OF FILL APPROXIMATELY COINCIDES WITH UPHILL EDGE OF IMPERMEABLE CUT OFF AT ϕ OF PIPE



LOCALLY DEEPEN DITCH IN VICINITY OF IMPERMEABLE CUT OFF TO ENSURE 300mm (MIN.) SPACE BETWEEN BOTTOM OF PIPE AND DITCH BOTTOM. THIS WILL REQUIRE HAND DIGGING IF PIPE IS IN PLACE

SECTION A
NTS

REVISIONS 00 SUPERCEDES SK-1391B (APR. 22/02) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



DESIGNER: *[Signature]*
 PROFESSIONAL ENGINEER OF ALBERTA
 YIXIN LIU
 AUG 26 2012
 CHECKED BY: *[Signature]* DESIGN CHECKER: *[Signature]*

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE TYPICAL BENTONITE DITCH PLUG			
SCALE N.T.S.	DWG No	STDS-03-ML-12-202 SHT 01 OF 02	REV 01

NOTES

1. DITCH PLUGS, WHERE REQUIRED, WILL TYPICALLY BE SPECIFIED ON THE DRAWINGS. HOWEVER, THE FREQUENCY AND FINAL LOCATION OF DITCH PLUGS ARE THE RESPONSIBILITY OF THE COMPANY REPRESENTATIVE AND ARE LOCATED ON THE BASIS OF FIELD OBSERVATIONS, LOCAL TOPOGRAPHY, AND DRAINAGE PATTERNS.
2. DITCH PLUGS ARE TO BE INSTALLED AT LOCATIONS WHERE THERE IS A POSSIBILITY OF GROUNDWATER SEEPAGE FLOWING EITHER WITHIN OR ALONG THE BACKFILLED PIPE DITCH. DITCH PLUGS SHOULD BE LOCATED IMMEDIATELY DOWNSLOPE OF AREAS OF SIGNIFICANT GROUNDWATER SEEPAGE OR AREAS OF CONCENTRATED CROSS SLOPE DRAINAGE. DITCH PLUGS ARE BEST LOCATED AT THE CREST OF STEEPER SLOPES TO ASSIST IN REMOVING WATER FROM THE PIPE DITCH BEFORE IT FLOWS ON A STEEPER GRADIENT. DITCH PLUGS ARE NOT TO BE PLACED IN GRADE CUT, UNLESS INDICATED ON SPECIFIC DESIGN DRAWING.
3. DITCH PLUGS SHOULD BE LOCATED PRIOR TO PIPE LOWER-IN AND BACKFILLING. SUFFICIENT OPEN DITCH MUST BE MAINTAINED TO INSTALL DITCH PLUG (APPROXIMATELY 5 METRES AT DITCH BOTTOM). DITCH PLUGS SHOULD BE CONSTRUCTED AS SOON AS PRACTICABLE AFTER PIPE INSTALLATION AND GENERAL BACKFILLING TO MINIMIZE DITCH WALL SLUMPING, WATER INFILTRATION, OR FROST PENETRATION INTO DITCH WALLS DURING WINTER CONSTRUCTION.
4. SEE DRAWING No. STDS-03-ML-12-221 AND STDS-03-ML-12-222 FOR DESIGN OF DIVERSION BERMS.
5. DITCH PLUG SHALL BE KEYED INTO THE DITCH SIDES AND BOTTOM TO A DEPTH AND WIDTH OF 0.3m.
6. FOLLOWING PLACEMENT, EACH BENTONITE BAG SHALL BE PERFORATED ONCE IN PLACE TO ALLOW FOR THE INFILTRATION OF WATER, THEREBY PERMITTING THE EXPANSION OF BENTONITE.
7. LOOSE BENTONITE SHALL BE PLACED BENEATH AND UP THE SIDES OF THE PIPE TO ENSURE ALL VOIDS ARE FILLED.
8. BAGS ORIENTATION SHOULD ALTERNATE.
9. REFER TO PROJECT SPECIFICATIONS WHERE PIPE PROTECTION MATERIALS (SAND PADDING, PILLOWS, ROCK SHIELD, ETC) ARE REQUIRED.

MATERIAL REQUIRED

DRY POWDERED NATURAL BENTONITE IN 50lb BAGS
 FILTER CLOTH : NILEX-24 NON-WOVEN GEOTEXTILE OR APPROVED EQUIVALENT.

REVISIONS 00 SUPERCEDES SK-1391B (APR. 22/02) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



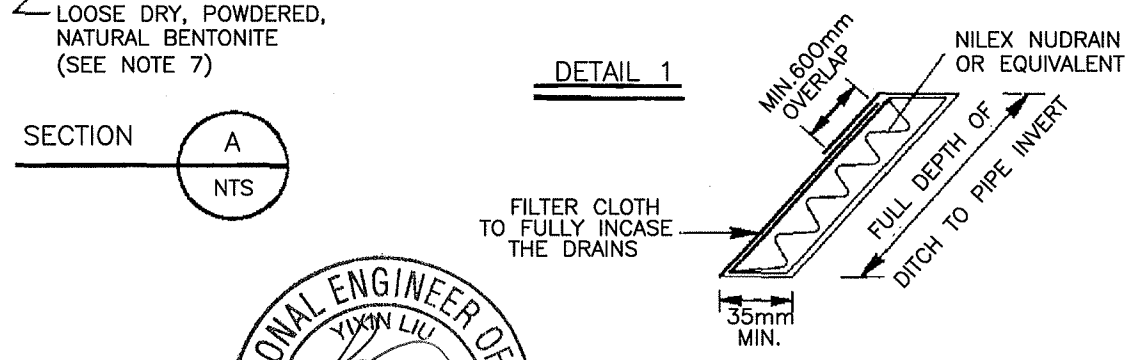
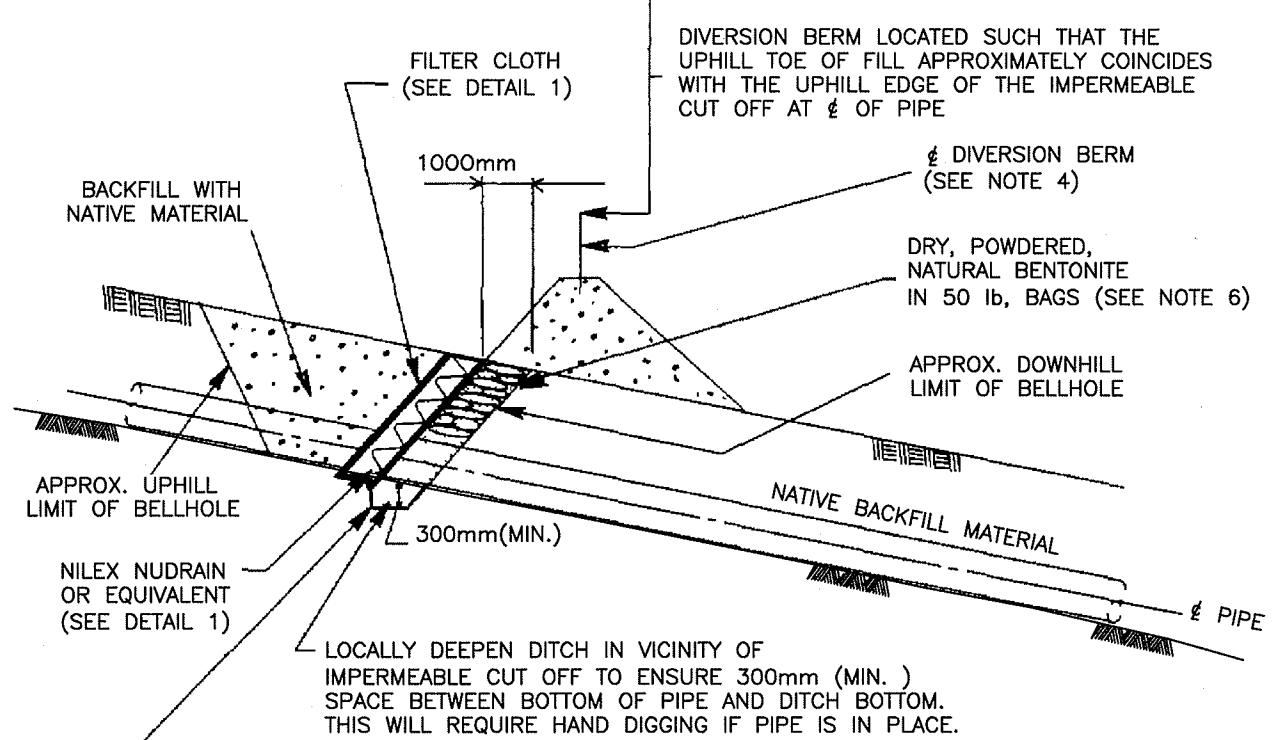
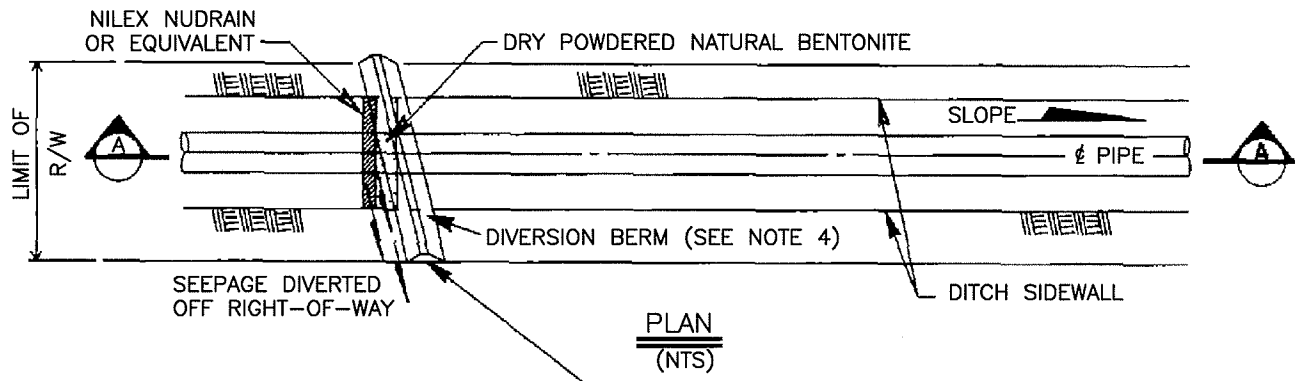
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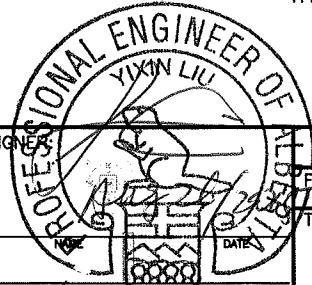
PROFESSIONAL ENGINEER OF ALBERTA
 449-29720

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE			
TYPICAL BENTONITE DITCH PLUG			
SCALE N.T.S.	DWG No	STDS-03-ML-12-202 SHT 02 OF 02	REV 01

TIME DESIGNFILE



REVISIONS 00 THIS DRAWING SUPERCEDES SK-1391A (1/2) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



DESIGNER:	DESIGN STANDARD		
DATE:	STDS	CHAINAGE:	DISCIPLINE # 03
CHECKED BY:	TITLE		
DESIGN CHECKER:	TYPICAL BENTONITE DITCH PLUG USING NUDRAIN OR EQUIVALENT		
SCALE N.T.S.	DWG No	STDS-03-ML-12-203 SHT 01 OF 02 REV 01	

NOTES

1. DITCH PLUGS, WHERE REQUIRED, WILL TYPICALLY BE SPECIFIED ON THE DRAWINGS. HOWEVER, THE FREQUENCY AND FINAL LOCATION OF DITCH PLUGS ARE THE RESPONSIBILITY OF THE COMPANY'S AUTHORIZED REPRESENTATIVE AND ARE LOCATED ON THE BASIS OF FIELD OBSERVATIONS, LOCAL TOPOGRAPHY, AND DRAINAGE PATTERNS.
2. DITCH PLUGS ARE TO BE INSTALLED AT LOCATIONS WHERE THERE IS A POSSIBILITY OF GROUNDWATER SEEPAGE FLOWING EITHER WITHIN OR ALONG THE BACKFILLED PIPE DITCH. DITCH PLUGS SHOULD BE LOCATED IMMEDIATELY DOWNSLOPE OF AREAS OF SIGNIFICANT GROUNDWATER SEEPAGE OR AREAS OF CONCENTRATED CROSS SLOPE DRAINAGE. DITCH PLUGS ARE BEST LOCATED AT THE CREST OF STEEPER SLOPES TO ASSIST IN REMOVING WATER FROM THE PIPE DITCH BEFORE IT FLOWS ON A STEEPER GRADIENT.
3. DITCH PLUGS SHOULD BE LOCATED PRIOR TO PIPE LOWER-IN AND DITCH BACKFILLING. SUFFICIENT OPEN DITCH MUST BE MAINTAINED TO INSTALL DITCH PLUG (APPROXIMATELY 3 METRES AT DITCH BOTTOM). DITCH PLUGS SHOULD BE CONSTRUCTED AS SOON AS PRACTICABLE AFTER PIPE INSTALLATION AND GENERAL BACKFILLING TO MINIMIZE DITCH WALL SLUMPING, WATER INFILTRATION OR FROST PENETRATION INTO DITCH WALLS DURING WINTER CONSTRUCTION.
4. SEE DRAWING STDS-03-ML-12-221 AND STDS-03-ML-12-222 FOR DESIGN OF DIVERSION BERMS.
5. FILTER CLOTH TO BE WRAPPED TO TOTALLY ENCLOSE SUBDRAIN IN THE ZONE ILLUSTRATED IN DETAIL 1. A MINIMUM OVERLAP OF 600mm IS REQUIRED.
6. EACH BENTONITE BAG SHALL BE PERFORATED ONCE IN PLACE, TO ALLOW FOR THE INFILTRATION OF WATER THEREBY PERMITTING THE EXPANSION OF BENTONITE.
7. LOOSE BENTONITE SHALL BE PLACED BENEATH AND UP THE SIDES OF THE PIPE TO ENSURE ALL VOIDS ARE FILLED.

MATERIAL REQUIRED

DRY POWDERED NATURAL BENTONITE IN 50 lb. BAGS
 FILTER CLOTH : NILEX C-24 NON-WOVEN GEOTEXTILE OR APPROVED EQUIVALENT.
 SUBRAIN : NILEX NUDRAIN OR EQUIVALENT

GENERAL ISSUE -- REVIEWED FOR 2015 SPEC

01

THIS DRAWING SUPERCEDES SK-1391A (2/2)

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REVISIONS



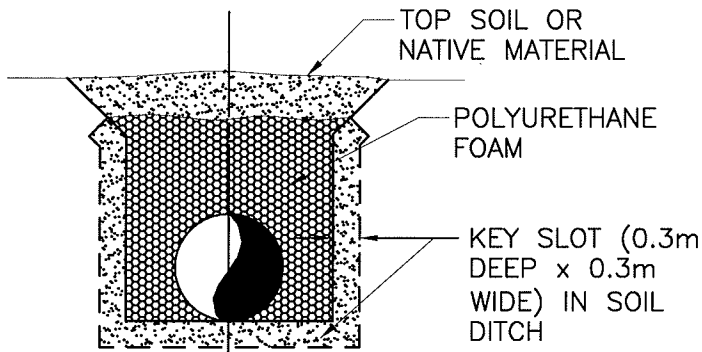
PROFESSIONAL ENGINEER OF ALBERTA
 YIXIN LIU

DESIGNER

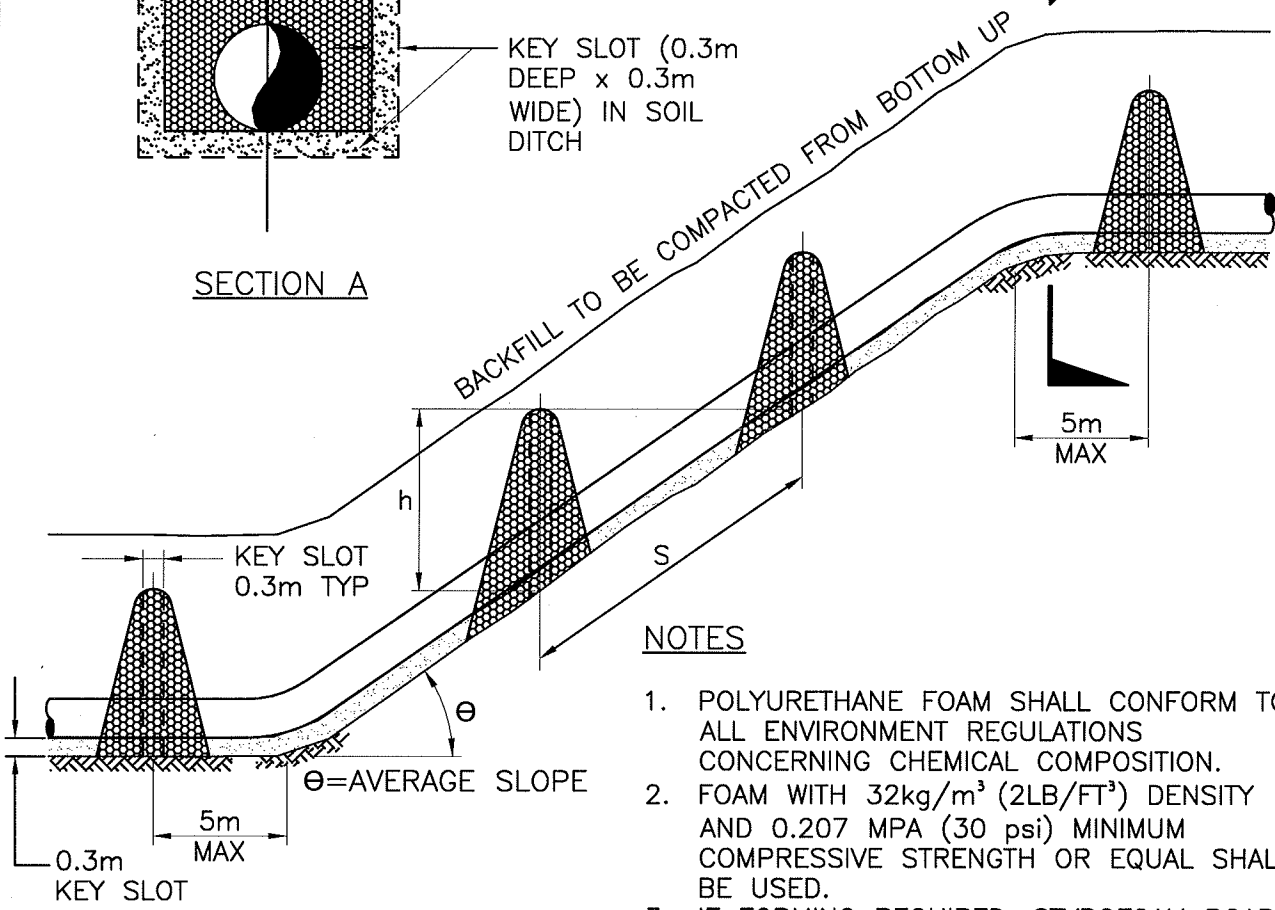
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DESIGN STANDARD		DISCIPLINE #	03
FIA #	STDS	CHAINAGE:	
TITLE			
TYPICAL BENTONITE DITCH PLUG USING NUDRAIN OR EQUIVALENT			
SCALE N.T.S.		DWG No	STDS-03-ML-12-203 SHT 02 OF 02
			REV 01

TIME DESIGNFILE



SECTION A



NOTES

1. POLYURETHANE FOAM SHALL CONFORM TO ALL ENVIRONMENT REGULATIONS CONCERNING CHEMICAL COMPOSITION.
2. FOAM WITH 32kg/m³ (2LB/FT³) DENSITY AND 0.207 MPA (30 psi) MINIMUM COMPRESSIVE STRENGTH OR EQUAL SHALL BE USED.
3. IF FORMING REQUIRED, STYROFOAM BOARD CAN BE USED.
4. IN VALLEYS, DRAINAGE AREAS OR AREAS WHERE WATER MAY FLOW ALONG TRENCH AND REMOVE PADDING OR BACKFILL FROM AROUND THE PIPE. ADJUST SPACING OR BREAKERS SO TOP OF BREAKER IS AT APPROXIMATELY THE SAME ELEVATION AS BOTTOM OF UPHILL BREAKER.
5. BREAKER SPACING AND CONFIGURATION MAY BE CHANGED AS DIRECTED BY COMPANY. DEPTH OF DITCH VARIES WITH SITE CONDITIONS.
6. REFER TO PROJECT SPECIFICATIONS WHERE PIPE PROTECTION MATERIALS (SAND PADDING, PILLOWS, ROCK SHIELD, ETC.) ARE REQUIRED.

APPROXIMATE BREAKER SPACING

$$S = \frac{h}{\sin \theta}$$

GENERAL ISSUE - REVIEWED FOR 2015 SPEC

01

THIS DRAWING SUPERCEDES SK-1391A (2/2)

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REVISIONS



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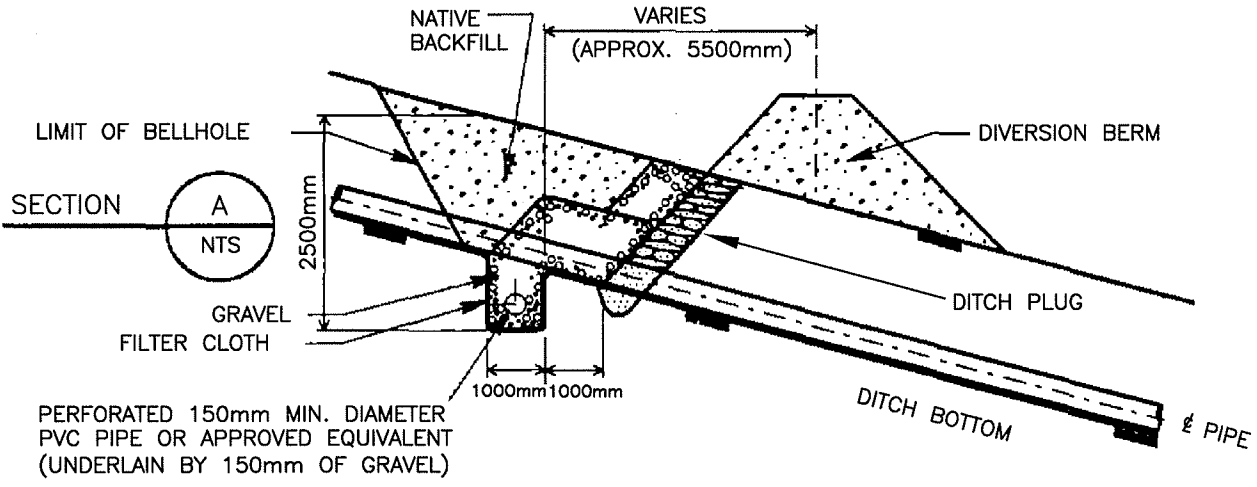
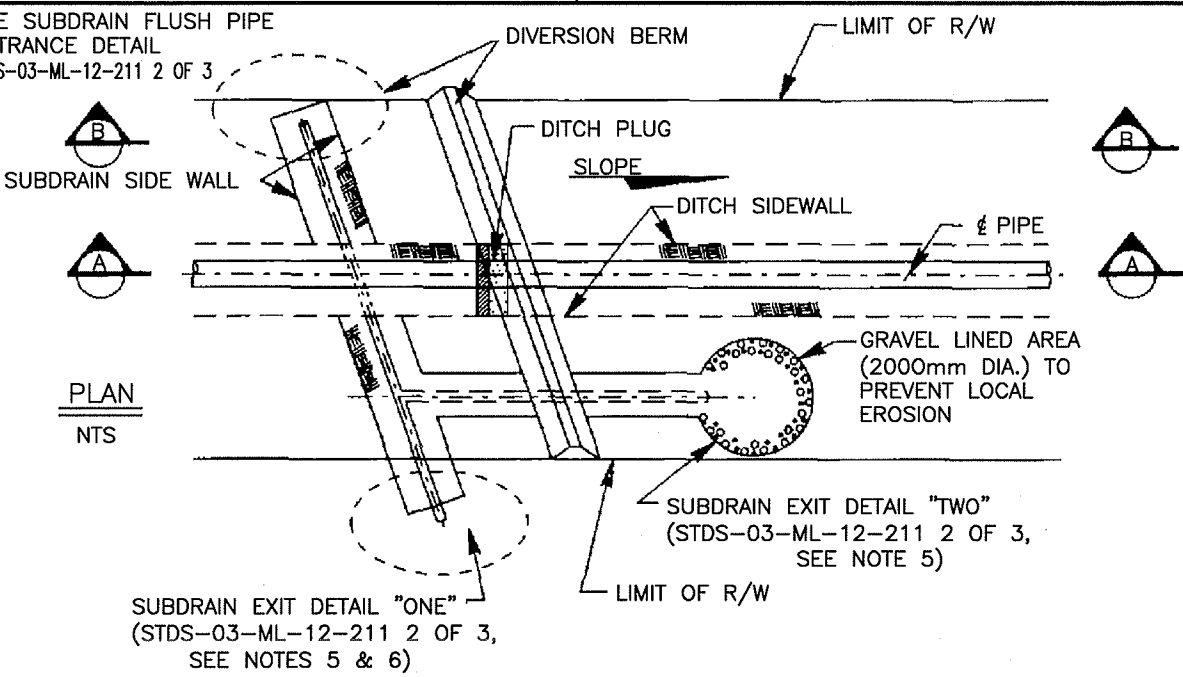
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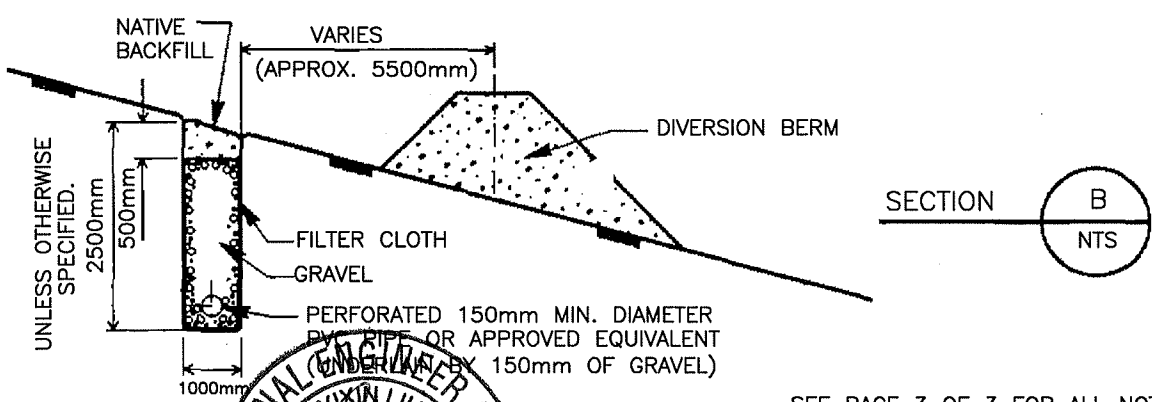
PROFESSIONAL ENGINEER OF ALBERTA

DESIGN STANDARD			
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TITLE			
TYPICAL POLYURETHANE FOAM BREAKER			
SCALE N.T.S.	DWG No	STDS-03-ML-12-204	REV 01

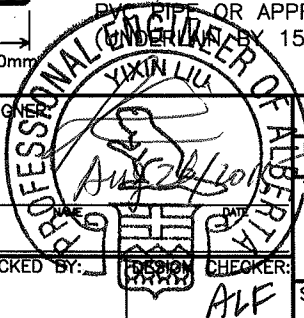
SEE SUBDRAIN FLUSH PIPE
ENTRANCE DETAIL
STDS-03-ML-12-211 2 OF 3



PERFORATED 150mm MIN. DIAMETER
PVC PIPE OR APPROVED EQUIVALENT
(UNDERLAIN BY 150mm OF GRAVEL)



SEE PAGE 3 OF 3 FOR ALL NOTES

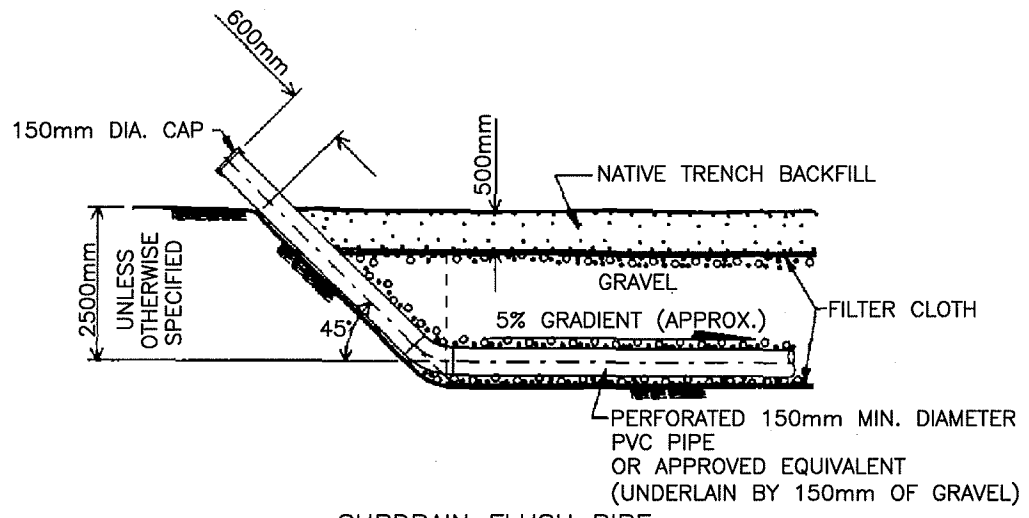


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CHECKED BY:	TITLE		
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SCALE N.T.S.	DWG No	REV 01	
	STDS-03-ML-12-211		

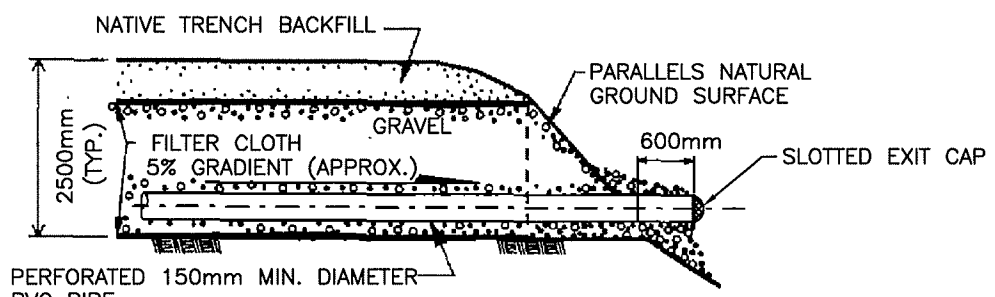
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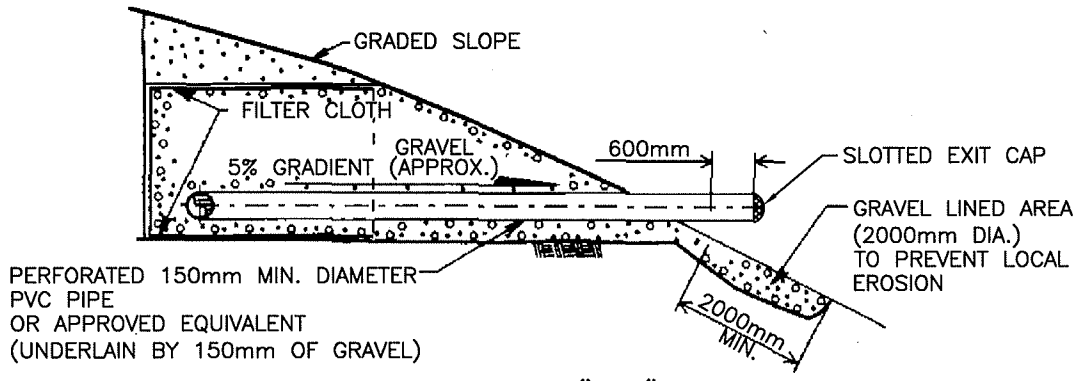
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SUBDRAIN FLUSH PIPE ENTRANCE DETAIL



SUBDRAIN EXIT DETAIL "ONE"



SUBDRAIN EXIT DETAIL "TWO"

SEE PAGE 3 OF 3 FOR ALL NOTES.



DESIGNER: *YIXIN LIU*

CHECKED BY: *ALP*

PROFESSIONAL ENGINEER OF ALBERTA

DESIGN STANDARD		DISCIPLINE # 03	
EIA #	STDS	CHAINAGE:	
TITLE		TYPICAL SUBDRAIN USING GRAVEL (SHT. 02 OF 03)	
SCALE N.T.S.	DWG No	STDS-03-ML-12-211	REV 01

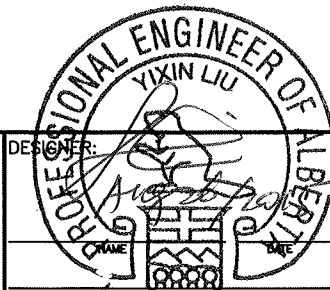
NOTES

1. SUBDRAINS ARE TYPICALLY USED TO LOWER A HIGH GROUNDWATER TABLE WITHIN THE PIPELINE RIGHT-OF-WAY. THEY ARE GENERALLY LOCATED AT THE CREST OF SLOPES OR IMMEDIATELY DOWNSLOPE OF AREAS EXHIBITING SIGNIFICANT GROUNDWATER EXIT.
2. SUBDRAINS WHERE REQUIRED, WILL BE SPECIFIED ON THE DRAWINGS. HOWEVER, THE THE LOCATIONS SHOWN ARE APPROXIMATE AND FINAL POSITIONING OF THE SUBDRAIN IS THE RESPONSIBILITY OF THE COMPANY'S AUTHORIZED REPRESENTATIVE. LOCAL TOPOGRAPHY, DRAINAGE PATTERNS, AND OBSERVED GROUNDWATER CONDITIONS – PARTICULARLY AFTER DITCH EXCAVATION – WILL GOVERN THE FINAL SUBDRAIN LOCATION.
3. APPROXIMATE SLOPE OF SUBDRAIN TO BE 5%.
4. FILTER CLOTH FOR SUBDRAINS TO BE LAID IN OPEN TRENCH FOLLOWED BY 150mm OF GRAVEL. PERFORATED PIPE SHOULD BE PLACED WITH THE PERFORATIONS AT A MINIMUM BEING ON THE UNDERSIDE AT 4 AND 8 O'CLOCK POSITIONS. REMAINDER OF TRENCH SHOULD BE BACKFILLED WITH CLEAN, WELL GRADED GRAVEL TO WITHIN 500mm OF GRADE AND THE FILTER CLOTH OVERLAPPED TO TOTALLY ENCLOSE GRAVEL. COMPLETE BACKFILLING WITH NATIVE MATERIAL TO PREVENT SURFACE WATER FROM ENTERING SUBDRAIN.
5. SUBDRAIN EXIT DETAIL "ONE" USED WHERE SUBDRAIN EXITS SLOPE WITHIN A REASONABLE DISTANCE AND NATURAL CONTOURS DIRECT WATER OFF RIGHT-OF-WAY. WHERE SUBDRAIN IS REQUIRED IN THROUGHOUT AREA OR WHERE A "DETAIL ONE" EXIT POINT WOULD BE LOCATED GREATER THAN 10 METRES OUTSIDE THE RIGHT-OF-WAY LIMITS THEN THE DIRECTION OF SUBDRAIN IS DIRECTED SO THAT IT EXITS ALONG THE EDGE OF THE RIGHT-OF-WAY. (SEE EXIT DETAIL "TWO")
6. WHERE SUBDRAIN EXIT IS LOCATED BEYOND THE RIGHT-OF-WAY LIMITS, LAND APPROVALS ARE REQUIRED.

MATERIALS REQUIRED

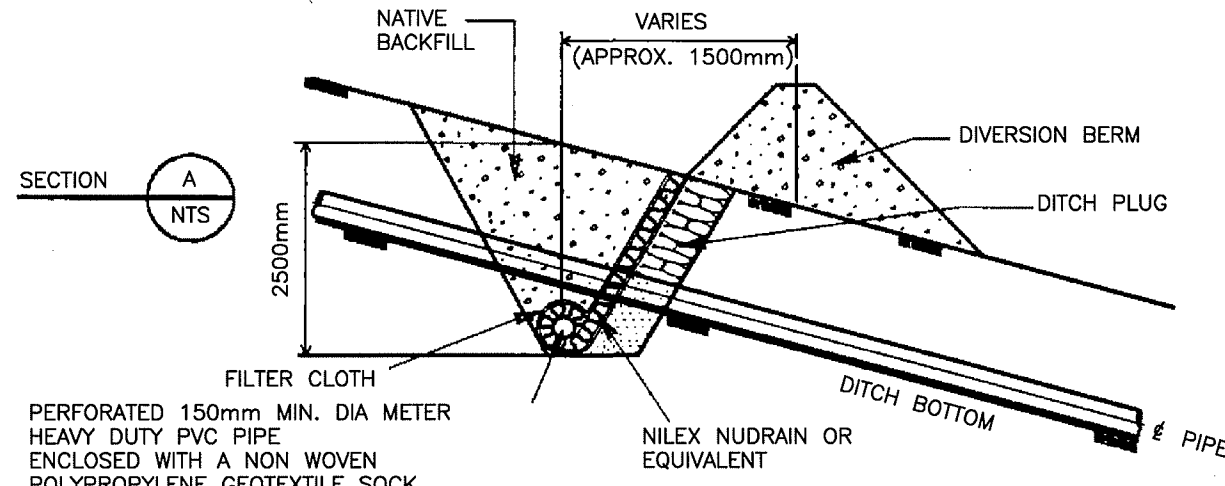
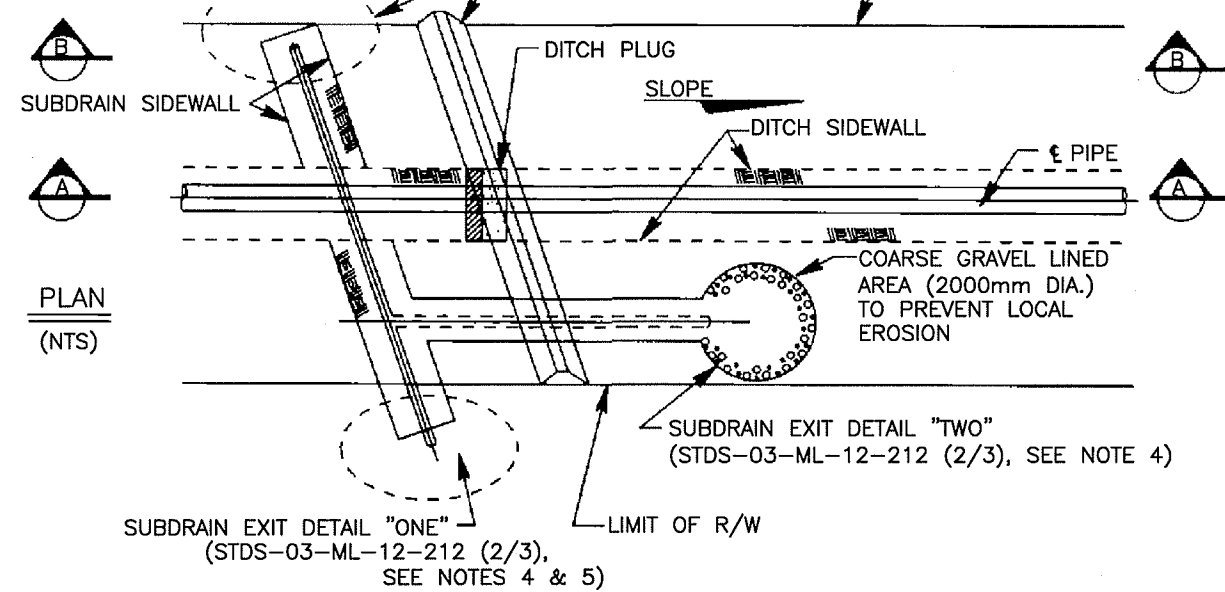
- GRAVEL: WELL GRADED. LESS THAN 5% PASSING No.200 SIEVE
- FILTER CLOTH: NILEX C-24 NON-WOVEN GEOTEXTILE OR APPROVED EQUIVALENT.
- PERFORATED PIPE: 150mm MINIMUM DIAMETER, PERFORATED, PVC OR APPROVED EQUIVALENT
- END CAPS FOR DRAIN EXIT AND ENTRY. EXIT CAPS SHALL BE SLOTTED.

REVISIONS 00 THIS DRAWING SUPERCEDES SK-1392B (3/3) 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC



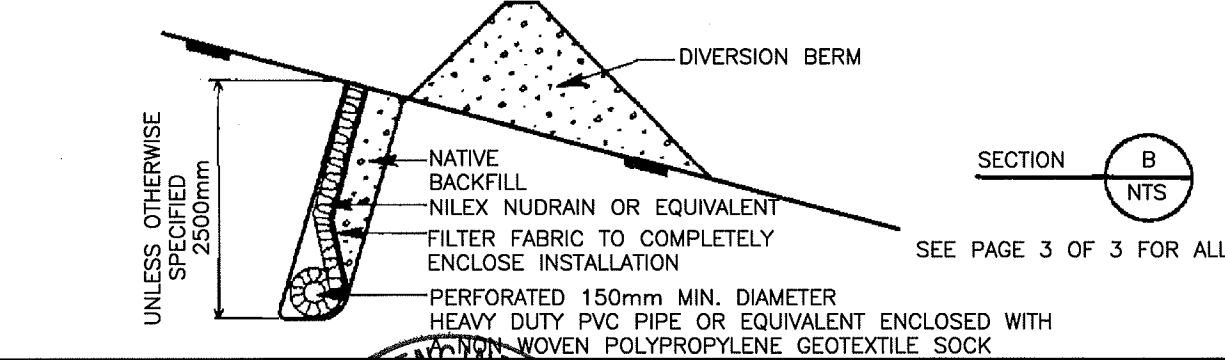
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CHECKED/BY:		TITLE		
DESIGN CHECKER:		TYPICAL SUBDRAIN USING GRAVEL (SHT. 03 OF 03)		
SCALE N.T.S.	DWG No	STDS-03-ML-12-211	REV	01

SEE SUBDRAIN FLUSH PIPE ENTRANCE DETAIL STDS-03-ML-12-212



PERFORATED 150mm MIN. DIA METER HEAVY DUTY PVC PIPE ENCLOSED WITH A NON WOVEN POLYPROPYLENE GEOTEXTILE SOCK

NILEX NUDRAIN OR EQUIVALENT



SEE PAGE 3 OF 3 FOR ALL NOTES



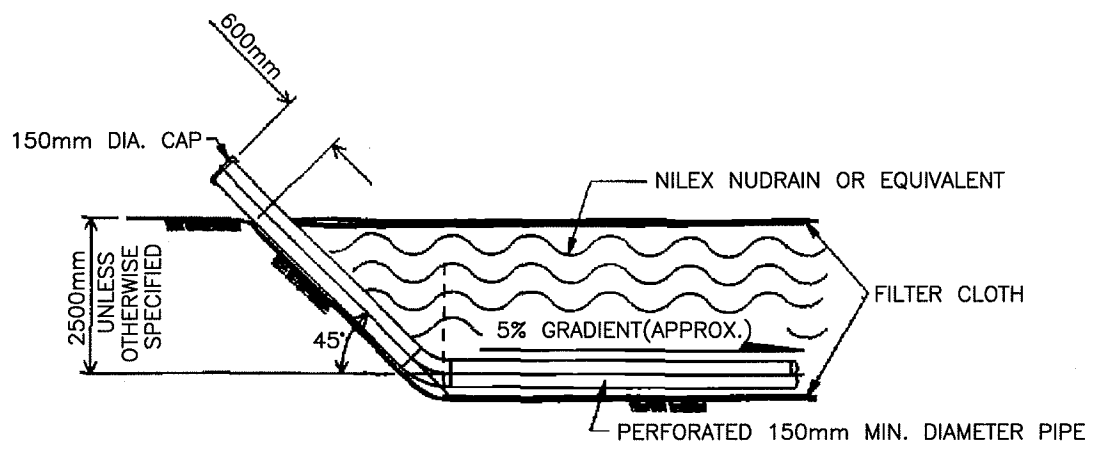
DESIGNER: YIXIN LIU
 PROFESSIONAL ENGINEER OF ALBERTA
 40220/2015
 CHECKED BY: [Signature]
 DESIGN CHECKER: [Signature]

DESIGN STANDARD			
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TITLE			
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SCALE N.T.S.	DWG No	STDS-03-ML-12-212	REV 01

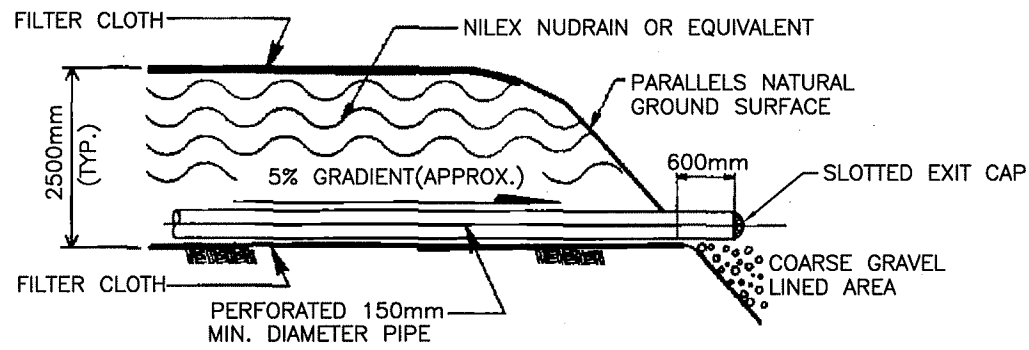
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TIME DESIGNFILE

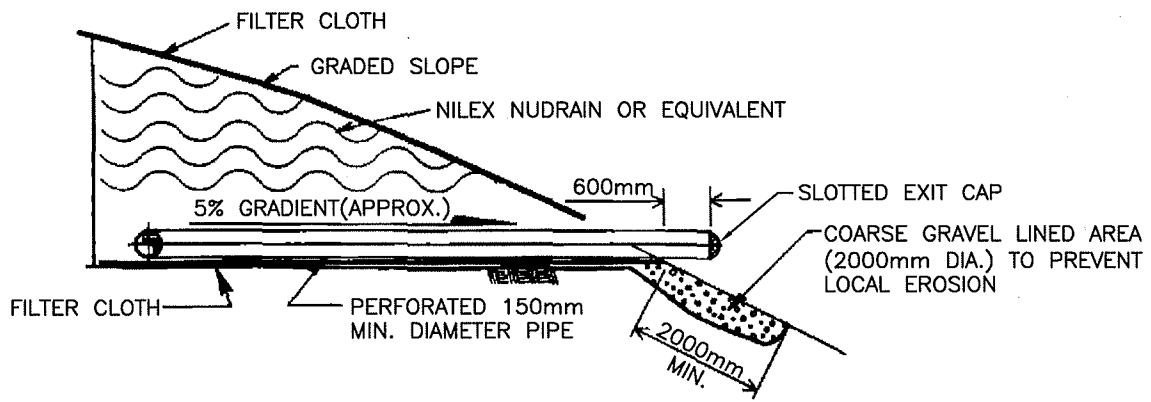
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**SUBDRAIN FLUSH PIPE
ENTRANCE DETAIL**



SUBDRAIN EXIT DETAIL "ONE"



SUBDRAIN EXIT DETAIL "TWO"

SEE PAGE 3 OF 3 FOR ALL NOTES.



DESIGNER: **YIXIN LIU**

CHECKED BY: **BUSIANG**

DESIGN CHECKER: **YIXIN LIU**

PROFESSIONAL ENGINEER OF ALBERTA

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE			
TYPICAL SUBDRAIN (SHT. 02 OF 03)			
SCALE N.T.S.	DWG No	STDS-03-ML-12-212	REV 01

NOTES

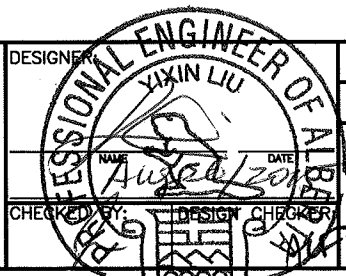
1. SUBDRAINS ARE TYPICALLY USED TO LOWER A HIGH GROUNDWATER TABLE WITHIN THE PIPELINE RIGHT-OF-WAY. THEY ARE GENERALLY LOCATED AT THE CREST OF SLOPES OR IMMEDIATELY DOWNSLOPE OF AREAS EXHIBITING SIGNIFICANT GROUNDWATER EXIT.
2. SUBDRAINS WILL BE SPECIFIED ON THE DRAWINGS WHERE REQUIRED. HOWEVER, THE LOCATIONS SHOWN ARE APPROXIMATE AND FINAL POSITIONING OF THE SUBDRAIN IS THE RESPONSIBILITY OF THE COMPANY'S AUTHORIZED REPRESENTATIVE. LOCAL TOPOGRAPHY, DRAINAGE PATTERNS AND OBSERVED GROUNDWATER CONDITIONS, PARTICULARLY AFTER DITCH EXCAVATION, WILL GOVERN THE FINAL SUBDRAIN LOCATION.
3. APPROXIMATE SLOPE OF SUBDRAIN TO BE 5%.
4. SUBDRAIN EXIT DETAIL "ONE" USED WHERE SUBDRAIN EXITS SLOPE WITHIN A REASONABLE DISTANCE AND NATURAL CONTOURS DIRECT WATER OFF RIGHT-OF-WAY. WHERE SUBDRAIN IS REQUIRED IN THROUGH CUT AREA, OR WHERE A "DETAIL ONE" EXIT POINT WOULD BE LOCATED GREATER THAN 10 METRES OUTSIDE THE RIGHT-OF-WAY LIMITS THEN THE DIRECTION OF SUBDRAIN IS DIRECTED SO THAT IT EXITS ALONG THE EDGE OF THE RIGHT-OF-WAY. (SEE EXIT DETAIL "TWO")
5. WHERE SUBDRAIN EXIT IS LOCATED BEYOND THE RIGHT-OF-WAY LIMITS, LAND APPROVAL IS REQUIRED.

MATERIALS REQUIRED

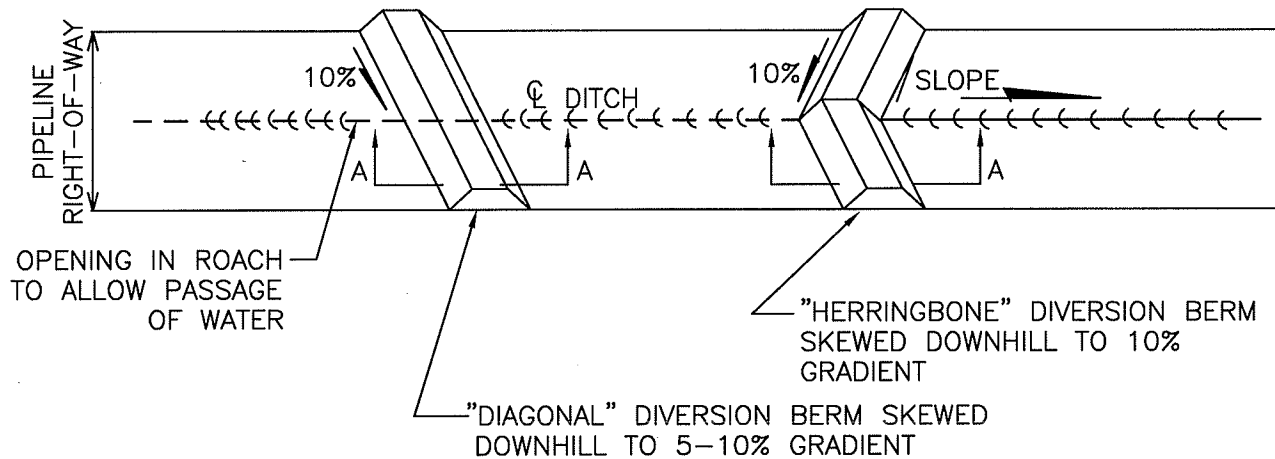
- NILEX NUDRAIN OR EQUIVALENT
- FILTER CLOTH: NILEX C-24 NON-WOVEN GEOTEXTILE OR APPROVED EQUIVALENT.
- PERFORATED PIPE: 150mm MINIMUM DIAMETER, PERFORATED, PVC OR APPROVED EQUIVALENT
- SOCK : NILEX SOCK - NON WOVEN POLYPROPYLENE GEOTEXTILE FOR 150mm DIAMETER PIPE
- COARSE GRAVEL : CLEAN, UNIFORM GRADED ROCK BETWEEN 10mm AND 100mm SIZE.
- END CAPS FOR DRAIN EXIT AND ENTRY. EXIT CAPS SHALL BE SLOTTED.

REVISIONS 00 THIS DRAWING SUPERCEDES SK-1392A (3/3) 01 GENERAL ISSUE -- REVIEWED FOR 2015 SPEC

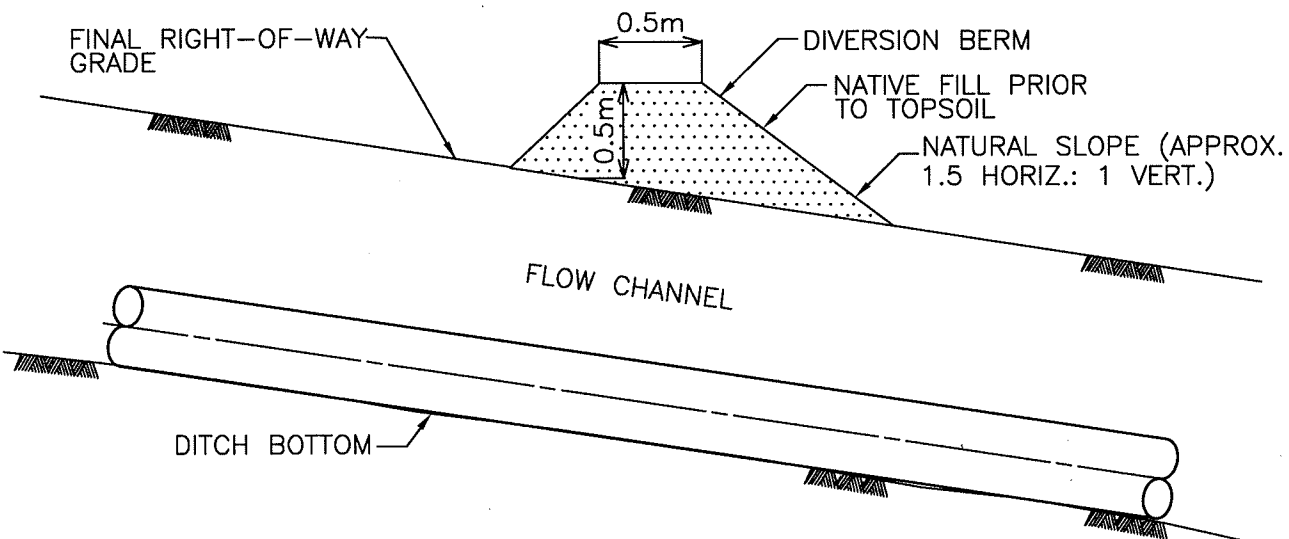
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DESIGNER YIXIN LIU		DESIGN STANDARD	
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE TYPICAL SUBDRAIN (SHT. 03 OF 03)			
CHECKED BY:	DESIGN CHECKER:	SCALE N.T.S.	DWG No STDS-03-ML-12-212
			REV 01



PLAN



SECTION A-A

REVISIONS 00 THIS DRAWING SUPERCEDES SK-1390A (1/2) 01 GENERAL UPDATE FOR 2015

TIME DESIGNFILE



DESIGNER: YIXIN LIU

CHECKED BY: [Signature]

DESIGN CHECKER: [Signature]

PROFESSIONAL ENGINEER OF ALBERTA

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE: TYPICAL DIVERSION BERMS (SHT. 01 OF 02)			
SCALE N.T.S.	DWG No	STDS-03-ML-12-221	REV 01

NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. "DIAGONAL" DIVERSION BERMS ARE USED:
-WHERE THE EXISTING TOPOGRAPHY AND SLOPE DRAINAGE SUGGEST A PREFERRED DIRECTION OF SURFACE WATER MOVEMENT.
3. "HERRINGBONE" DIVERSION BERMS ARE TO BE USED:
-WHERE THERE IS NO APPARENT PREFERRED DIRECTION OF SURFACE WATER MOVEMENT OR WHERE THE BERM IS LOCATED ACROSS A SLOPE WITH SIDE CUTS ON BOTH SIDES OF THE RIGHT-OF-WAY.
4. ALL BERMS SHALL BE CONSTRUCTED OF SUBSOIL NOMINALLY COMPACTED IN LIFTS. NO ORGANICS, TOPSOIL, SNOW, ICE OR OTHER DELETERIOUS MATERIAL SHALL BE INCORPORATED IN THE BERM FILL.
5. THE LENGTH OF THE BERMS SHALL EXTEND ACROSS THE FULL WIDTH OF THE DISTURBED RIGHT-OF-WAY OR TO THE TOE OF THE CUT SLOPE. BERMS MAY BE EXTENDED BEYOND THE RIGH-OF-WAY BOUNDARIES IF THE LAND APPROVALS HAVE BEEN OBTAINED.
6. TOPSOIL SHALL BE APPLIED TO THE BERMS AFTER COMPACTION OF SUBSOIL.
7. FOLLOWING TOPSOIL REQUIREMENT, THE BERMS SHALL BE SEEDED WITH THE APPROVED MIX, FOLLOWED BY PLACEMENT OF THE BIO-DEGRADABLE EROSION CONTROL FABRIC (BIO4 OR EQUIVALENT). CHECK DAMS AND SILT FENCE MAY BE REQUIRED AFTER PLACEMENT OF THE EROSION CONTROL LINER, AS DETERMINED BY COMPANY'S AUTHORIZED REPRESENTATIVE. THE LINER SHALL BE KEYED-IN. OTHER BIO-DEGRADABLE STAKES/ANCHORS CAN BE USED IN THE PLACE OF WOOD STAKES.
8. THE FINAL LOCATION, SPACING, AND DIRECTION OF THE BERMS ARE TO BE DETERMINED DURING CONSTRUCTION BY THE COMPANY'S AUTHORIZED REPRESENTATIVE BASED ON THE LOCAL TOPOGRAPHY AND DRAINAGE PATTERN.
9. THE FINAL HEIGHT OF THE BERM SHALL BE 0.5m HIGHER ACROSS THE PIPELINE TRENCH IN FROZEN CONDITIONS UNLESS SPECIFIED BY THE COMPANY.
10. SPACING OF DITCH PLUGS SHALL BE EVERY SECOND DIVERSION BERM UNLESS OTHERWISE APPROVED BY THE COMPANIES AUTHORIZED REPRESENTATIVE.

TYPICAL DIVERSION BERM SPACING

SLOPE	SOIL EROSION POTENTIAL		
	HIGH (FINE SANDS AND SILTS)	MODERATE (CLAY AND COURSE SANDS)	LOW (GRAVEL AND EXPOSED BEDROCK)
GENTLE (UNDER 5%)	AS DETERMINED BY COMPANIES AUTHORIZED REPRESENTATIVE	AS DETERMINED BY COMPANIES AUTHORIZED REPRESENTATIVE	AS DETERMINED BY COMPANIES AUTHORIZED REPRESENTATIVE
MODERATE (5%-10%)	30m	60m	90m
STEEP (OVER 10%)	$\frac{305}{\% \text{ GRADE}} = \text{---m}$	$\frac{305 \times 2}{\% \text{ GRADE}} = \text{---m}$	$\frac{305 \times 3}{\% \text{ GRADE}} = \text{---m}$

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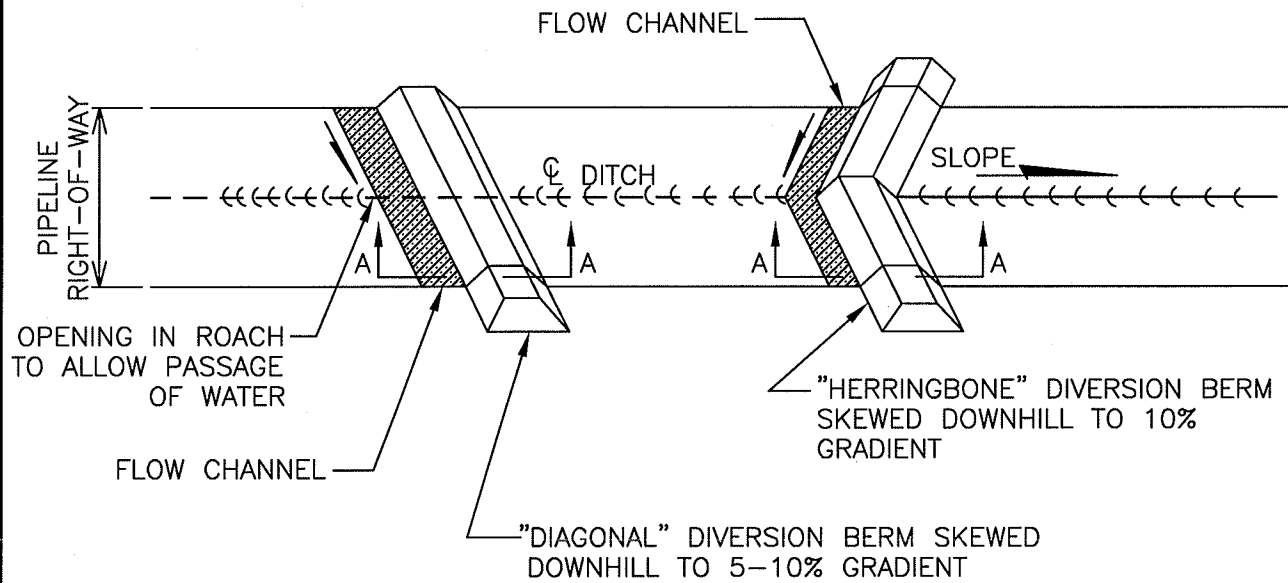


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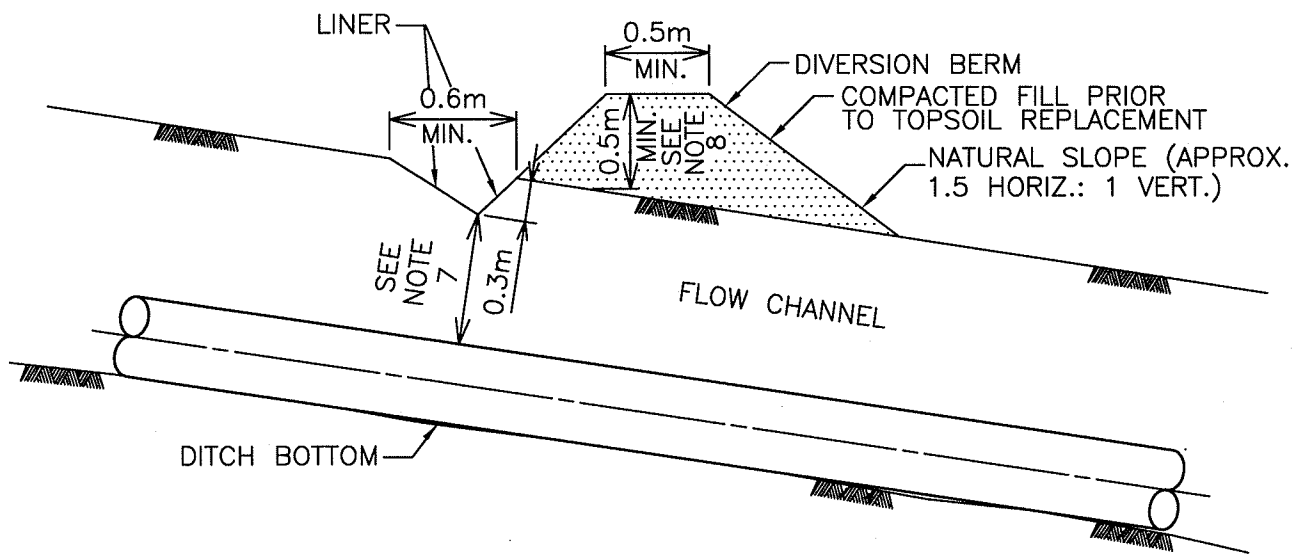
PROFESSIONAL ENGINEER OF ALBERTA
 REG. NO. 10000
 XIXIN LIU

DESIGN STANDARD

FIA #	STDS	CHAINAGE:	DISCIPLINE #	03
TITLE: TYPICAL DIVERSION BERMS (SHT. 02 OF 02)				
SCALE N.T.S.	DWG No	STDS-03-ML-12-221	REV 01	



PLAN



SECTION A-A

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PROFESSIONAL ENGINEER OF ALBERTA

DESIGN STANDARD		DISCIPLINE # 03	
FIA #	STDS	CHAINAGE:	
TITLE: TYPICAL DIVERSION BERMS WITH FLOW CHANNEL (SHT. 01 OF 02)			
SCALE N.T.S.	DWG No	STDS-03-ML-12-222	REV 01

TIME DESIGNFILE

NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. "DIVERSION BERMS WITH FLOW CHANNELS ARE APPROPRIATE TO USE ON STEEP SLOPES. THE LINER SHALL CONSIST OF A BIO-DEGRADABLE EROSION CONTROL FABRIC (MIN. BIO4 OR EQUIVALENT).
3. "DIAGONAL" DIVERSION BERMS ARE USED WHERE THE EXISTING TOPOGRAPHY AND SLOPE DRAINAGE SUGGEST A PREFERRED DIRECTION OF SURFACE WATER MOVEMENT.
4. "HERRINGBONE" DIVERSION BERMS ARE USED WHERE THERE IS NO APPARENT PREFERRED DIRECTION OF SURFACE WATER MOVEMENT ACROSS A SLOPE WITH SIDE CUTS ON BOTH SIDES OF THE RIGHT-OF-WAY.
5. ALL BERMS SHALL BE CONSTRUCTED OF SUBSOIL NOMINALLY COMPACTED IN LIFTS. NO ORGANICS, TOPSOIL, SNOW, ICE OR OTHER DELETERIOUS MATERIAL SHALL BE INCORPORATED IN THE BERM.
6. BERMS SHALL EXTEND ACROSS THE FULL WIDTH OF THE DISTURBED RIGHT-OF-WAY OR TO THE TOE OF THE CUT SLOPE. TO PREVENT WATER FROM FLOWING BACK ONTO THE RIGHT-OF-WAY, THE BERMS SHALL BE EXTENDED A SUITABLE DISTANCE BEYOND THE EDGE OF THE RIGHT-OF-WAY, PROVIDED NECESSARY LAND APPROVALS HAVE BEEN OBTAINED.
7. A FLOW CHANNEL SHALL BE EXCAVATED ALONG THE BASE OF THE UPHILL FACE OF THE DIVERSION BERMS ONLY IF MINIMUM COVER EXIST PRIOR TO EXCAVATION. TYPICAL DIVERSION BERM STDS-03-ML-12-221, INCLUDING THE LINER (KEYED AND SECURED) ON THE UPHILL FACE CAN ALSO BE UTILIZED AS DETERMINED BY THE COMPANY'S AUTHORIZED REPRESENTATIVE. THE LINER SHALL BE SECURED WITH WOOD STAKES OR OTHER BIO-DEGRADABLE STAKES/ANCHORS AT MAXIMUM 1m INTERVALS BETWEEN.
8. TOPSOIL SHALL BE APPLIED TO THE BERMS AFTER COMPACTION OF SUBSOIL.
9. FOLLOWING TOPSOIL REPLACEMENT, THE BERMS SHALL BE SEEDED WITH THE APPROVED MIX, FOLLOWED BY PLACEMENT OF THE BIO-DEGRADABLE EROSION CONTROL LINER (BIO4 OR EQUIVALENT, SECURED AT MAXIMUM 1m INTERVALS). CHECK DAMS AND SILT FENCE MAY BE REQUIRED AFTER PLACEMENT OF THE EROSION CONTROL LINER, AS DETERMINED BY COMPANY'S AUTHORIZED REPRESENTATIVE. THE LINER SHALL BE KEYED-IN.
10. THE FINAL LOCATION, SPACING, AND DIRECTION OF THE BERMS ARE TO BE DETERMINED DURING CONSTRUCTION BY THE COMPANY'S AUTHORIZED REPRESENTATIVE BASED ON THE LOCAL TOPOGRAPHY AND DRAINAGE PATTERN.
11. THE FINAL HEIGHT OF THE BERM SHALL BE 0.5m HIGHER ACROSS THE PIPELINE TRENCH IN FROZEN CONDITIONS UNLESS SPECIFIED BY THE COMPANY.
12. SPACING OF DITCH PLUGS SHALL BE EVERY SECOND DIVERSION BERM UNLESS OTHERWISE APPROVED BY THE COMPANIES AUTHORIZED REPRESENTATIVE.

TYPICAL DIVERSION BERM SPACING

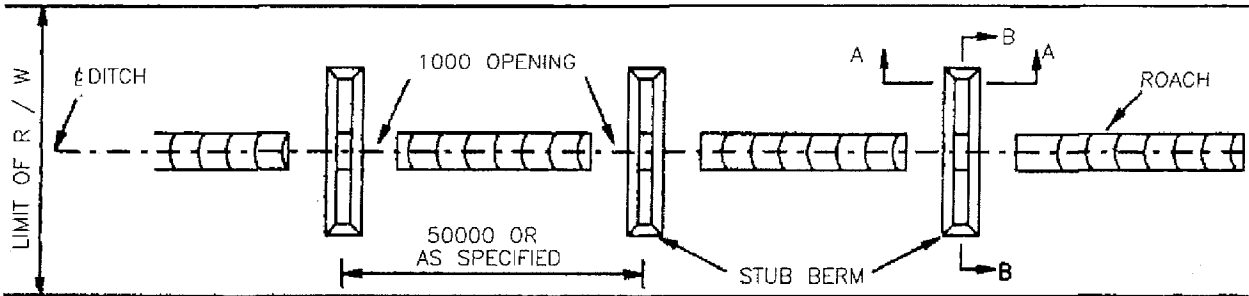
SLOPE	SOIL EROSION POTENTIAL		
	HIGH (FINE SANDS AND SILTS)	MODERATE (CLAY AND COURSE SANDS)	LOW (GRAVEL AND EXPOSED BEDROCK)
GENTLE (UNDER 5%)	AS DETERMINED BY COMPANIES AUTHORIZED REPRESENTATIVE	AS DETERMINED BY COMPANIES AUTHORIZED REPRESENTATIVE	AS DETERMINED BY COMPANIES AUTHORIZED REPRESENTATIVE
MODERATE (5%-10%)	30m	60m	90m
STEEP (OVER 10%)	$\frac{305}{\% \text{ GRADE}} = \text{---m}$	$\frac{305 \times 2}{\% \text{ GRADE}} = \text{---m}$	$\frac{305 \times 3}{\% \text{ GRADE}} = \text{---m}$

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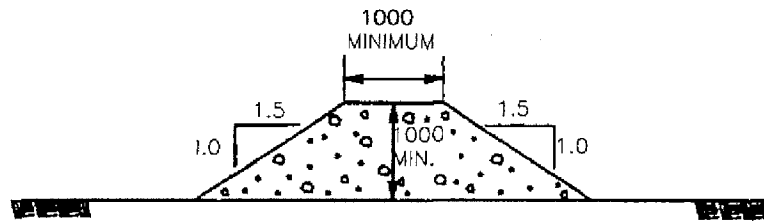


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 XIXIN LIU
 NAME: XIXIN LIU DATE: 2015/08/20
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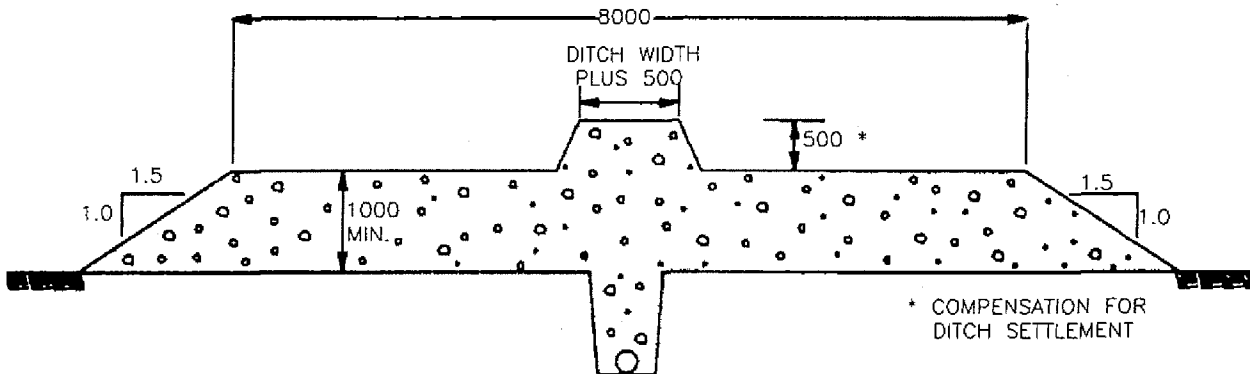
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FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE: TYPICAL DIVERSION BERMS WITH FLOW CHANNEL (SHT. 02 OF 02)			
SCALE N.T.S.	DWG No	STDS-03-ML-12-222	REV 01



PLAN (NTS)



SECTION A
NTS



SECTION B
NTS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. STUB BERMS SHALL CONSIST OF NATIVE MINERAL SOIL NOMINALLY COMPACTED IN 300mm LIFTS USING HEAVY CONSTRUCTION EQUIPMENT. ORGANICS, SNOW, ICE, OR OTHER DELETERIOUS MATERIAL SHALL NOT BE INCORPORATED IN THE BERM FILL.
3. STUB BERMS SHALL BE PLACED PERPENDICULAR TO THE PIPE CENTERLINE.
4. AREAS OF APPLICATION FOR STUB BERMS: STUB BERMS ARE USED FOR THE CONTROL OF SURFACE FLOWS ALONG PIPELINE RIGHT-OF-WAY IN LOW LAYING SWAMPY TERRAIN.
5. THE FINAL LOCATION AND SPACING OF THE STUB BERMS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BY THE COMPANY'S AUTHORIZED REPRESENTATIVE.
6. SYNTHETIC COILS MAY BE USED IN PLACE OF STUB BERMS.

01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC

00 THIS DRAWING SUPERCEDES SK-1554

REVISIONS



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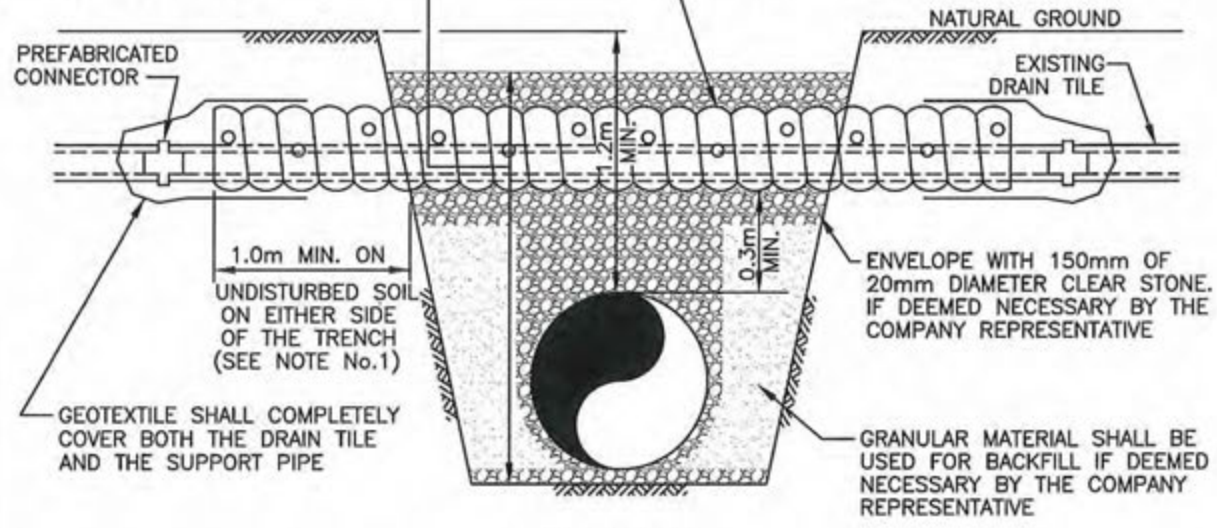
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FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE TYPICAL STUB BERM			
SCALE N.T.S.	DWG No	STDS-03-ML-12-223	REV 01

REVISIONS 00 STANDARD ISSUE, SUPERCEDES ASK-18-85 01 GENERAL ISSUE - REVIEWED FOR 2015 SPEC 02 GENERAL ISSUE - REVIEWED FOR 2016 SPEC

TUBING SIZE	CORRUGATED PIPE SIZE (SEE NOTE 7)
102mm	152mm
153mm	203mm
203mm	254mm
254mm	305mm
305mm	381mm
406mm	457mm

PERFORATED, 16 GAUGE GALVANIZED CORRUGATED STEEL PIPE OR HIGH DENSITY POLYETHYLENE PIPE SUPPORT

BACKFILL SHALL BE COMPACTED IN 150mm LAYERS BENEATH AND AROUND SUPPORT PIPE



SECTION
N.T.S.

NOTES

- IF THE WIDTH OF THE TRENCH DOES NOT ALLOW FOR THE INSTALLATION OF THE SUPPORT PIPE ON A MINIMUM OF 1.0m OF UNDISTURBED SOIL, ONE OF THE FOLLOWING MITIGATION MEASURES SHALL BE ADHERED TO AS DIRECTED BY THE COMPANY REPRESENTATIVE.
 - RELOCATE THE DRAIN TILE CROSSING TO A LOCATION THAT WOULD ACCOMMODATE THE CROSSING OF THE DITCH AS OUTLINED ABOVE PROVIDED THAT INTENDED DIRECTION OF FLOW WERE RESPECTED
 - BUILD UP THE BEARING SURFACE WITH GRANULAR MATERIAL WHICH MUST BE SUFFICIENTLY COMPACTED TO ALLOW FOR THE PROPER INSTALLATION OF THE SUPPORT PIPE.
 - ALL OTHER METHODS APPROVED BY THE COMPANY REPRESENTATIVE.
- SUPPORT PIPE AND DRAINAGE TUBING SHALL BE OF QUALITY AT LEAST EQUAL TO CANADIAN GOVERNMENT SPECIFICATION BOARD STANDARD 41G.P.29 AND QUEBEC STANDARDS NQ 3624-115 AND NQ 3624-120.
- ALL MATERIAL REQUIRED TO COMPLETE THE WORK AND RESTORE THE SITE SHALL BE SUPPLIED BY THE CONTRACTOR.
- SUPPORT PIPE AND PLASTIC DRAINAGE TUBING TO BE INSTALLED SO THAT THE HOLES ARE CENTERED ON EACH SIDE OF THE PIPE.
- DRAIN TILE SHALL BE RESTORED AS PER THIS DRAWING OR AS DIRECTED BY THE COMPANY.
- IN GENERAL, AT DRAIN TILE CROSSING, A MINIMUM OF 8 METRES OF PLASTIC DRAIN TILE AND 6m OF SUPPORT PIPE WILL BE REQUIRED.
- THE NOMINAL SIZE MAY VARY DEPENDING ON THE TYPE OF SUPPORT PIPE UTILIZED.



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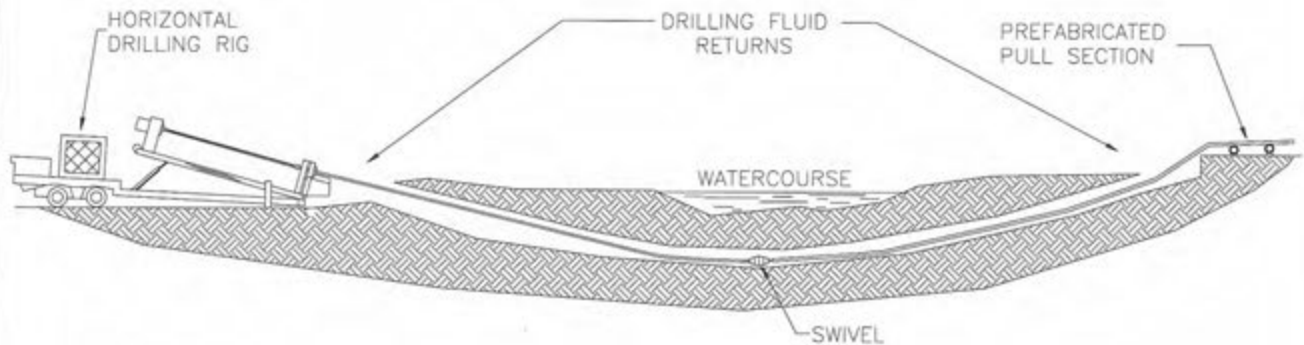
PROFESSIONAL ENGINEER OF ALBERTA

TITLE: DRAIN TILE RESTORATION

SCALE: N.T.S.

DWG No: STDS-03-ML-03-214

REV 02



PLAN VIEW
NTS

NOTES

1. OBTAIN GEOTECHNICAL DATA PRIOR TO INITIATING DRILLING. DRILLING MAY NOT BE FEASIBLE IN SOME MATERIAL SUCH AS UNCONSOLIDATED GRAVEL.
2. ENSURE TEMPORARY WORKSPACE RIGHTS HAVE BEEN OBTAINED TO CONDUCT MONITORING AND THAT ACCESS IS AVAILABLE FOR MONITORING ACTIVITIES.
3. SET UP DRILLING EQUIPMENT BACK FROM THE EDGE OF THE WATERCOURSE; DO NOT CLEAR OR GRADE WITHIN THE BUFFER ZONE.
4. EMPLOY FULL TIME INSPECTORS OR MONITORS TO OBSERVE FOR ANY INADVERTENT MUD RELEASE INTO THE WATERCOURSE.
5. ENSURE THAT ONLY BENTONITE BASED DRILLING MUD IS USED. ALL BENTONITE BASED SYSTEMS SHALL MEET APPLICABLE REGULATORY REQUIREMENTS AND THE COMPANY SHALL APPROVE ALL ADDITIVES AND CONCENTRATIONS PRIOR TO USE.
6. INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE,
7. INSTALL SUMPS AND BERMS, OR EQUIVALENT BARRIERS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
8. DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.
9. PREPARE A DRILLING MUD RELEASE CONTINGENCY PLAN.

Source: Adapted from Fisheries and Oceans Canada 2005, Pipeline Associated Watercourse Crossing, 3rd addition

ISSUED FOR APPLICATION

DESIGNFILE



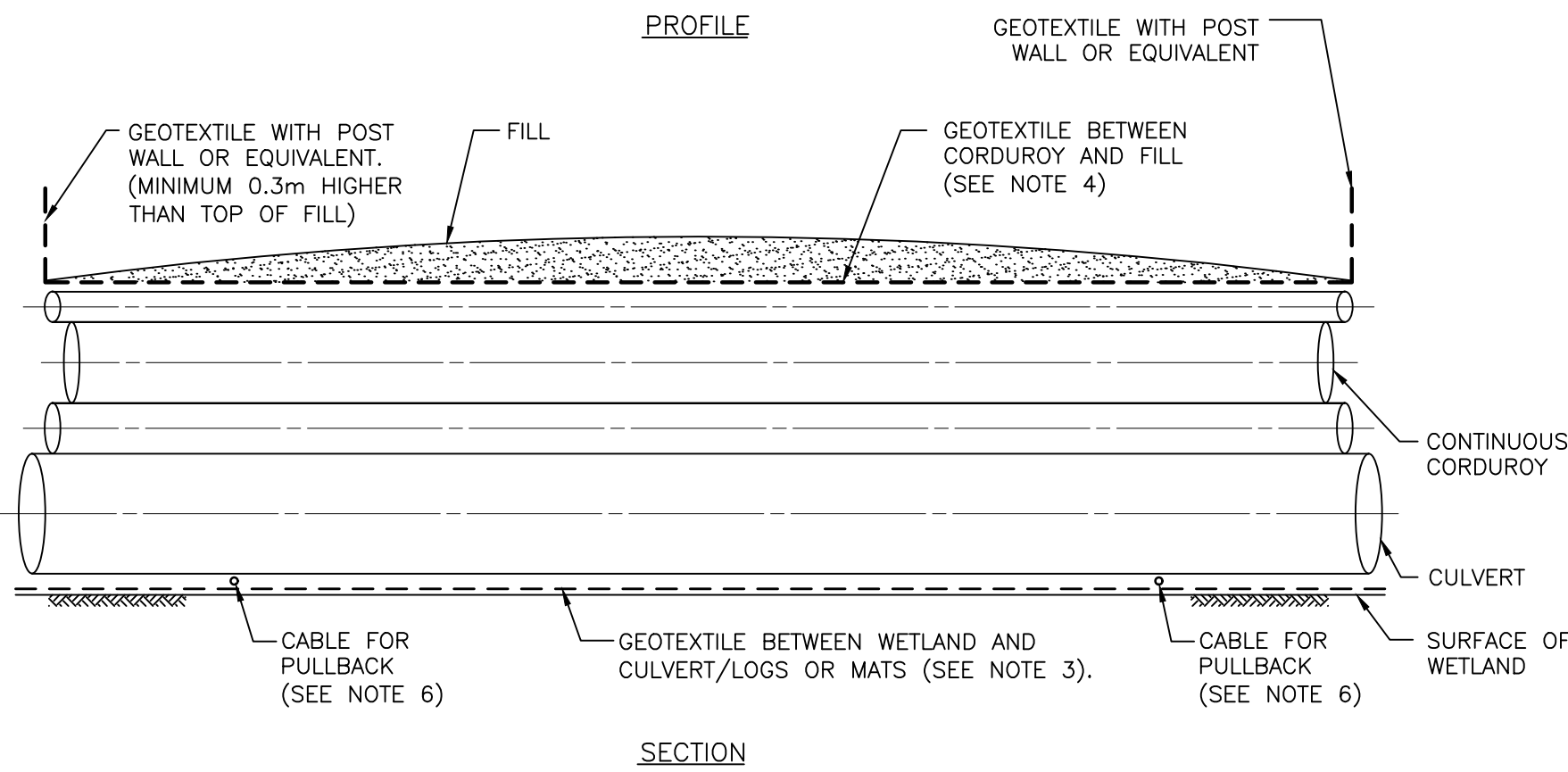
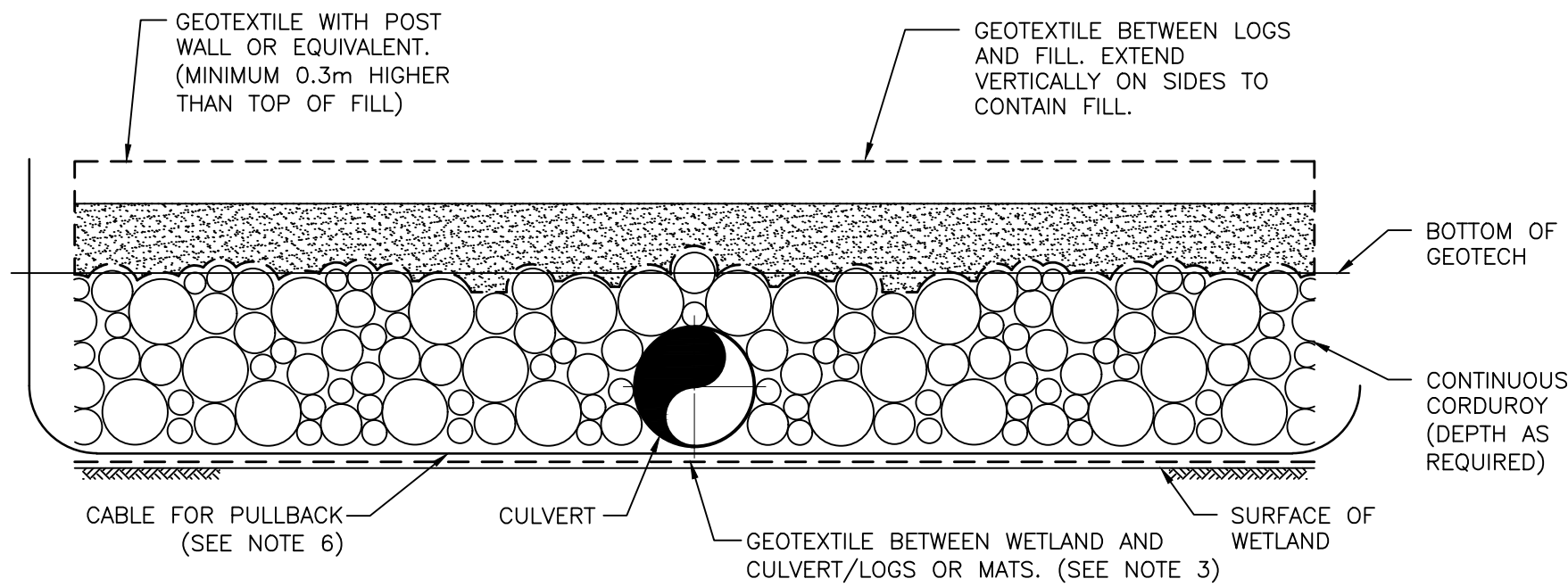
DESIGNER:

 NAME
 DATE: 12-04-2017

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DESIGN STANDARD			
FIA #	STDS	CHAINAGE:	DISCIPLINE # 03
TITLE			
TYPICAL HORIZONTAL DIRECTIONAL DRILL			
SCALE NTS	DWG No	STDS-03-LA-SK-001	REV 00



CONSTRUCTION NOTES:

1. CORDUROY (MINIMUM LOG DIAMETER OF 15cm) OR ACCESS MATS CAN BE USED ALONE, OR IN COMBINATION; LAYER CORDUROY AND ACCESS MATS AS REQUIRED VERTICALLY. ALTERNATING SECTIONS OF CORDUROY AND ACCESS MATS CAN BE USED AS REQUIRED AS WETLAND CONDITIONS AND TYPES CHANGE. CORDUROY MUST BE TRIMMED OF ALL LIMBS, TOPS AND STUMPS PRIOR TO PLACEMENT.
2. WHERE CULVERTS ARE REQUIRED, SIZE TO SUIT WETLAND HYDROLOGY (I.E. DO NOT CONSTRAIN OR BACKUP WATER ON EITHER SIDE) AND ANTICIPATED FLOWS FOR DURATION CROSSING WILL BE IN PLACE. SPACE CULVERTS AMONGST CORDUROY, OR UNDER ACCESS MATS, AT EQUAL INTERVALS, AND/OR AT LOCATIONS WHERE FLOW IS ANTICIPATED/OBSERVED.
3. GEOTEXTILE FABRIC (ENVIRO-PRO EP-1050 OR EQUIVALENT, UNLESS OTHERWISE APPROVED BY THE COMPANY) WILL BE PLACED ON THE WETLAND SURFACE PRIOR TO CORDUROY OR ACCESS MAT PLACEMENT TO INCREASE STABILITY AND ASSIST IN REMOVAL. ENSURE GEOTEXTILE IS APPROXIMATELY 1M WIDER THAN CORDUROY/ACCESS MATS. CULVERT CAN BE EMBEDDED AND PLACED BELOW GEOTEXTILE WHERE NECESSARY.
4. IF FILL MATERIAL IS TO BE PLACED ON TOP OF CORDUROY/ACCESS MATS. GEOTEXTILE FABRIC (ENVIRO-PRO EP-1050, OR EQUIVALENT) WILL BE PLACED BETWEEN THE CORDUROY/ACCESS MATS AND ANY FILL MATERIAL. WHERE FILL IS REQUIRED, ENSURE GEOTEXTILE LAYER IS SUFFICIENTLY WIDE ENOUGH, EXTENDED AND SECURED VERTICALLY TO POSTS CREATING A WALL A MINIMUM OF 0.3m HIGHER THAN THE TOP OF FILL. (SEE SECTION VIEW)
5. CROSSING WILL REMAIN IN PLACE AS REQUIRED; CROSSING MATERIAL SHALL BE MAINTAINED, REPAIRED AS NECESSARY AND IN GOOD CONDITION TO ENSURE THEY ARE WORKING AS INTENDED UNTIL COMPLETION AND REMOVAL.
6. WHERE NECESSARY, CABLES MAY BE PLACED UNDER LOGS TO ASSIST WITH REMOVAL (E.G. AT LOCATIONS WHERE SEASONAL HIGH FLOWS MAY REQUIRE PULLBACK OF SOME LOGS TO ACCOMMODATED FLOWS).
7. UPON COMPLETION OF THE WORK, ALL MATERIALS SHALL BE REMOVED AND DISPOSED OF AT APPROVED LOCATIONS. FILL USED FROM ROW GRADE CUTS OR OTHER BORROW AREAS SHALL BE REPLACED IN THE ORIGINAL LOCATION AND CONTOURS UNLESS OTHERWISE APPROVED BY THE COMPANY. MATS THAT CANNOT BE RE-USED SHALL BE DISPOSED AT AN APPROVED LOCATION. CORDUROY SHALL BE UTILIZED AS ROLLBACK FOR ACCESS CONTROL OR EROSION CONTROL IN LOCATION APPROVED BY THE COMPANY. CORDUROY SHALL NOT BE BURNED UNLESS APPROVED BY THE COMPANY.
8. APPLICATION OF CORDUROY AND/OR MATTING WILL BE APPROVED BY THE COMPANY.

REFERENCE DRAWINGS	
DRAWING No	TITLE
-	

REV No	DATE	REVISION	PROJECT CODE	DRAFT BY	DRAFT CHK	DESIGN BY	DESIGN CHK	PROJ MGR
00	2022-04-19	BASE DRAWING ISSUED FOR USE	-	DJ	BD	WP	JH	

PROFESSIONAL ENGINEER/RPT	PERMIT/ ENG. APPROVAL
_____	_____
	DATE
REV. NO.	DATE
	PERMIT NUMBER:

TC Energy

PIPELINE FACILITIES BASE DRAWINGS - CANADA

FACILITY # PBAS ENG STN: DISC # 03

TYPICAL CORDUROY/MAT WETLAND CROSSING

SCALE N.T.S. DRAWING # PBAS-03-ML-05-001 REV 00

APPENDIX 1E
CONTINGENCY PLANS

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1.0 RELEASE CONTINGENCY PLAN

Introduction

During construction, an accidental release incident (i.e. spill) has the potential to occur. The majority of releases on a construction project are categorized as small or low impact releases (spot spill). Depending upon the location, substance and quantity of the release, the release incident may be reportable to applicable federal and/or provincial authorities. The following contingency plan identifies the appropriate measures required to be employed.

If an accidental release does occur, measures to control, contain, recover and clean up the release are to be implemented in a timely manner to minimize the potential for adverse environmental and human health effects. The effective containment of a release onto land or into a waterbody or watercourse depends on a variety of factors including: the composition of the release material, duration and extent of the release in addition to ground cover, topography, hydrogeology, solubility of the material, viscosity of the liquid, water currents, soil permeability, climatic, seasonal and local weather conditions of the release site.

If a Contractor specific Release Response Plan (or equivalent) is required, the plan will be reviewed by a Company Representative to ensure that the Contractor Release Response Plan is in alignment and meets the requirements of the Company's Release Contingency Plan.

General Environmental Protection Measures

The following general environmental protection measures are to be adhered to during all phases of construction:

1. Appropriate release containment (spill kits) and recovery equipment and materials will be maintained at all work sites, in accordance with the Chemical and Waste Management Plan (Appendix 1F).
2. Specific instructions regarding applicable notifications and appropriate response actions to be taken in the event of a release will be included in project orientations.
3. The first person on the scene will take immediate action to control the scene as identified in the Company reviewed Contractor Release Response Plan (or equivalent) or the Company's Release Contingency Plan.
4. Ensure the release is reported to the Environmental Inspector(s) or designate(s).
5. The Release Report Form (below) or other equivalent form shall be used to document the details of the release. Do not wait for all the details to fill-in and provide the form to the Company.
6. When notified of a release of any type, a Company Representative will:
 - determine if the release is reportable as per applicable provincial and/or federal regulations;
 - refer to the Emergency Contacts list for the appropriate reporting information (Appendix 1A);
 - notify the appropriate responsible provincial regulator if the release incident is reportable as soon as practicable and within 24 hours of detection.
 - In the event of a significant, or potentially significant, adverse effect on the environment, or other immediately reportable event as defined under the Canada Energy Regulator (CER) Event Reporting Guidelines, the Company's Regulatory Compliance team will determine federal reportability and notify the CER within 3 hours of the incident being discovered.
 - Such incidents include, but are not limited to: "frac outs" released into a watercourse during an HDD; the release of a toxic substance into a sensitive environment (e.g., watercourse, wetland) or into a designated national/provincial area (e.g., national park, provincial park, wildlife refuge), or in an area where there is a pathway to a receptor nearby (e.g., where groundwater or surface water is used for drinking, irrigation, or is consumed by livestock); or, the destruction of critical habitat for SARA-listed species.

7. The Environmental Planner or designate will document the incident in the TC Energy EHSM Incident Management system within 24 hours of the incident.
8. Where applicable, prepare a detailed reclamation plan and follow-up reports that may be required by regulations or information request.

Hazardous Materials Emergency Response Measures

The following actions will be taken upon initial detection of a hazardous materials release:

1. The first person on the scene will take immediate action to control the scene as identified in the Contractor Release Response Plan and will notify both the Contractor and a Company Representative of the nature of the release incident;
2. When notified of a hazardous materials release, the Contractor will immediately ensure that:
 - action is taken to control potential danger to human life including the appointment of an Onsite Safety Supervisor;
 - the necessary equipment is mobilized and measures are implemented immediately to control and contain the release; and
 - all resources are made available to contain and safely recover the release.

Containment, Recovery and Cleanup

At a minimum, the following general measures are to be followed to contain, recover and clean up low impact spot releases onto the Project footprint from construction equipment or similar sources:

1. Assess the safety hazards of the situation;
2. Pump out any material remaining within the source of the release, if applicable;
3. Remove sources of ignition, if safe to do so;
4. Identify the product, stop source, and physically contain release as soon as is safe to do so;
5. Take immediate steps to contain and clean up the release to minimize potential for the release to spread or increase in size;
6. Delineate and clearly flag the entire release and containment area and avoid equipment traffic and ground disturbance activities in the area until clean-up is complete;
7. Avoid use of water or fire extinguishing chemicals on non-petroleum product spills unless it is necessary to control a fire or prevent an explosion, since many chemicals react violently with water and chemical extinguishing agents may release toxic fumes. In addition, chemicals may be soluble in water and dispersal makes containment and clean-up more difficult;
8. Use natural depressions or berms constructed with available materials in proximity to the site to physically contain a release onto land;
9. Determine clean-up options and appropriate methods to recover and dispose of potentially contaminated soil or vegetation at an approved facility;
10. Recover the released materials from the defined containment area using equipment suitable to the nature and extent of the release;
11. Cleanup the release and containment areas. Consultation with a qualified remediation specialist and/or Company Representative may be required; and
12. Dispose of containment materials, and contaminated soil and vegetation at an approved facility.

Releases Adjacent to or into a Watercourse or Waterbody

At a minimum, the following general measures are to be implemented to recover and remediate an accidental release adjacent to, or into, a watercourse or waterbody.

1. Recover the released materials from the containment area using equipment suitable to the nature and extent of the release;
2. Deploy booms, skimmers, sorbent pads or a functionally equivalent containment structure to contain releases in or near a watercourse or waterbody;
3. Recover spilled product;
4. Cleanup the release and containment areas. Consult with a qualified remediation specialist and/or Company Representative, where required; and
5. Dispose of containment materials, and contaminated soil, vegetation and water at an approved facility.

RELEASE REPORT FORM

Type of Material Released:

Gasoline _____
Diesel _____
Lube Oil _____
Hydraulic Fluid _____
Vehicle Antifreeze _____
Other (specify) _____

Date and Time of Release or Discovery: _____

Source of Release: _____

Area of Release (m²): _____

Depth of Release (cm): _____

Volume of Release (L): _____

Estimated Release Rate: _____

Duration of Release: _____

Location (land, water, land and water): _____

Soil Type (e.g., sandy, clay, etc.): _____

Location: Easting _____; Northing _____ UTM Zone ____; KP _____

Land Use: _____

Environmentally sensitive areas potentially affected: _____

Weather conditions at time of discovery: _____

Procedures taken to minimize, control or stop the release: _____

Remediation plan and schedule of implementation, if required: _____

Current status of the remediation program: _____

(dd/mm/yy) (hr:min): _____

Form Completed by:

Name: _____ (printed) _____ (signed)

Date: _____

2.0 ADVERSE WEATHER CONTINGENCY PLAN

The Environmental Inspector(s) or designate(s) are responsible for monitoring and implementing all procedures and will liaise with the responsible regulators, when required. If necessary, a meeting will be held in the field to ensure that all involved parties mutually understand concerns.

Where adverse weather conditions and activities have the potential to cause adverse environmental effects, the Environmental Inspector(s) or designate(s) will suspend that phase of the operation until weather conditions abate or effective mitigation procedures have been implemented. The following represents mitigation measures that may be applied. Specific environmental mitigation is subjective and dependent upon construction footprint conditions and the Project schedule.

The following table outlines mitigation measures that allow for the continuation of activities and reduce potential adverse environmental effects.

WIND EROSION	
Mitigation Options to Consider	
1	Uniformly apply mulch or tackifier to topsoil/strippings piles and/or other areas affected by wind erosion.
2	Water identified areas when activities or sufficient winds have created the potential for topsoil/strippings erosion.
3	Apply straw to topsoil/strippings and/or other areas where winds have created the potential for soil erosion. Straw sources are subject to landowner or regulatory approval, and must be approved by the Environmental Inspector(s) or designate(s). When clean straw is unavailable, seeding a clean, unpalatable annual crop at half the normal rate is acceptable.
WATER EROSION	
Temporary Berms / Silt Fence	
1	Temporary berms, silt fence and/or other appropriate mitigation measures (e.g., wattles, erosion control matting) will be implemented along the trench crown, surface material piles, and/or other areas where the potential for water erosion has been identified.
2	To prevent ponding and/or erosion, cross right-of-way drainage will be maintained. Appropriate measures (e.g., sumps, pumping excess water) to prevent deleterious material from entering a watercourse or waterbody will be implemented, when and where required.
Construction Footprint Maintenance / Stabilization	
1	During adverse weather conditions, the Company will direct the Contractor to reduce unnecessary traffic and the number of vehicles on the construction footprint. Better planning of activities will be required by the Contractor to either tighten up, or spread out the work crews as warranted (e.g., close proximity of ditching, lower in, and backfill operations). To reduce effects, a one trip in, one trip out philosophy will be implemented for all construction footprint access.
2	Traffic will be restricted to the construction footprint. The responsible regulator will need to approve any activities outside of the construction footprint.
3	The traffic pattern on the construction footprint will be changed to avoid repeated driving in the same areas.
4	Under adverse weather conditions, the Contractor will be required to back-blade the construction footprint during and at the end of the day. Back-blading of the construction footprint fills in tire tracks, thereby assisting in the prevention of water erosion and re-establishing a firm working surface.
5	Under adverse weather conditions, topsoil/surface material and/or subsoil may be stripped and placed at the edge of the construction footprint if approved by the Environmental Inspector(s) or designate(s). Topsoil, surface material and/or subsoil will be redistributed evenly across the construction footprint during clean-up.
6	Under spring thaw condition and/or where identified by the Company, and in consultation with the responsible regulator, vehicle watercourse crossing techniques may be modified and/or replaced with other appropriate crossing techniques.
7	When available and practicable, tracked equipment may be required for specific activities.
8	Work in highly sensitive areas may be stopped and shifted to less sensitive areas.
9	If all mitigation fails, Project activities may be suspended until adverse weather conditions abate, thereby incurring a schedule delay. Project shut-down will be based upon discussions between the Construction Manager, Contractor, Environmental Planner and the Project Management Team. Recommencement of work must be authorized by the Construction Manager, in consultation with the Environmental Inspector(s) or designate(s) prior to restart.

3.0 FLOOD AND EXCESSIVE FLOW CONTINGENCY PLAN

The weather conditions will be monitored by the Environmental Inspector(s) or designate(s) on a daily basis. If a major storm is predicted or occurs, qualified personnel will inspect all watercourse crossings where construction is in progress or has been completed, to determine whether any corrective actions need to be implemented.

At watercourses where an isolated crossing method is recommended, the proposed isolation crossing techniques may not be feasible during periods of excessive flow or unusually wet seasons.

The following contingency measures will be implemented progressively or individually, as warranted, if excessive flow or flood conditions are anticipated prior to commencing watercourse crossing construction.

1. Assess the capability to handle the expected flow rate with the proposed crossing method. If use of the proposed crossing method is determined to be feasible by the Company, the crossing will proceed.
2. Defer water crossing construction to a later time when flows have subsided, if it is determined by the Company that the proposed crossing method is not feasible.
3. Alternatively, where the expected flow rates and window limitations combine to preclude the proposed crossing method, request approval from the responsible regulators to use an alternate crossing method.

The following contingency measures will be implemented progressively or individually, as warranted, if excessive flow or flood conditions should occur during watercourse crossing construction.

1. Assess the capability to handle the anticipated flow rate with the proposed crossing method. If use of the proposed crossing method is determined to be feasible by the Company, the crossing will proceed.
2. Increase the quantity of materials required to perform the crossing. Reinforce or replace the isolation and/or bypass structure(s) if necessary.
3. Withdraw all equipment or tanks containing fuel, oil or other hazardous materials from potential flood areas.
4. Remove all stationary and mobile equipment deployed at the crossing site to a safe area above the anticipated high water level.
5. Remove any instream flume or dam equipment that may impede streamflow, as safe work conditions allow.
6. Relocate all topsoil/strippings piles at the direction of the Environmental Inspector(s) or designate(s).
7. Relocate spoil piles, to the extent feasible, to a position above the anticipated high water level.
8. Evaluate vehicle crossing structure to determine whether adequate free-board is present on bridges and adequate capacity is available in culverts. Take corrective measures as appropriate to avoid flooding of adjacent lands.
9. Import sandbags and place strategically to help stabilize and add height to banks to prevent flooding of nearby areas, especially where vegetation has been removed.

4.0 WET SOILS CONTINGENCY PLAN

The Company will assign Environmental Inspector(s) or designate(s) with sufficient training and soils-related experience to be able to identify soils that are too wet for a particular activity and when the soils are sufficiently dry or frozen to allow the activity to resume. The decision to continue or suspend particular construction activities on lands with excessively wet soils will be made by the Construction Manager in consultation with the Environmental Inspector(s) or designate(s).

Soils are considered to be excessively wet when the planned activity could cause unacceptable damage to soils either due to rutting by traffic through the surface layer into the subsoil; soil structure damage during soil handling; or compaction and associated pulverization of surface material due to heavy traffic.

In order to minimize terrain disturbance and soil structure damage through rutting or compaction due to wet soil conditions, construction alternatives will be employed, as necessary, in the event of excessively wet soils. The contingency measures listed below will be implemented individually or in combination, as necessary, based on site-specific conditions.

Wet Soil Contingency Measures

1. Restrict construction traffic, where feasible, to equipment with low-ground-pressure tires or wide pad tracks.
2. Postpone construction until evening or early morning when the ground is frozen.
3. Install rig mats, swamp mats, access mats or equivalent, or corduroy, or geotextile and fill (excluding topsoil or other surface materials), as approved by the Company, in areas of wet soils to reduce terrain disturbance and soil structure damage.
4. Under frozen conditions, employ frost inducement measures such as snow packing or plowing to delay premature thawing.
5. Suspend timber skidding operations or implement other measures (*e.g.*, use tarps or plastic sheeting) if the potential exists for salvageable timber to be damaged through contact with wet soils.
6. Suspend construction until soils dry out or freeze.

5.0 FIRE SUPPRESSION CONTINGENCY PLAN

5.1 Fire Suppression Supplies and Personnel

Necessary fire-fighting equipment will be on site in accordance with the requirements of the responsible regulator. In addition, all motorized equipment must carry a fully charged fire extinguisher. The Contractor will ensure that fire extinguishers are present and fully charged and all fireline equipment is present and in working order. The fire equipment and water supply on site should be increased as the fire hazard increases.

5.2 In the Event of a Fire

The following mitigation measures will be implemented in the event of a fire.

1. Commence fire suppression measures immediately upon detection of fire provided that fire conditions allow personnel to safely proceed under the direction of the Contractor.
2. Personnel working on the Project must report the location of fire as well as size of fire and wind direction, to the Contractor immediately.
3. The Contractor, or Company designate, will report wildfires and relevant information to the Company's Environmental Planner, Construction Manager. The Contractor will supply necessary information for the Company designate to report wildfires to the responsible regulator, municipal By-Law officers and applicable local fire departments. Reporting to provincial authorities must be completed immediately. Refer to the Fire Report Form for guidance when reporting fires to regulator.
4. The Contractor will deploy fire-fighting equipment and crew to clear fire breaks or extinguish the fire directly if possible. All equipment and personnel shall be made available to control the fire. Effort of fire control will be limited, if warranted, due to safety issues and will take into consideration fire conditions, safety, fitness of personnel and equipment availability.
5. The Contractor will inspect the fire site as soon as possible and take charge of directing suppression measures until relieved of this duty by the applicable provincial authority or until conditions become unsafe.
6. The Contractor will deploy additional crew and machinery as needed and the Company will request assistance of the responsible regulator, local fire department and applicable municipal government if Contractor resources are inadequate (see contact list and phone numbers below). Fire suppression measures shall continue until the fire is extinguished or until otherwise notified by the responsible regulator.
7. Moveable material, particularly explosive or flammable materials, vehicles, etc. will be promptly moved to a safe location whenever there is a possibility of being endangered by fire.
8. The Contractor will ensure that all burning embers are extinguished and will monitor burn area for smouldering material. Employ infrared scanning equipment to detect any hot spots.
9. Refer to Appendix 1A of the EPP for emergency fire reporting numbers.

FIRE REPORT FORM

General

Date and Time of Fire or Discovery: _____

Source (if known): _____

Location of Fire

LSD _____ of section _____ Township _____ Range _____ W _____ Mer.

Easting _____; Northing _____ UTM Zone _____; KP _____

Other description of location:

Site Information

Fire is burning in the:

ground _____

bush (timber type) _____

agricultural land _____

Other _____

Rate of spread is:

not moving _____

moderate (less than a normal walk?) _____

fast (more than a normal walk?) _____

Any people at the fire? Yes _____ No _____ Don't know _____

Is property threatened? Yes _____ No _____ Don't know _____

Is road access available? Yes _____ No _____ Don't know _____

Is water readily available? Yes _____ No _____ Don't know _____

Any other observations? _____

(e.g., lightning, recreation, vehicles)

Smoke Information

When unable to see fire, only smoke visible:

Colour: light grey _____ Column: intermittent _____

medium grey _____ scattered _____

dark grey _____ light _____

black _____ heavy _____

6.0 SOIL HANDLING CONTINGENCY PLAN

While soils handling criteria presented in this EPP address the key soils handling questions that could occur during construction, the following minor problems may arise during construction that may result in loss of soil capability if not addressed. Mitigation measures are provided to lessen the potential impacts associated with construction in agricultural land use.

Condition/Concern	Mitigation Options
<i>Little or no topsoil on cultivated, pasture or hay lands</i>	1. Follow direction provided in the Soil Survey as provided on the Environmental Alignment Sheets.
<i>Poor colour separation between topsoil/strippings and subsoils</i>	2. Identify subsoil by texture and structure for any site-specific adjustments to depth. 3. Use topsoil/strippings depths indicated in the soil assessment and the Environmental Alignment Sheets as a guide.
<i>Stony subsoils or topsoil/strippings</i>	4. Attempt to use conventional equipment to strip topsoil/strippings. 5. Employ backhoe, if above measures are ineffective. 6. Pick rocks after backfilling and after grade restoration. 7. Pick rocks after replacement of topsoil/strippings.
<i>Shallow bedrock</i>	8. Ripping is preferred over blasting where rock trenching is encountered. 9. Bedrock is not to be backfilled into the upper 0.5 m of the trench on agricultural lands. 10. Excess bedrock will be disposed of at locations approved by the Company and responsible regulator, where applicable. 11. Import additional or replacement backfill if warranted from locations approved by the Company, and responsible regulator, where applicable.
<i>Alternate soil handling measure or no topsoil/upper surface material stripping requested by landowner</i>	12. Discuss benefits of proposed soil handling with landowner. 13. If the landowner maintains the request following discussions, conduct topsoil/strippings handling operations in compliance with the landowner's request.
<i>Uneven interface between topsoil/strippings and subsoil</i>	14. Utilize equipment capable of fine depth adjustments when salvaging topsoil/strippings.
<i>Soil pulverization</i>	15. Minimize traffic on the construction footprint. 16. Where pulverization of soils has the potential of causing soil loss or long-term structural impact, salvage topsoil/strippings, regrade and/or stabilize the construction footprint using a tackifier or water, as specified by the Environmental Inspector(s) or designate(s).
<i>High winds</i>	17. Suspend topsoil/strippings handling during high wind conditions.
<i>Frozen Ground Conditions</i>	18. If frozen ground conditions become permanent and standard non-frozen construction procedures can no longer be achieved without affecting soil quality and land capability, then frozen ground stripping procedures will be fully employed.

7.0 PERMAFROST CONTINGENCY PLAN

Permafrost tends to be confined to poorly-drained organic bogs where the thick layers of peat provide insulating properties to protect the permafrost from thawing.

In the unlikely event that isolated pockets of permafrost are identified throughout the Project during construction, the following mitigation measures will be implemented to the extent practicable.

1. NGTL will inform the CER Compliance Inspector with a report identifying and describing each permafrost location encountered at the site. The report will include the depth, extent, terrain, vegetation and mitigation measures implemented.
2. NGTL will attempt to adjust the location of permanent facilities (fenced area and access road) to avoid direct impact to areas of permafrost, if feasible.
3. Construction schedule will allow site preparation in frozen conditions only, in areas where permafrost may be encountered.
4. Snow and ice will be used to create a level surface to facilitate construction at the site. Grubbing and grading over the area of permafrost will be avoided, if feasible.
5. Any strippings or subsoil will be placed on a snow layer in the permafrost area to prevent damage to the upper surface materials over the permafrost.

8.0 SOIL EROSION CONTINGENCY PLAN

If wind or water erosion is evident during the construction phase of the Project, all necessary Contractor equipment and personnel will be made available to control the erosion. During the construction phase, the Environmental Inspector(s) or designate(s) in consultation with the Company's Environmental Planner will determine appropriate procedures to be implemented to control soil erosion and other soil handling problems encountered.

This table provides a list of control options to be implemented as appropriate. Similar procedures should be followed during the operational phase.

Concern	Mitigation Options
<i>Water Erosion</i>	<ol style="list-style-type: none"> 1. Implement one or a combination of the following mitigation techniques: <ul style="list-style-type: none"> • install silt fences near the base of slopes; • regrade furrows and gullies; • construct cross ditches and berms decreasing the spacing on steeper slopes or on more erodible soils; • construct temporary berms of subsoil, sandbags, wattles, bio-degradable geotextiles or geo-ridge during construction activities; • armour the upslope face of berms with geotextile, rock, logs or sandbags; • import small diameter slash then roll back and walk down; • reseed an annual cover crop as soon as feasible after construction; • transplant native shrubs, plant willow stakes or use other bioengineering techniques; • install slope indicators at locations where the risk of slope failure, or creep exists; consult a geotechnical engineer; and/or • shut down construction until the risk of erosion has been reduced or the conditions improve.
<i>Wind Erosion</i>	<ol style="list-style-type: none"> 2. Shut-down or relocate construction activities until winds dissipate and conditions improve. 3. Consider using the following techniques if wind erosion of the topsoil/strippings windrow is of concern: <ul style="list-style-type: none"> • apply water to the topsoil/strippings windrow; • windrow snow (if available) over the topsoil/strippings windrow; • tackify (at rate recommended by the distributor) the topsoil/strippings windrow; and/or • pack the topsoil/strippings windrow with a sheepsfoot packer or other suitable equipment. 4. Consider using the following techniques if wind erosion is of concern after topsoil/strippings replacement: <ul style="list-style-type: none"> • seed cereal or sterile hybrid cover crop; • employ straw crimping at 2-2.5 tonnes/ha; • apply hydromulch or tackifier; • import small diameter slash for use as rollback - walk down slash; • add locally available manure and cultivate; and/or • install wind fences.

Concern	Mitigation Options
<i>Erosion of or Failure of Streambanks</i>	5. Implement one or a combination of the following mitigation techniques: <ul style="list-style-type: none">• install vegetated geogrid;• install coir logs;• install log cribwall bank protection;• install biodegradable erosion control matting;• plant willow stakes in the spring;• transplant willow clumps, install willow wattles, or brush layering;• install tree revetments; and/or• install rock gabions or line the banks with riprap (subject to Company approval and applicable regulatory requirements).

9.0 CONTAMINATED SOILS CONTINGENCY PLAN

The excavation of soils is required during Project construction. During these activities, there is a potential to encounter soil or water contamination. The purpose of this contingency plan is to set out the general requirements for consistent, safe and environmentally responsible handling of contaminated soil (and accompanying water). For abandonment and decommissioning projects, the Project scope may include specific requirements for the assessment and remediation of any known and/or potential contamination identified within the Project footprint or encountered during abandonment or decommissioning activities.

Goals

The contingency plan outlined below has been developed and will be employed to:

- prevent adverse effects on the environment, per applicable provincial and/or federal legislation and guidelines.
- ensure appropriate federal and provincial reporting (see Release Contingency Plan), including filing a *Notification of Contamination*, in accordance with CER requirements.
- maintain a safe working environment on the construction footprint.
- employ environmentally and economically responsible construction practices at all times and in accordance with applicable industry standards.

The Company, its contractor, and sub-contractor are responsible for implementing and maintaining all mitigation measures unless otherwise specified.

Known or Potentially Contaminated Sites

A known or potentially contaminated site may be identified by the Company's Remediation Specialist through historical information review and/or by completing soil sampling prior to construction activities. Where contaminated soils are encountered during construction activities, they will be excavated and safely stored on the construction footprint in approved locations for disposal.

1. Contaminated soils must be appropriately tested in order to characterize them as non-hazardous or hazardous and determine the appropriate handling, disposal, and documentation in accordance with the Company waste management plan and applicable regulatory requirements.
2. If the management of contaminated soils pose an environmental risk to other areas of the site or adjacent properties, the Company will direct the Contractor to install additional measures such as an impervious berm around the work area, lined containment, or water management to prevent contaminant migration.
3. The Company Remediation Specialist may direct the Project to complete additional activities related to the removal of contaminated soils, such as engaging a third-party Environmental Resource Specialist for field support and/or reporting purposes, collecting confirmatory samples from excavation extents, or completing additional soil assessment.
4. The appropriate regulatory reporting will be completed by the Company, if required, as determined by the Company's Regulatory Compliance Group in consultation with the Remediation Specialist.

Unknown Contaminated Sites

Contamination that has not been previously identified may be encountered during Project construction. Observations indicating potential contamination may be visual (e.g., stained soil, sheen, free product, garbage or debris) or olfactory. In the event a suspected contaminated area is encountered, the procedure will be as follows:

1. Work will be suspended in the immediate area.
2. The Contractor will immediately notify the Construction Manager and Environmental Inspector(s) or designate(s) of the situation.
3. The Company's Remediation Specialist will determine whether the soil in question may be potentially contaminated based on:
 - the specific location of the suspect/contaminated soil
 - adjacent land uses

- reported field observations
4. The Company may engage a third-party consultant is to conduct additional site assessment, including soil sampling.
 5. The appropriate regulatory reporting will be completed by the Company, if required, as determined by the Company's Regulatory Compliance Group in consultation with the Remediation Specialist.
 6. The Contractor will secure the area and any suspect excavated soil, and any unnecessary contact/disturbance of the soil will be avoided. Potential securing methods include:
 - placing the excavated soil on a impervious liner
 - covering the excavated soil with an impervious membrane to isolate it from weather events
 - storing the excavated soil away from any watercourses, wetlands, or crops
 - placing impermeable berms around the excavated material to isolate and contain the soil
 7. If an excavation can be safely left open, the area will be secured until further direction can be obtained. If the excavation cannot be safely left open, it will be backfilled with its own excavated materials.
 8. Work will be suspended if:
 - continuing to excavate in a suspect/contaminated site could pose a threat to the health and safety of the worker(s) (see applicable regulatory guidelines)
 - issues of non-compliance with environmental legislation might result from continuing to work in areas of contaminated soils
 9. Resolution of the management of contaminated materials will include the following points:
 - completion of the work
 - ensuring compliance concerns are addressed
 - ensuring health and safety concerns are addressed (see applicable regulatory guidelines)
 - ensuring proper manifesting, removal, treatment, and disposal of any soil and/or water where the Company has responsibility (see Release Contingency Plan)
 10. The Company will determine the appropriate cleanup and disposal of materials based on analytical results and applicable regulatory requirements. Contaminated soils will be excavated, stockpiled, manifested, and disposed of at an approved facility.

10.0 DRILLING MUD RELEASE CONTINGENCY PLAN

During a trenchless crossing, an accidental release of drilling mud to the terrestrial environment, adjacent to or into a watercourse or waterbody could adversely affect the environment. The following contingency plan has been developed to ensure that appropriate measures are in place to minimize the risk of adverse effects during trenchless crossings, including watercourse or waterbody, facility and/or infrastructure crossings.

Both the Contractor and the Company must be diligent during all aspects of directional drilling to ensure that the potential for an instream drilling mud release is minimized; or if it does occur, that environmental effects are minimized. Should the Contractor have an instream drilling mud release contingency plan in place, both plans will be reviewed by the Company with the Contractor to ensure that the most stringent conditions of both plans apply.

10.1 Emergency Response

The loss of drilling mud into seams of coarse material, fissures, etc. routinely occurs during drilling operations. Since drilling fluid does not always flow to the surface, a loss does not necessarily indicate that the drilling mud has been released onto near shore areas or into the watercourse or waterbody. Nevertheless, a release of drilling mud into a watercourse or waterbody can adversely affect fish and fish habitat.

General Emergency Response Measures

1. Suspend drilling operations immediately if excessive loss of drilling mud or significant or unusual changes in annular pressure is noted and conduct a detailed examination of the drill path and surrounding area for evidence of a release to the surface.
2. Immediately notify both the Construction Manager and the Environmental Inspector(s) or designate(s) if a drilling mud release is observed. The Environmental Inspector(s) or designate(s) will inform the Environmental Planner.
3. Contain the release to prevent drilling mud from migrating away from release location or entering the watercourse or waterbody from near shore areas by installing a berm of subsoil, sandbags or other material approved by the Environmental Inspector(s) or designate(s).
4. If the volume of mud released is not great enough to allow practicable containment and recovery, the mud release will be allowed to dry and dissipate naturally.
5. If the drilling mud release enters a watercourse or waterbody the Environmental Inspector(s) or designate(s) will immediately notify the Construction Manager and Environmental Planner.
6. Any drilling mud release that enters a watercourse or waterbody or that may cause or is causing an adverse effect is reportable. The Environmental Inspector(s) or designate(s) or Environmental Planner will report the incident to the regulator responsible for emergency spill response coordination as soon as possible and within 24 hours of the release. Refer to Emergency Reporting Contacts (Appendix 1A).
7. The Environmental Planner or designate will document the incident in the TC Energy EHSM Incident Management system within 24 hours of the incident.
8. The Environmental Inspector(s) or designate(s) will prepare a report summarizing the events leading up to the release as well as the environmental protection measures taken following the release in preparation for follow-up regulatory reporting.
9. Continue to conduct water quality sampling as prescribed by the Water Quality Monitoring Plan, and as specified by the Environmental Inspector(s) or designate(s).

Containment and Recovery (Instream)

Isolate the drilling fluid release from the watercourse or waterbody to the extent practicable. Site specific limitations (e.g. deep water, higher flow or inaccessible areas) may not allow for a practicable isolation of the release location.

1. Consider the following options for isolating the drilling fluid release area:
 - Construct a dam and pump set-up on smaller watercourses or waterbodies, if practicable.
 - Install a flume to divert water past the release area.
 - Install coffer dams made of sandbags or sheet metal.
 - Attempt to contain the release point within an area isolated with aquadams or sheet metal, etc.
2. Consider the following options for removal of mud from instream:
 - Use trash pumps or hydrovac truck. If trash pumps are used, ensure that the pump-off area does not drain directly into the watercourse or waterbody, or construct a holding area.
 - If a hydrovac truck is used, ensure that all activities comply with the regulatory waste disposal requirements.
 - Recover accumulated drilling fluid from the watercourse or waterbody by hand, pump, or hoe.
 - In consultation with the responsible regulator, leave mud in place if watercourse or waterbody flow velocity or depth limits safe recovery operations or if recovery will result in unacceptable terrain or instream damage.
3. Dispose of drilling fluid in accordance with appropriate waste management requirements.

Containment and Recovery (Onshore)

1. For onshore mud release, consider the following options for immediate containment.
 - If accessible by heavy equipment, immediately construct berms or excavate a sump for containment. Use trash pumps or hydrovac truck.
 - If not accessible by heavy equipment, construct weirs using logs, sand bags, silt fence, rolls of matting, shovel trenches, and/or filter cloth and a containment area where appropriate.
2. Before allowing filtered water to enter the watercourse or waterbody, ensure that the TSS or turbidity level is within applicable regulatory water quality guidelines.

10.2 PLANS FOR POTENTIAL CONTINUANCE OF DRILLING

Drilling will only be allowed to resume if the potential for significant adverse effects on the environment is low, as determined by project management in consultation with environment and aquatic specialists, and drilling or geotechnical consultant (if warranted).

1. Implement measures to prevent the further release of drilling mud into the watercourse or waterbody. Appropriate measures will vary depending on the lessons learned during the previous drill attempt.
2. Progressively implement the following measures to prevent the further release of drilling mud into the watercourse or waterbody.
 - a) Ensure that appropriate structures, materials, equipment and personnel are in place and available in the event of a subsequent release of drilling mud.
 - b) Reduce drilling mud pressures if practicable.
 - c) Plug fissures/fracture with nontoxic sealers or plugging agents pumped into the drill hole and left undisturbed for an appropriate period of time whereupon drilling will be resumed. If the sealing agents are not successful, drilling will be suspended and the plan reviewed and revised.
 - d) Employ downhole cementing to either seal off the problem zone for re-drilling or seal off a large portion of the existing drill hole to a point where a new drill path (generally at a lower elevation) can be attempted. If these measures are unsuccessful, then drilling will be suspended and the plan reviewed and revised.
 - e) Move the drill and attempt to re-drill from a new location employing the same protection measures implemented on the initial drill if conditions indicate that a second drill will be successful. Prior to commencing the re-drill, the proposed drill path will be reviewed and revised accordingly.

11.0 PLANT SPECIES AND ECOLOGICAL COMMUNITIES OF CONCERN DISCOVERY CONTINGENCY PLAN

In the event that previously unidentified rare plants or ecological communities are discovered, the plant or ecological community will be assessed and appropriate mitigation measures will be determined. The appropriate site-specific mitigation measures will be determined following an assessment by a vegetation specialist, which will consider the following:

- the location of the plant or ecological community on the construction footprint;
- the relative rarity of the plant or ecological community (regionally, nationally, etc.);
- the local abundance of the plant or ecological community;
- the growth habit and propagation strategy of the plant or ecological community; and
- the habitat preferences of the plant or ecological community.

The suite of mitigations that may be implemented includes the following:

- narrow down the proposed area of disturbance and protect the site using snow fencing and signage;
- inform all users of access restrictions in the vicinity of fenced sites;
- temporarily cover the site with snow (given the season), geotextile pads, flex net, swamp mats, or equivalent;
- extend road or watercourse bores to avoid or minimize effects on the site;
- realign the route to avoid the site; or
- propagate rare plants or specific portions of sensitive ecological communities, via vegetative or reproductive means (e.g., harvesting of seed from the construction footprint or adjacent area, salvaging and transplanting portions of sod and surrounding vegetation or collecting of cuttings).

Any new mitigation will be communicated to appropriate Project personnel including the Contractor.

12.0 WILDLIFE SPECIES OF CONCERN DISCOVERY CONTINGENCY PLAN

Wildlife Species of Concern Discovery Prior to Construction

In the event that wildlife species of concern or their site-specific habitat is discovered during future wildlife studies, the discovery will be assessed and appropriate mitigation measures will be determined. The wildlife or habitat will be assessed by wildlife specialists based on the following criteria:

- the location of the wildlife or habitat feature with respect to the proposed area of development;
- the presence of topographic features or vegetation to effectively screen the wildlife or habitat from construction activities;
- the timing of construction versus the critical timing constraints for the species; and
- the potential for an alteration of construction activities to minimize or avoid sensory disturbance.

The suite of mitigation options that may be implemented includes the following:

- abide by seasonal timing constraints within the recommended set back distances;
- abide by daily timing restrictions on construction activities; narrow down the proposed area of disturbance and protect the site using snow fencing and signage;
- alter or delay construction activities to avoid sensory disturbance (e.g., no burning);
- extend road or watercourse bores to avoid or minimize effects on the site;
- inform all users of access restrictions in the vicinity of fenced sites;
- realign the route to avoid the site;
- install nest boxes or platforms or otherwise replace or enhance habitat during reclamation or restoration; and
- relocate nests or other habitat features or individuals if practicable and monitor post-construction response.

In the event a discovery is made during supplemental wildlife surveys, the appropriate mitigation will be implemented, and the Environmental Alignment Sheets and/or other Project-specific environmental documents will be amended to incorporate these measures.

Wildlife Species of Concern Discovery During Construction

In the event that wildlife species of concern or their site-specific habitat are discovered during construction, the discovery will be assessed based on the criteria provided above and appropriate mitigation measures will be implemented from the list outlined below.

1. Suspend work immediately in the vicinity of any newly discovered wildlife species of concern. Work at that location may not resume until the measures below are undertaken.
2. Notify the Environmental Inspector(s) or designate(s) who will notify the Construction Manager.
3. The Environmental Inspector(s) or designate(s) will assess the discovery and either allow construction to be resumed or, in the event of a confirmed or potential discovery, proceed by notifying:
 - applicable government agencies (e.g., provincial regulator, Environment Canada) as required (Appendix 1B); and
 - the Company's Wildlife Resource Specialist.
4. The Company's Wildlife Resource Specialist may deem it necessary to visit the site to develop an appropriate mitigation plan in consultation with the Company's Environmental Planner. The mitigation measures available include those listed above.

13.0 CULTURAL RESOURCE DISCOVERY CONTINGENCY PLAN

If unanticipated cultural resources are identified during construction activities, the Cultural Resource Discovery Contingency Plan will be implemented. This plan applies to all personnel of the Company, their Contractor(s) and subcontractors during construction of the Project and is designed to address the following unanticipated cultural resource sites:

- traditional land and resource use (TLRU) sites
- heritage sites, including historic, archaeological and paleontological resources
- human remains

In the event of the discovery of an unanticipated cultural resource site during construction, regardless of site type, the Company will rely on the following four steps to inform decision-making.

<p>Step 1 – Encounter</p>	<ul style="list-style-type: none"> • Suspend work immediately near the suspected find; do not further disturb the location. • Immediately notify the Environmental Inspector(s) or designate(s) of the location and nature of the suspected find, who will notify the Company’s Construction Manager or designate and the Environmental Planner. Indigenous Relations will be notified of the location and nature of the suspected find. • A temporary protective buffer area may be necessary to immediately protect the site, as determined by the Environmental Inspector(s) or designate(s). The size of the buffer will reflect the nature and extent of the site. 		
<p>Step 2 – Initial Assessment</p>	<ul style="list-style-type: none"> • The Environmental Inspector(s) or designate(s) will determine if a travel lane can be accommodated and maintained without affecting the integrity of the site. Access will be restricted or prohibited as necessary to ensure no additional disturbance to the site occurs. The Construction Manager or designate will be responsible for determining what travel is essential and ensuring restrictions are met. • The Environmental Inspector(s) or designate(s) will work with the Construction Manager or designate to collect information and undertake an initial non-invasive assessment of the site. The Environmental Inspector(s) or designate(s) will ensure any necessary interim protective measures (e.g., flagging, temporary fencing/barriers) are promptly implemented. • Upon advice of the Environmental Planner, a Heritage Resource Specialist will be consulted to aide in the initial assessment of the site as necessary. If human remains are suspected but not confirmed, the Construction Manager or designate will immediately contact the Heritage Resource Specialist to determine if the measures for human remains must be enacted. • No materials are to be collected by personnel except for the Environmental Inspector(s) or designate(s) or the Heritage Resource Specialist where collection is warranted to ensure preservation/protection. Any materials collected by the Environmental Inspector(s) or designate(s) will be provided to the Heritage Resource Specialist for appropriate analysis and curation, as necessary. • If human remains are suspected, no collection of any kind is permitted and the site must be secured. • If the initial assessment does not indicate cultural origin or human remains, no further action is necessary and construction can resume 		
<p>Step 3 – Consultation and Engagement</p>	<ul style="list-style-type: none"> • The activities in this step are dependant on the outcomes of the initial assessment and will be implemented as identified below. 		
	<p style="text-align: center;">TLRU Sites</p> <ul style="list-style-type: none"> • Indigenous Relations will collaborate with the Construction Manager, Environmental Planner, Heritage Resource Specialist and/or Indigenous Participant(s), as appropriate, to develop an appropriate mitigation plan. • Potentially affected Indigenous groups will be informed of the discovery and the planned mitigation to be implemented. 	<p style="text-align: center;">Heritage Sites</p> <ul style="list-style-type: none"> • The Heritage Resource Specialist will develop an appropriate mitigation plan in consultation with the Environmental Planner and the responsible Provincial ministry/agency. 	<p style="text-align: center;">Human Remains¹</p> <ul style="list-style-type: none"> • If there are clear visible indications that the remains are human, the Company will contact the RCMP or regional police immediately (Law Enforcement) (see Appendix 1B of the EPP). • If the remains are confirmed to be human and appear to be of some antiquity (e.g. buried, aged), the Heritage Resource Specialist will provide initial notification to the Provincial ministry/agency responsible for heritage resources.

¹ If the remains are not human, the activities listed below “Heritage Sites” of this step will be implemented.

Step 3 (Cont'd)	• TLRU Sites	• Heritage Sites	• Human Remains
	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • The Environmental Planner and/or the Heritage Resource Specialist will review the planned mitigation strategy with the responsible Provincial ministry/agency and will implement additional measures if required. • Notification of the discovery and the planned mitigation to be implemented will be provided to interested potentially affected Indigenous group(s), where applicable. 	<ul style="list-style-type: none"> • Project personnel will allow Law Enforcement to conduct their investigation without interference. The Construction Manager or designate will serve as point of contact for Law Enforcement personnel and any other officials (e.g. coroner, forensic specialists) associated with any investigation, until such a time that a Company communication or management representative assumes a liaison role, if necessary. <p>• If Law Enforcement determines that the site <u>is</u> a crime scene:</p> <ul style="list-style-type: none"> • Subsequent procedures will follow applicable regulations for found human remains, and Law Enforcement will manage the site. The Construction Manager or designate will support the investigation and work will not resume until the investigation is complete and authorization to resume construction is received from Law Enforcement. <p>• If Law Enforcement determines that the site <u>is not</u> a crime scene:</p> <ul style="list-style-type: none"> • Law Enforcement will engage the appropriate Provincial ministry/agency responsible for heritage resources, or will advise the Construction Manager or designate or Heritage Resource Specialist to engage the agency directly. The responsible Provincial ministry/agency has the authority and responsibility to determine the appropriate course of action in relation to found human remains of an archaeological nature. • In consultation with the Environmental Planner, the Heritage Resource Specialist will either support or complete an investigation as required by applicable provincial laws, regulations, permits and guidelines pertaining to found burial sites. • If Indigenous origin is suspected, the Company will provide notification to appropriate Indigenous groups and engage to determine appropriate next steps, as guided by the responsible Provincial ministry/agency. • The Construction Manager or designate will ensure that other potentially affected parties are engaged as appropriate (e.g., the landowner or local land authority).
Step 4 – Resolution	<ul style="list-style-type: none"> • The find will be handled in accordance with all applicable requirements and permits, and in consideration of the recommendations of potentially affected Indigenous groups to the degree that provincial regulations allow. • Approved mitigation will be implemented to the satisfaction of the responsible Provincial ministry/agency. Additional agreed-upon mitigation between the Company and potentially affected Indigenous groups may also be implemented, if applicable. • Work may resume once all obligations are met as verified by the Environmental Inspector(s) and/or the Construction Manager or designate. 		

APPENDIX 1F
MANAGEMENT PLANS

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1.0 CHEMICAL AND WASTE MANAGEMENT PLAN

1.1 Purpose

The Chemical and Waste Management Plan has been prepared to provide guidelines for dealing with the generation of project waste and outlines specific measures to be followed by all Company employees, contractors and consultants who conduct work on behalf of the Company during construction of the Project.

The plan provides guidelines for dealing with the procurement, storing, handling and disposal of hazardous materials, chemicals and wastes in environmentally responsible manner. This plan will reduce the likelihood of an accidental release of potentially hazardous products and wastes into the environment during construction.

All employees, contractors and consultants will abide by all federal, provincial and local requirements for the storage, handling, transport, disposal and release reporting requirements of all products and waste materials that are potentially hazardous to human health and the environment.

The Environmental Inspector(s) or designate(s) are responsible for ensuring compliance with TC Energy's Environmental Guidelines and all applicable codes, regulations and industry standards for waste management and handling chemicals. Where a discrepancy occurs, the most stringent requirements apply. In the event of a release (i.e. spill), the Release Contingency Plan (see Appendix 1E of this EPP) will be implemented. The Release Contingency Plan sets forth the lines of communication and procedures to follow in order to facilitate containment and clean-up should a release occur.

1.2 Guiding Principles

The Company is committed to performing its activities in an environmentally responsible manner. The following general guiding principles have been incorporated into this plan:

- reasonable preventative measures will be taken to avoid the release of wastes and hazardous materials into the environment;
- all waste and hazardous material releases will be reported to the Environmental Inspector(s) or designate(s) and to the appropriate authorities, if warranted;
- all waste and hazardous material releases will be cleaned up promptly and thoroughly; and
- waste and hazardous materials will, to the extent feasible, be recycled, disposed of or moved to an approved area as required.

1.2.1 Application

This Chemical and Waste Management Plan applies to the construction footprint, all staging areas, construction yards and public roadways being used in association with the Project. Awareness of these requirements will be integrated as appropriate into preconstruction training and orientations.

1.2.2 Description of Wastes and Chemicals

Potential Project related wastes have been divided into two categories for discussion of storage, handling and disposal procedures.

Solid Nonhazardous Wastes – include garbage and debris generated through the activities of personnel during construction and construction footprint reclamation. These wastes are nontoxic in nature and include, but are not necessarily limited to:

- food wastes;
- pipe tape and coating;
- spent welding rods;
- grinder pads;
- styrofoam and plastics;
- wood;

- wire;
- survey stakes/flagging tape;
- used geotextile; and
- metal strapping.

Hazardous Wastes – each province has its own criteria for determining if waste is hazardous and this varies from province to province. Most jurisdictions identify hazardous waste by listed substances and by characteristics defined in their respective regulations. Hazardous waste generally has one or more of the following characteristics:

- Flammable,
- Reactive
- Corrosive
- Toxic
- Leachable toxic (e.g. metals and BTEX)
- Radioactivity (e.g. activity levels for Naturally Occurring Radioactive Materials).

Industrial Wastes - include wastes and products generated or utilized during construction. These materials may contain quantities of potentially toxic substances in the form of residues and include, but are not necessarily limited to:

- used oils (engine oil, transmission/drive train oil, hydraulic/lube oil, gear oils, lubricating greases);
- used lube filters;
- spent grease cartridges;
- used antifreeze (containers and cans of ethylene glycol, propylene glycol);
- contaminated soil, vegetation and/or absorbents that may contain hydraulic fluid, gasoline, diesel or lube oil;
- used solvents;
- used batteries (automotive/equipment);
- film processing waste liquids;
- spent cleaning products and associated materials rags;
- Naturally Occurring Radioactive Materials (NORMs);
- Polychlorinated Biphenyls (PCBs); and
- Asbestos.
- Potential Project related chemicals that are likely to be found on the construction sites include, but are not necessarily limited to:
 - batteries;
 - cleaning products;
 - fuels (gasoline, diesel, propane);
 - lubricants (engine oil, transmission/drive train oil, hydraulic oil, gear oil, lubricating grease);
 - coolants (ethylene glycol, propylene glycol);
 - paints and solvents;
 - film processing chemicals; and
 - glues (including epoxy and urethane coating products) and cements.

1.2.3 Mitigation Measures

All employees, contractors and consultants of the Company will be required to comply with applicable regulations for the containment, handling, storage, use and disposal of wastes and chemicals. The following are minimum requirements.

General Measures

1. Construction yards and staging areas that are designated as an industrial waste or chemical storage area will be selected and designed to:
 - avoid wetlands, watercourses, sensitive vegetation, highly permeable soils, steep slopes and water supply wells when feasible;
 - prevent vehicle incidents by providing unobstructed access (for delivery, disposal and emergency vehicles);
 - provide safe storage areas, including secondary containment, for all chemical liquids and hazardous wastes in accordance with applicable regulatory requirements; and
 - provide unobstructed access/egress to/from emergency response materials and equipment.
2. All Project staff with waste management and hazardous materials responsibilities will be educated in accordance with regulatory requirements specific to the Project. All personnel shall understand their responsibilities for proper handling, identification, documentation and storage of wastes and hazardous materials.
3. An appropriate number of portable toilets shall be made available to ensure each crew has ready access to washroom facilities. The facilities will be serviced and cleaned regularly and will be adequately secured. All site personnel are to use portable toilets as provided.
4. The Company shall ensure that a hazardous waste generator number or equivalent is in place, for inclusion on appropriate shipping documentation. The Contractor may perform generator/consignor responsibilities on behalf of the Company, and shipping documents must specify the Company name, and the Contractor shall include their name and contact information (e.g. Contractor on behalf of the Company).

Release Prevention and Response Equipment

1. The Contractors' equipment will be clean and in good operating condition.
2. Appropriate measures will be taken immediately to limit the spread of the contamination, in accordance with the Release Contingency Plan (see Appendix 1E of this EPP).
3. Prior to construction kick-off, the Contractor will ensure that all release containment (spill kits) and recovery equipment and materials are onsite or readily available.
4. Bulk fuel trucks, service vehicles, and pick-up trucks equipped with box-mounted fuel tanks will carry:
 - fire extinguishers;
 - shovels; and
 - hydrocarbon release containment (spill kit) complete with a minimum of 10 kg of sorbent material for clean-up of small releases.
 - Service vehicles will also carry an impermeable barrier for placing under vehicles to be serviced.
5. All mobile equipment (e.g. track hoes, bull dozers, side booms) and Contractor vehicles shall be equipped with a spill kit.
6. Sorbents, barrier materials (e.g., impermeable liners, etc.), shovels, a water boom, and 210 L storage drums will be stockpiled at the Contractor yards/staging areas to respond to small releases.
7. When working in or near (i.e. within 100 m) of a watercourse or waterbody, release containment (spill kits) shall include booms, sorbent pads or a functionally equivalent containment structure, and they shall be onsite in the unlikely event of an accidental release of chemicals, hazardous materials or waste.

Waste and Chemical Handling

1. Personnel who will be handling waste materials will possess valid WHMIS training.

2. Personnel who will be handling or transporting waste or chemicals will have current Transportation of Dangerous Goods (TDG) certification.
3. During waste and chemical handling activities, employees and/or contractors will use appropriate personal protective equipment to prevent any contact with material.
4. Procedures for safe loading and unloading of products will be followed
 - service vehicles will be equipped with automatic shut-off valves;
 - brakes will be set;
 - the vehicle will be grounded if the product is flammable;
 - the operator will observe loading and unloading activities at all times; and
 - when complete, the operator will examine all outlets for leakage and take corrective action if warranted.

Waste and Chemical Storage

1. An appropriate number of waste and recycling receptacles will be made available during the Project.
2. Designated industrial waste storage areas at a facility shall be designed to meet all applicable federal and provincial regulations.
3. Hazardous materials will be stored in designated storage area(s). Short term hazardous material storage on the right-of-way may be designated at the discretion of the Environmental Inspector(s) or designate(s), if required for specific tasks.
4. Hazardous materials and industrial wastes will be stored greater than 100 m from a wetland, watercourse or waterbody, where feasible.
5. Designated storage areas will be clearly identified and secured. Chemicals and wastes stored in any containers must be clearly labelled to comply with TDG Act, WHMIS regulations, Canada Occupational Health and Safety Regulations (SOR/86-304) and National Fire Code of Canada as well as applicable provincial regulations.
6. Hazardous wastes and chemicals will be segregated according to the hazard present as per the National Fire Code of Canada as well as applicable provincial regulations.
7. Secondary containment may be required depending on the location, type, volume and duration of the waste or chemical being stored. Secondary containment will be in accordance with applicable federal, provincial and municipal requirements. Secondary containment is not required for temporary chemical storage if:
 - The storage location is more than 100 m from a sensitive environmental area or feature (e.g., watercourse, wetland, rare plants, etc.);
 - The maximum volume being stored does not exceed 55 gallons (one drum); and
 - The container can be resealed.
8. Containment devices will be constructed from suitable metallic or non-metallic materials capable of containing the stored product. Liners used for secondary containment shall be placed and maintained to ensure their effectiveness and intended use.
9. Secondary containment areas not protected from the elements will be monitored regularly to ensure that ice, snow, or rainwater have not decreased the volumetric capacity for storage of a release to be less than 110% of the aggregate storage volume of the containment area. Water accumulated within a secondary containment structure may be removed if authorized by the Environmental Inspector(s) or designate(s). If there is visible hydrocarbon sheen, the water will be collected for proper storage and disposal.
10. Containers and tanks will be closed when not in use. Drain valves will be locked to prevent accidental or unauthorized releases.

11. Secured non-hazardous materials (i.e., skids, geotextiles, survey stakes etc.) that pose no threat to the surrounding ecosystem will be neatly stockpiled in locations along the right-of-way for disposal. The disposal frequency is dependent upon the type of material stockpiled and will be determined by the Environmental Inspector(s) or designate(s).
12. The Contractor will visually inspect designated hazardous material and chemical storage areas and aboveground tanks on a regular basis, as well as when fuel tanks are refilled. The Contractor shall maintain inspection records in accordance with applicable federal, provincial and local requirements, and upon request provide the inspection records to the Company. Identified problems or deficiencies shall be corrected in a timely manner.
13. The Contractor will remove all secondary containment structures at the end of the construction phase and return the impoundment area to its original contours and appearance, including establishing appropriate drainage patterns and vegetation cover.

Waste Disposal

1. Waste materials will be disposed of in accordance with federal and provincial legislation and municipal/regional regulations as required. Waste materials may also be managed under Legal Agreements or the Retirement and Sale of Surplus Materials.
2. Each construction site will be equipped with adequate garbage receptacles for solid non-hazardous wastes and debris. These materials will be collected as required and disposed of at approved locations. Food wastes will be stored in animal proof (bear-proof) containers and transported to an appropriate landfill site.
3. Receptacles for industrial wastes generated during construction will be provided in order to keep them segregated from non-hazardous waste. Used oil and oil filters will be placed in sealed containers and delivered for disposal by a qualified service contractor.
4. Receptacles for recycling various products (e.g., paper and tin) will be available at Project construction yards and camps and will be hauled to appropriate recycling depots.
5. NORMs will be transferred to approved locations by a qualified contractor for final disposal.
6. PCB treatment or disposal facilities must be pre-approved by the Company. This includes third party waste brokers, consultants and contractors. PCB concentration must be thoroughly characterized prior to special treatment or disposal.

Documentation and Record Keeping

1. Safety Data Sheets (SDSs) will be available for each product stored at a particular construction yard or staging area.
2. The Contractor will maintain a record of the routine inspections performed on the industrial waste storage area(s). The Contractor will furnish the Company construction office with any and all inspection reports monthly.
3. Shipping documents for hazardous waste (e.g., Federal Movement Document, manifests, recycle docket, etc.) will be reviewed and signed by an authorized Company representative with current TDG certification when hazardous waste is transferred from a storage facility for transport to a waste management facility. In some provinces, a copy of the manifest must be sent to the regulator.
4. The Contractor will provide the Environmental Inspector(s) or designate(s) with copies of industrial and hazardous waste shipping documents. Industrial and hazardous waste shipping documents (e.g., Federal Movement Document, manifests, recycle docket, etc.) must be tracked and manifests be reconciled. Until confirmation that the waste has been received at its destination, the waste is the responsibility of the Company.

Table 1. Timeframes for Submitting Copy #1 of the Manifest Document and Manifest Reconciliation

Province	Authority	Timeframe for Sending Manifests to Authority	Timeframe to Reconcile Manifests
Alberta	Alberta Environment and Parks (AEP)	2 business days	No timeframe specified. Note: Receiver must send Copy #6 to the generator within 2 days of receipt.
Alberta	Alberta Energy Regulator (AER)	60 days	60 days

5. Copies of manifest records must be kept in a central location for a minimum of two years after the waste has arrived at its final disposal location. Shipping documents for hazardous wastes must be kept with the project files or at the nearest Company facility or office, in accordance with provincial requirements. All provinces stipulate a five-year retention schedule.

2.0 TRAFFIC CONTROL MANAGEMENT PLAN

This plan deals with the management and control of construction traffic on the construction footprint and temporary access routes. It covers activities during preconstruction, construction and post-construction phases of the Project.

2.1 Purpose

The Traffic Control Management Plan provides guidelines for vehicular use on the construction footprint and associated access roads. The intent is to minimize disturbance resulting from construction on these lands, particularly in riparian areas and in areas of high erosion hazard. All vehicle and equipment operators will adhere to the contingency measures for wet/thawed conditions outlined in the Wet Soils Contingency Plan (see Appendix 1E of this EPP).

The plan objectives will be accomplished by minimizing the development of access routes, selecting appropriate access routes that cause the least disturbance, managing traffic on these routes and determining appropriate as-left treatment at the completion of the Project.

2.2 Preconstruction

The applicable provincial authorities will be notified of all access road upgrading requirements and the Company will accommodate continued public access during construction whenever feasible.

The Project will adhere to the following principles:

1. To prevent inadvertent trespass, stake the approved construction footprint to clearly delineate all boundaries.
2. All motorized vehicle traffic, including ATV, Argo and snowmobile traffic, will be confined to the approved route, access roads or trails except where specifically authorized by the appropriate authority.
3. Vehicle travel across wetlands and riparian areas should be reduced to the extent feasible.

The development and maintenance of access roads required prior to, or during construction, will adhere to the relevant requirements set out in this EPP.

2.3 Construction

During construction, traffic will adhere to the following guidelines:

1. All Project personnel and other visitors to the right-of-way will participate in the Contractor orientation program.
2. All access points to the construction footprint will be flagged and signed to discourage public use.
3. All vehicular traffic will be restricted to the approved and staked construction footprint.
4. Construction and inspection personnel and visitors to the construction footprint and other work sites will receive instruction on locations suitable for parking vehicles and equipment.
5. The Company, Contractor and all subcontractor personnel will avoid areas that are fenced or staked and abide by any restrictions on in/out privileges that are implemented in areas requiring special protection.
6. The Company, Contractor and all subcontractor personnel will limit unnecessary travel on the construction footprint during the course of the work.
7. Special measures such as the limiting of construction traffic or implementing of swamp mats or matting may be warranted in areas with poorly-drained and organic soils (see the Wet Soils Contingency Plan in Appendix 1E of this EPP).
8. Construction personnel will be transported between construction yards and the construction site by multi-passenger vehicles to the extent practicable, in order to minimize vehicle traffic.

9. Control measures may be put in place to ensure traffic adheres to special restrictions that are in effect (e.g., narrowing of work space to limit impact on sensitive environmental features or a species of concern).
10. The speed limit on the construction footprint will be designated by the Contractor. Speed limits may be lowered under specific conditions such as areas with poor visibility, steep terrain or areas where specific wildlife concerns have been identified.
11. All Project-related vehicles will follow applicable traffic, road-use and safety laws.
12. During non-frozen conditions, equipment travel, particularly that of heavy and/or tracked equipment, will make use of the striped and graded areas for travel and passing.
13. Stringing trucks require extra turning radius. Consequently, approaches to the right-of-way or existing public roads will be wider when used for stringing trucks. Where turnarounds are required on the right-of-way, extra space will be required on the travel side of the right-of-way. Previously disturbed areas will be used for this purpose, when feasible. Stringing trucks will be limited to access roads developed for their use. Turn around areas require approval by applicable government agencies.

2.4 Post-Construction

After construction is complete, restoration efforts will be initiated and traffic will adhere to the following principles to ensure there is as little disturbance as practicable.

1. All temporary construction access roads and shoo-flies will be reclaimed to preconstruction conditions or restored as per this EPP. Newly created access points will be blocked unless otherwise specified by the Company or the responsible regulator.
2. Vehicle traffic will be minimized on newly seeded areas until ground cover is re-established.
3. Routine access to the construction footprint for operation, maintenance and monitoring activities will be by way of pre-existing roads and trails wherever feasible. Where travel on the construction footprint in the vicinity of important vegetation is required (e.g., during reclamation monitoring) foot travel will be used whenever feasible. ATV/Argos will be used if necessary.
4. Efforts to control off-road vehicle use will be coordinated with the appropriate authorities and will continue until the construction footprint has been satisfactorily reclaimed. Methods to control access may include one or a combination of the following:
 - posting of appropriate signage at all points of access;
 - create a visual barrier to reduce line of sight;
 - installation of locking gates and fencing; and/or
 - installation of slash or rock barriers.

3.0 HYDROVAC SLURRY MANAGEMENT PLAN

3.1 Purpose

To provide a management plan for hydrovac slurry generated during construction activities in a manner that is protective of the environment and demonstrates compliance with applicable regulations. This management plan applies to all hydrovac slurry generated during construction activities in Canada.

3.2 Scope

This plan is to be used in conjunction with any relevant TC Energy standards for excavation activities and applies to all new projects, facility upgrades and modifications for all operating entities in Canada.

3.3 Pre-Excavation Contamination Risk Screening

The management of hydrovac slurry must consider the associated environmental risk. The determination of the potential for contamination is conducted during the pre-excavation contamination risk screening, which provides an initial indication of whether hydrovac slurry may be managed as “low risk of contamination or non-contaminated” or “potential risk of contamination” and allows for the planning around testing, storage, and onsite or offsite reuse and/or offsite disposal.

Selection of hydrovac slurry management methods is determined based on the likelihood of encountering contamination within the planned hydrovac excavation area. Contaminant risk screening will consider the following questions to assess the potential risk of encountering contamination during hydrovac excavation activities:

1. Are there any visual indications of potential contamination [surface staining, leaking gas, frozen soil (not in winter), stressed vegetation]?
2. Is hydrovac slurry being generated in the immediate vicinity of existing facility infrastructure (e.g. valves, risers, launchers/receivers, separators/tanks, blowdowns but excluding line pipe outside of fenced facilities.)?
3. Is hydrovac slurry being generated at an existing facility site and/or in the vicinity of existing or historical facilities/equipment that may be a potential source of contamination? (Note: this may include potential impacts related to onsite or offsite drainage.)
4. Is hydrovac slurry being generated around a pipeline where there is the potential for contamination surrounding the pipe, such as the presence of coal tar/asphalt coatings?

If the answer to all of these questions is NO, the hydrovac excavation area is considered low risk (Section 3.5). If any of these questions are answered YES, the hydrovac excavation area is considered potential risk (see Section 3.6). Historical information/records (e.g., site plans, previous sampling assessments) within the area(s) proposed for hydrovac excavation will be reviewed, where available, and may determine that slurry generated in the hydrovac excavation area can be considered low risk.

3.4 Pre-Excavation Soil Sampling

A pre-excavation soil sampling program may be completed within hydrovac excavation areas identified as “potential risk of contamination” to further characterize potential contamination risk and/or provide waste characterization information for disposal purposes. The number, location, and depth of samples must be determined based on the area and depth of hydrovac excavation activities and the volume of slurry generated. Additionally, analytical parameters must be determined based on potential contaminants that may be encountered and/or waste characterization requirements.

3.5 Low Risk of Contamination or Non-Contaminated

“Low risk of contamination or non-contaminated” refers to slurry which is anticipated to be free of impact from suspected contaminants based on the pre-excavation contamination risk screening or pre-construction sampling.

- Hydrovac slurry from new disturbances is generally of mineral soil and water content and has a low risk of contamination, therefore onsite reuse is the preferred method if subsidence is not a concern. The reuse area must be in an approved location(s) that has had the surface materials removed. If a soil berm is required to contain slurry, soil material used to construct the berm shall be of subsoil or an alternative material capable of containing the slurry (i.e., to prevent migration to a waterbody or onto topsoil). The Contractor will ensure that the Environmental Inspector(s) or designate(s) have reviewed and approved of the reuse location prior to starting hydrovac operations.
- If evidence of contamination is encountered during hydrovac excavation, manage the slurry as “potential risk of contamination” (Section 3.6). Observations indicating potential contamination may be visual (e.g., stained soil, sheen, free product, garbage or debris) or olfactory. Additionally, the Contaminated Soil Contingency Plan (Appendix 1E) must be implemented when contamination is suspected.

The following applies to the management of slurry characterized as “low risk of contamination or non-contaminated”:

- Slurry can either be temporarily stored onsite in bermed containment or in other containers (e.g., bins or tanks) approved by the project. Slurry must be stored in a way that ensures no uncontrolled surface run-off or release into the ground.
- Slurry may be transported offsite for disposal at a Company-approved waste management facility (i.e., “direct hauled”). Hydrovac slurry must be classified and shipped under the appropriate shipping documentation (e.g., Straight Bill of Lading, Waste Manifest).
- Slurry may be released into the hydrovac excavation if future subsidence is not a concern and the area is fenced until the tailings are dry.
- Dewatered slurry may be used as clean fill onsite or at another TC Energy property. Water may be discharged onsite in accordance with EPP requirements or transported offsite for disposal at a Company-approved waste management facility, in accordance with provincial waste regulations. Water must be classified and shipped under the appropriate shipping documentation (e.g. Straight Bill of Lading, Waste Manifest).

3.6 Potential Risk of Contamination

Slurry must be characterized as “potential risk of contamination” if the pre-excavation contamination risk screening indicates a potential for contamination, pre-construction soil sampling has confirmed the presence of contamination in the hydrovac excavation area, or contamination is encountered during hydrovac excavation activities.

The following applies to the storage, characterization and disposal of slurry characterized as “potential risk of contamination”:

- Slurry may be transported offsite for disposal at a Company-approved waste management facility (i.e., “direct hauled”) that is licenced to accept contaminated hydrovac waste. Hydrovac slurry must be classified and shipped under the appropriate shipping documentation (e.g., Straight Bill of Lading, Waste Manifest).
- If slurry is to be stored pending testing for potential onsite reuse or offsite disposal, arrangements must be made for temporary storage of slurry in adequate structures to prevent an interaction with the environment. Slurry must not be allowed to drain onto or into the ground. Options for onsite or offsite storage may include:
 - Bermed earthen pits constructed with an impermeable liner (i.e., slurry pits);
 - Clean tanks or bins (e.g., oilfield storage tanks, shale bins, metal slop tanks); and/or
 - Hydrovac trucks.

- Slurry that is determined to be non-contaminated may be managed as “low risk of contamination or non-contaminated”, as described in Section 3.5.
- Slurry that is confirmed to be contaminated must be transported offsite for disposal at a Company-approved waste management facility that is licenced to accept contaminated hydrovac wastes. Hydrovac slurry must be classified and shipped under the appropriate shipping documentation (e.g., Straight Bill of Lading, Waste Manifest).
- Where multiple slurry waste streams are present, known or potentially contaminated slurry must be kept separate from non-contaminated slurry.

3.7 Additional Requirements

- The Contractor is responsible to ensure that all hydrovac equipment and holding tanks are clean and free of contaminants prior to arriving on site to prevent potential cross-contamination. Hydrovac equipment will be inspected and approved for cleanliness, by the Environmental Inspector(s) or designate(s). Upon request by the Company, the Contractor must provide written proof of cleanliness.
- Only hydrovac slurry is to be put into a hydrovac slurry storage system. Do not mix other waste materials into an area designated for management of hydrovac slurry. Water used as part of the hydrovac system is permitted but storage capabilities need to be considered.
- Hydrovac slurry storage areas must be secure to ensure no hazards to site personnel or visitors, the public and/or wildlife.
- If near water bodies and/or environmentally sensitive areas, utilize any topographical features that may create a physical barrier that would prevent the migration of slurry towards the sensitive area.
- Unlined slurry pits are not to be located in areas of known or potential contamination.
- Salvage topsoil prior to hydrovac use in all areas with agricultural potential.
- For waste characterization purposes, hydrovac slurry should be considered a liquid waste unless it is determined to be a solid through laboratory analysis of a representative sample (e.g., negative result for free liquid, based on laboratory analysis using the Paint Filter Test). Liquid wastes must be transported in accordance with applicable regulations and must not be sent to landfill.
- Slurry should not be classified as hazardous waste or shipped under a Waste Manifest unless laboratory analytical results confirm that the waste exceeds provincial hazardous waste criteria or the waste triggers federal Transport of Dangerous Goods (TDG) Regulations.
- All hydrovac holes shall be adequately backfilled with clean mineral soil or other materials as specified by the owner of the facilities, to ensure settling of material does not pose a hazard for wildlife, livestock or the general public.

4.0 TRENCHLESS CROSSING MANAGEMENT PLAN

4.1 General Measures

1. Ensure that supervisory personnel are aware of this management plan prior to commencement of drilling activity.
2. If water withdrawal is necessary for use on trenchless crossing, ensure that necessary provincial approvals are in place and follow DFO Measures to Protect Fish and Fish Habitat (DFO 2019), as required. Ensure the water source is sampled and analyzed. The Company must approve the water source prior to use of water to make up the drilling fluid.
3. Arrange for access beyond the boundaries of the Project's surface rights agreement along the drill path to monitor, contain and clean-up potential inadvertent drilling fluid releases.
4. Ensure that drilling mud composition is limited to bentonite-based systems (e.g. bentonite, water and industry standard additives) or polymer-based systems (e.g. synthetic or modified natural polymers such as guar gum, xanthan gum, starch, water and industry standard additives). All bentonite- and polymer-based systems shall meet applicable regulatory requirements and shall be limited to those that in its composition and concentration, should an interaction with the environment occur, do not result in a significant adverse effect to the environment. At the Company's request the Contractor shall provide all product Safety Data Sheets (SDSs) and microtox reports for review and approval of the products and/or additives proposed in the drilling system.
5. The Company must approve all drilling mud additives and concentrations prior to use.
6. Construct a sump and berm at the entry and exit points with a capacity adequate to capture anticipated volumes of drilling mud that could be released during pullback and other drilling operations, unless otherwise approved by the Company.
7. Ensure there is sufficient storage capacity (i.e., sumps or tanks) at the entry and exit pads for containment of drilling mud during all drilling operations. If HDD mud sumps are proposed for storage, (i.e. not associated with entry or exit pits) they must be approved by the Company prior to excavation.
8. Develop a clean-up plan, prior to drilling. The plan will be prepared by the drilling contractor in consultation with the Company inspection staff. Acquire the appropriate approvals to access the release area if off the construction footprint and for mud pump-off.
9. Reclaim entry and exit sumps that contained drilling mud immediately after completion of drilling activities to meet equivalent land capability objectives as per the applicable regulatory requirements.

4.2 Emergency Response Equipment

1. The following equipment and supplies shall be onsite in sufficient quantities at the entry and exit points prior to commencement of drilling operations. The equipment and supplies shall be maintained and restocked as required during drilling operations to ensure sufficient quantities are available to contain any inadvertent drilling mud releases:
 - Sandbags, filled;
 - filter cloth (e.g., silt fence);
 - T-bar posts;
 - post pounders;
 - light towers, flashlights or headlamps;
 - shovels;
 - 6 mil polyethylene; and
 - 2-trash pumps c/w sufficient lengths of leak-free hose and suction heads.
2. Vacuum truck(s) shall be onsite during pilot hole, reaming and pullback phases. During the pilot hole phase, when intercept drilling operations are taking place, vacuum trucks shall be located on the entry and exit sides. During reaming and pullback phase, vacuum truck(s) are required on the side to which fluids are returning, at minimum.

3. Maintain the appropriate water quality sampling equipment onsite during drilling operation to ensure that accurate water quality samples can be taken. Onsite equipment to be provided by the Company or their Contractor may include:
 - turbidity meter;
 - sampling pole;
 - chest waders;
 - water sample bottles (approximately 30 - 500 ml bottles);
 - boat; and
 - coolers.
4. Ensure that the water quality sampling program, if implemented, is in place prior to drilling and includes the following information:
 - sample locations (both an upstream control site as well as appropriate downstream sites);
 - frequency of sampling; and
 - sampling procedures.

The program will be amended if warranted by conditions.
5. Ensure that a minimum of three sets of walkie-talkies with spare batteries are onsite and available for use during monitoring operations.

4.3 Monitoring

1. Implement water quality monitoring plans to monitor for sediment events during drilling activities. Water quality monitoring will be used to avoid exceedance of both the Canadian Council of Ministers of the Environment's *Canadian Environmental Quality Guidelines* (CCME 2002) and provincial limits for total suspended solids (TSS), and as early warning signs to potential problems during construction.
2. Supervisory personnel will be onsite at all times during drilling, reaming and pullback operations to ensure that emergency response measures will be implemented immediately and effectively. The Company will also assign inspection personnel to the site during all phases of drilling of the watercourse.
3. Monitor and record annular pressures throughout drilling.
4. Monitor and record the amount of fluid return to the mud tank/pit and the amount of make-up drilling fluid required in the mixing tanks during drilling of the pilot hole and hole opening (reaming). Maintain a detailed log of all drilling activities in order to correlate drilling status with potential inadvertent drilling fluid release events.
5. For the duration of drilling operations, the Contractor will monitor onshore portions of the drill path and surrounding area (i.e., within 50m either side of the drill path) for signs of drilling mud release. The frequency of onshore monitoring will be determined by the Company based on site specific conditions. Onshore monitoring will be conducted and documented by the Contractor. Night-time monitoring will only be conducted beyond the drill path if a loss of circulation is suspected. The Contractor will continue monitoring for at least two hours after pipe pullback is complete. Personnel will be equipped with walkie-talkies to observe and communicate any sign of a release of drilling mud to the surface or in the watercourse. Monitoring walks should be logged and maintained on a tracking list at the drill location and shall be available for review, upon Company request.
6. Ensure that contact is maintained at all times between monitoring and drilling personnel.
7. Where site conditions warrant, establish instream monitoring stations to obtain water samples for visual inspection or turbidity measurement. The number and locations of monitoring stations will be determined by the Company, in consultation with a resource specialist and will vary depending on site-specific water crossing characteristics. The stations could be located approximately at the noted locations and intervals if pressurized drilling fluids or water are used.

Downstream Monitoring Sample Sites (approx.)	Sampling Interval (approx.)
25 m	2 hours
100 m	2 hours
200 m	4 hours
400 m	4 hours

Sampling frequency may be adjusted by the Company, in consultation with a resource specialist. Sampling intervals may increase if monitoring of drilling mud returns indicates that a release may have occurred; and may decrease if site conditions or monitoring to date indicates a lower risk of an inadvertent drilling fluid release.

8. On watercourses with ice cover, onsite conditions may allow visual monitoring of water quality by observing open reaches or, if safe, by augering and maintaining an open hole in the ice for sampling. Supply monitors with practical safety gear (e.g., ropes, ladders, inflatable boat, flotation coveralls) for traversing ice. Continue to evaluate ice conditions throughout the monitoring program.
9. If monitoring reveals sediment values are approaching threshold values, the Environmental Monitors will alert the Environmental Inspector(s) or designate(s) and work with them to develop corrective actions. If corrective actions are not successful, construction activities will be temporarily suspended until effective solutions are identified.
10. If the watercourse is frozen to the bottom, onsite conditions will not allow visual monitoring of water quality by observing open reaches or by augering and maintaining an open hole in the ice for sampling. Continue to visually monitor areas where early detection of an inadvertent drilling fluid release to surface would most likely occur.

5.0 BREEDING BIRD AND NEST MANAGEMENT PLAN

The Breeding Bird and Nest Management Plan (BBNMP) describes the implementation of standard measures employed by TC Energy for reducing the risk of 'incidental take' of birds. Incidental take is the inadvertent disturbance to, or destruction of, a bird or its nest or egg, which for most bird species is a contravention of federal, provincial, and territorial legislation (Environment Canada 2014). The BBNMP is applicable to all TC Energy projects in Canada, although for new infrastructure projects (e.g., new pipelines, new facilities involving wildlife surveys), additional Project-specific BBNMP mitigation measures may be developed in addition to the guidance provided in this plan.

The BBNMP applies to all employees, contractors and consultants who conduct work on behalf of TC Energy during construction. While this plan has been prepared using guidance from Environment and Climate Change Canada (ECCC) regarding the protection of migratory birds, the mitigation measures described below apply to any and all breeding birds.

5.1 Regulations, Guidelines, and Codes of Practice

5.1.1 Federal

There are legal obligations in Canada regarding the protection of migratory birds, as well as select non-migratory birds. The following legislation applies to the protection of birds in Canada:

- *Migratory Birds Convention Act, 1994*
- *Migratory Birds Regulations*
- *Species at Risk Act, 2002*

The *Migratory Birds Convention Act* (MBCA) and the *Migratory Birds Regulation* (MBR) prohibit the disturbance or destruction of migratory birds and their nests and eggs in Canada. "Migratory bird" is defined by Section 2 of the MBCA, and generally includes most migratory species that are native or naturally occurring in Canada (ECCC 2017b). The MBCA and MBR apply to all lands and waters in Canada, regardless of ownership. Environment Canada is responsible for administering the MBCA on behalf of the federal government.

Bird species not covered by the MBCA include grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays, kingfishers, and some species of blackbird. Although not covered by the MBCA, Provincial setbacks or other protection may apply to these birds.

Some bird species, including migratory and non-migratory bird species are protected under the *Species at Risk Act* (SARA). The Species at Risk Public Registry provides the current list of species protected under SARA. It is prohibited to remove the nest of any threatened or endangered species at any time if the species is likely to re-use that nest. ECCC is responsible for administering SARA.

5.1.2 Provincial and Territorial

Provincial and territorial governments share responsibility with ECCC for the management of protected birds in Canada. Bird species not listed under the MBCA and SARA may, or may not, also be protected under provincial or territorial legislation. The following legislation applies to the protection of birds within each jurisdiction:

- *Wildlife Act* (Alberta, British Columbia, Manitoba, Northwest Territories, Nova Scotia, Nunavut, Saskatchewan, Yukon)
- *Fish and Wildlife Act* (New Brunswick)
- *Wild Life Act* (Newfoundland and Labrador)
- *Wildlife Conservation Act* (Prince Edward Island)
- *Fish and Wildlife Conservation Act* (Ontario)
- *An Act Respecting the Conservation and Development of Wildlife* (Quebec)

Provincial or territorial legislation may include year-round protection of inactive nests of some species, and

in some provinces or territories a permit may be required to remove of an inactive nest of certain species. In some jurisdictions, legislation may include species-specific protection, or exemption from protection (e.g., non-native, invasive species).

5.1.3 Guidelines and Codes of Practices

ECCC provides avoidance guidelines to reduce the risk of incidental take of migratory birds and their nests and eggs. ECCC cannot provide authorizations or permits for incidental take. Activities that affect migratory birds or their nests and eggs can result in violations of the MBR. Due diligence and best management practices must be implemented to prevent contravention of federal legislation.

The following information sources were reviewed in the development of the BBNMP, and should be referred to for additional detail in the development of Project-specific BBNMPs:

- Environment Canada's *Avoidance Guidelines* (2017a), and *Guide for Developing Beneficial Management Practices for Migratory Bird Conservation* (2018b).
- Canadian Energy Pipeline Association *Migratory Birds Convention Act: A Best Management Practice for Pipelines* (CEPA 2013).
- Other (e.g., provincial) applicable guidance documents and best management practices.

5.2 Breeding Bird and Nest Management

5.2.1 Breeding Bird General Mitigation and Management

TC Energy is committed to avoiding incidental take of breeding birds. The following guiding principles, as stated by Environment Canada (2014), have been incorporated into the BBNMP:

- *Know your legal obligations;*
- *Avoid engaging in potentially destructive or disruptive activities in sensitive periods and locations in order to reduce the risk of affecting breeding birds; and,*
- *Develop and implement appropriate preventative and mitigation measures to avoid the risk of incidental take and to help maintain sustainable bird populations.*

TC Energy will use the regional nesting zones and nesting periods identified by ECCC to identify the risk of incidental take of migratory birds in Canada (Figure 1). ECCC's nesting calendars identify nesting activity for migratory birds for three broad habitat types: wetland habitat, open habitat, and forest habitat. TC Energy has identified the 'primary nesting period' to be the period when more than 10% of the species within a given regional nesting zone are expected to be breeding, as interpreted from ECCC's nesting calendars (ECCC 2018a). The primary nesting period is the period of time when the risk of incidental take is substantially higher than at other times of the year.

Primary nesting periods for each regional nesting zone in Canada, separated by habitat type, are provided in Figure 2.

Figure 1 Migratory Bird Nesting Zones in Canada

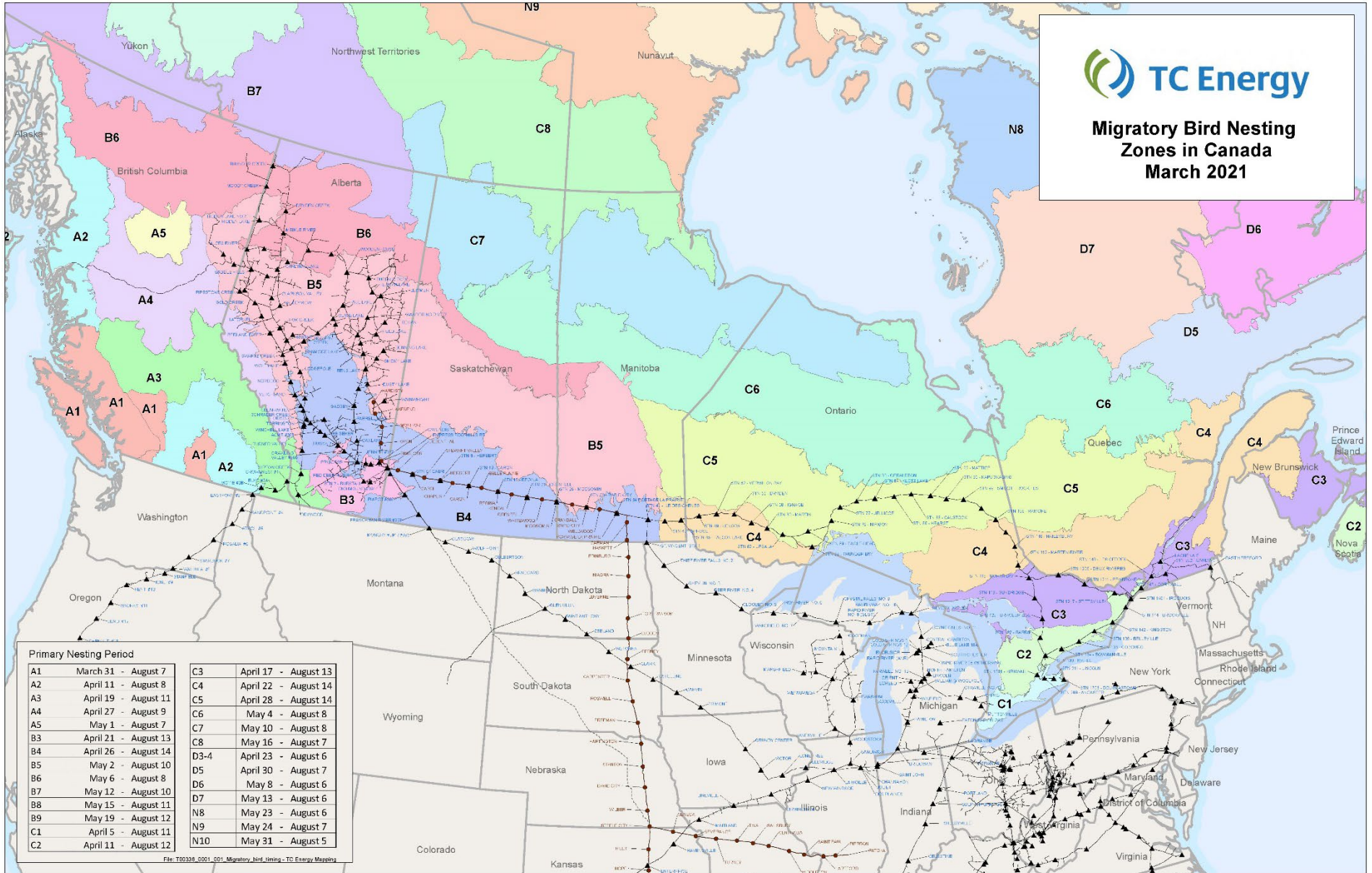


Figure 2 Primary Nesting Periods by Nesting Zone and Habitat Type

Regional Nesting Zone	Wetland Habitat		Open Habitat		Forest Habitat		Consolidated Primary Nesting Period	
	Start	End	Start	End	Start	End	Start	End
A1	March 31	July 29	April 10	August 7	April 2	August 4	March 31	August 7
A2	April 11	July 30	April 23	August 8	April 14	August 5	April 11	August 8
A3	April 19	July 31	April 28	August 11	April 22	August 6	April 19	August 11
A4	April 27	July 31	May 2	August 9	April 29	August 7	April 27	August 9
A5	May 1	August 1	May 5	August 7	May 4	August 7	May 1	August 7
B3	April 21	July 30	April 30	August 13	April 22	August 13	April 21	August 13
B4	April 27	August 3	May 5	August 14	April 26	August 14	April 26	August 14
B5	May 2	August 1	May 6	August 10	May 3	August 10	May 2	August 10
B6	May 6	August 2	May 11	August 4	May 7	August 8	May 6	August 8
B7	May 12	August 4	May 15	August 5	May 12	August 10	May 12	August 10
B8	May 15	August 5	May 17	August 11	May 15	August 7	May 15	August 11
B9	May 19	August 7	May 21	August 12	May 19	August 9	May 19	August 12
C1	April 5	August 7	April 18	August 11	April 10	August 11	April 5	August 11
C2	April 11	August 2	April 22	August 12	April 16	August 10	April 11	August 12
C3	April 17	August 2	April 26	August 13	April 22	August 11	April 17	August 13
C4	April 22	August 1	April 30	August 14	April 25	August 9	April 22	August 14
C5	April 28	August 1	May 6	August 14	April 30	August 11	April 28	August 14
C6	May 4	August 3	May 9	August 4	May 6	August 8	May 4	August 8
C7	May 10	August 4	May 12	August 4	May 10	August 8	May 10	August 8
C8	May 17	August 5	May 20	August 3	May 16	August 7	May 16	August 7
D3-4	April 23	July 30	April 30	July 31	April 25	August 6	April 23	August 6
D5	April 30	August 1	May 7	August 1	May 1	August 7	April 30	August 7
D6	May 8	August 3	May 15	August 2	May 10	August 6	May 8	August 6
D7	May 13	August 5	May 19	August 3	May 15	August 6	May 13	August 6
N8	—	—	May 23	August 6	—	—	May 23	August 6
N9	—	—	May 24	August 7	—	—	May 24	August 7
N10	—	—	May 31	August 5	—	—	May 31	August 5

Source: Environment and Climate Change Canada 2018a.

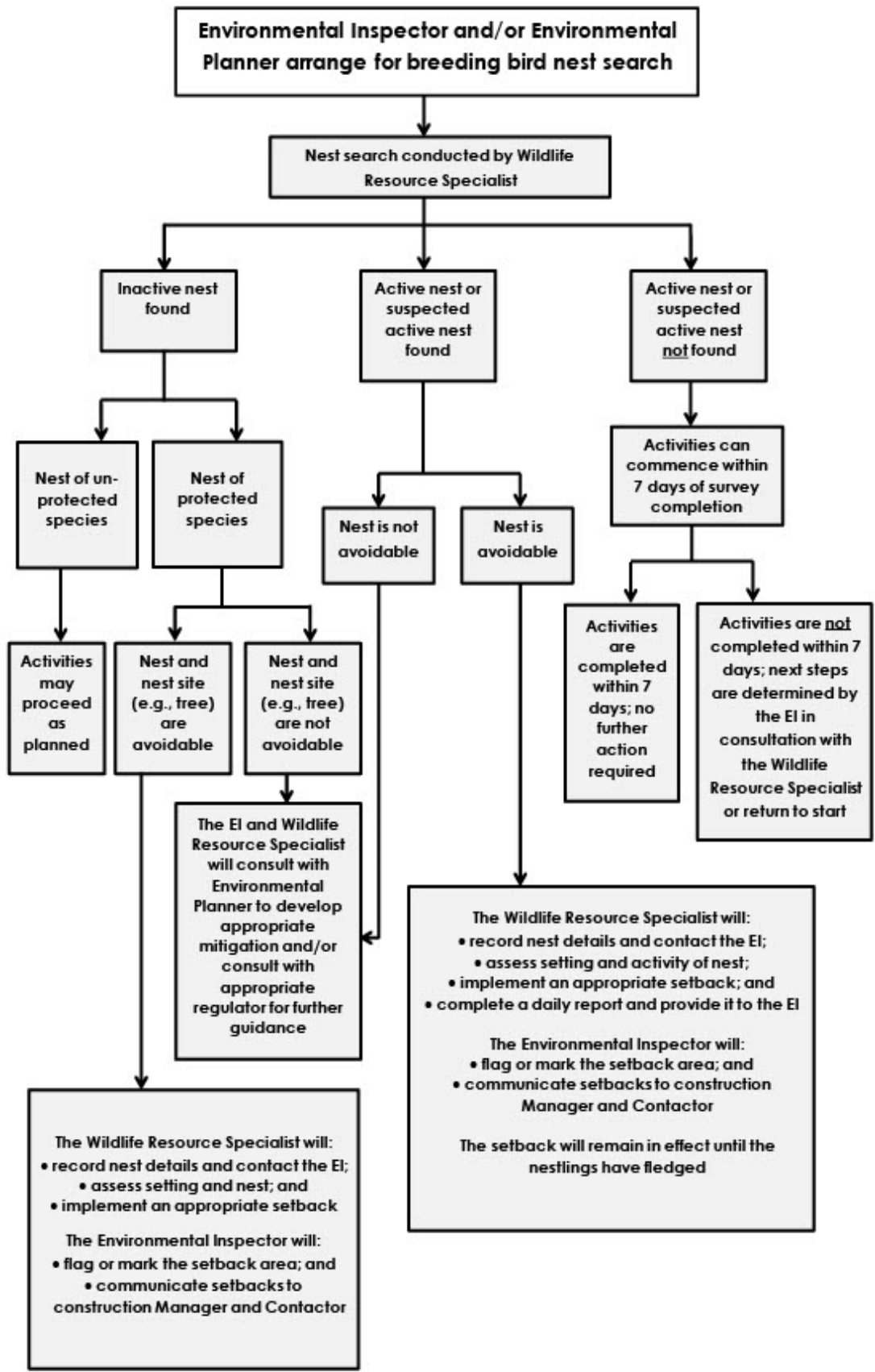
Potentially destructive or disruptive activities should be scheduled to occur outside of the regional nesting zone's primary nesting period, to the extent practicable. However, avoidance of the primary nesting period must be considered in a broader context and balanced with other environmental considerations (e.g., beneficial timing for soil conservation, restricted activity periods for fish and other wildlife species in the Project area, etc.). Examples of where it may not be practicable to avoid the primary nesting period include routine maintenance of facilities for safe operation, emergency response, and geophysical, habitat, or climatic constraints related to construction or maintenance activities.

In the event that clearing or construction activities cannot be avoided during the migratory bird primary nesting period, non-intrusive methods should be used to conduct an area search for evidence of nesting birds within seven days of activities that are scheduled to occur. The process to be followed in the event that a migratory bird nest search is warranted is outlined in Figure 3.

In some circumstances, depending on the intensity of the activity to be conducted and the presence of other mitigating factors (e.g., existing disturbance in the Project area), a non-intrusive nest search completed by a Wildlife Resource Specialist may not be warranted. A decision to modify the nest search requirements will be made by the Environmental Inspector or Environmental Planner in collaboration with the Project Manager, and the determination will be made following a risk assessment considering the intensity and duration of the proposed activity, habitat type, and the potential for incidental take.

Outside of the primary nesting period (i.e., when 10% or less of species in a regional nesting zone are breeding), a search for migratory bird nests is generally not required, unless recommended on a Project-specific basis. Any discoveries of active or protected nests will be documented and mitigated through the TC Energy Wildlife Species of Concern Discovery Contingency Plan. A Wildlife Resource Specialist will be consulted for additional guidance as needed.

Figure 3 Breeding Bird Nest Search



6.0 ACCESS MANAGEMENT PLAN

The Access Management Plan (AMP) is intended to work in coordination with the Environmental Protection Plan (EPP) and other management plans in the EPP. Access management planning will occur prior to the project construction phase with minor adjustments potentially required during construction to address unforeseen site conditions. The specific measures in the plan will typically be completed during the final cleanup stage of the project construction phase. Should trenchless techniques be prescribed, they will be executed at the appropriate time of the construction phase. This will ensure the intent of the plan is achieved and potential elements such as limited clearing or no clearing and access management are addressed.

Access management is not applicable where it cannot be effective, such as where cleared linear features are constructed adjacent to one another. Placing access management measures on a project right-of-way (RoW) adjacent to pre-existing or maintained industrial clearings or other linear developments that have no measures in place would be ineffective as an access deterrent.

Access management is an established method for minimizing new access to an area. Access management is a requirement and key element of applicable federal and provincial guidelines.

The Environmental Inspector(s) or designate(s) are responsible for ensuring implementation of the plan and compliance with TC Energy's environmental guidelines and all applicable codes, regulations and industry standards.

6.1 Purpose

The purpose of the Access Management Plan is to provide guidance and measures for managing motorized human access for the Project in areas where new or expanded human access has been identified as potentially disruptive to the habitat, behaviour, and populations of wildlife species and pre-existing traditional land use practices. Project construction and associated traffic are relatively short-term activities, however long-term access to an area can result in enduring effects to the local area as a result of human access.

Access management will be designed to deter human motorized access along the Project rights-of-way, with the objectives of maintaining access levels at or near preconstruction conditions and ensuring effectiveness of individual access management measures.

6.2 Goals and Objectives of the Access Management Plan

The goals of the AMP are to:

1. Implement access management measures where applicable to deter an increase in motorized public access:
 - along new pipeline rights-of-way,
 - on new temporary construction access,
 - into existing linear disturbances that intersect the Project right-of-way;
2. Maintain accessibility necessary for safe pipeline and facility operations and be compliant with applicable regulations and guidelines; and
3. Maintain existing access at locations identified during the project consultation and planning stage. This includes disturbances and/or dispositions that are or could be utilized by others.

The goals and objectives of the AMP will be achieved by identifying areas that require access management along the Project right-of-way and temporary construction access, and implementing the appropriate site-specific measures. Emphasis for access management will be placed on areas of intersecting open disturbance (e.g., existing rights-of-way, seismic lines and roads), non-contiguous segments of the pipeline rights-of-way, new temporary construction access and areas sensitive to increased access.

The access management measures will be monitored as a component of Post-Construction Reclamation Monitoring (PCRM), and adaptive management will occur where appropriate if objectives are not being achieved. The objectives of monitoring access management are to:

1. Determine pre-construction levels of access along the proposed right-of-way;

2. Determine the effectiveness of access management measures for the Project by evaluating post-construction access levels with pre-construction conditions and previous monitoring;
3. Identify access management measures or locations that are ineffective, and determine contingency measures to supplement or replace measures found to be ineffective.

6.3 Selection of Access Management Measures and Locations

A combination of one or more measures selected from Table 2 will be implemented to achieve the goals and objectives of access management. Selection of access management locations will focus on areas where the measures have the possibility to be effective. Locations and type of measures for access management will be refined based on factors such as availability of access management measures construction material and storage space.

Potential locations where access management strategies could be implemented will be determined during project planning and will consider the following:

- segments of the right-of-way that deviate from paralleling existing linear features (i.e., non-contiguous), temporary access (i.e., shoo-flies) and false rights-of-way used to string pipe at trenchless crossings are priority areas for access management measures;
- intersections of the Project footprint with other linear features (i.e. roads) where trenchless crossing methods may be extended to retain intact vegetation, and where construction access may be limited or where alternate access may be used;
- areas that are accessible to restoration crews and equipment;
- locations where suitable material is available for rollback or berms;
- locations where construction requirements allow and where trees are present along the edge of the right-of-way, which may be felled over the right-of-way following construction;
- soil characteristics that are conducive to mounding; and
- upland, well-drained sites that are conducive to seedling planting and establishment.

6.3.1 Timber Utilization, Fire and Forest Health

The selection of access management measures considers commercial forestry (timber utilization) and fire and forest health values, as woody debris rollback in targeted areas is one of the most practicable and widely used techniques for managing access on pipeline rights-of-way.

6.4 Access Management Measures

Table 2 provides a summary of potential access management measures that may be applied to linear developments, and includes available information on type and implementation specifications. The mitigation type selected will be based on site specific conditions, e.g. the availability of timber or brush for roll-back or slash berms (i.e. may be limited or unavailable in some project areas). Existing site conditions will be taken into consideration during access management planning. A combination of short and long-term measures that can effectively achieve access management goals and objectives can be implemented.

The following table provides a list of access management options which are not project specific, but may be applicable depending on local site conditions. Site specific opportunities for access management not found in Table 2 may be identified during planning and/or construction and will be evaluated on their merits with respect to access management goals and objectives. The access management measures that are selected to meet the objectives will be applied in consultation with the applicable regulator.

Table 2 Potential Access Management Measures

Type of Measure	Specifications	Comments
Minimal surface disturbance	<ul style="list-style-type: none"> • Width of grubbing is limited to the trench area and where grading is required, and reduces the need for soil salvage over wider areas of the footprint • In non-frozen ground conditions, and where indicated in project specific documentation, minimize disturbance (e.g. limit traffic) beyond the stripped areas prior to pipe handling activities • Reduces disturbance to vegetation and root systems by cutting, mowing or walking down; mulching stumps, shrubs and trees that are non-merchantable at ground level (mulch depths maximum 5 cm), and limiting traffic to stripped areas. Intact root systems and seed bed can facilitate rapid regeneration of vegetation • Within riparian areas surrounding watercourse crossings (i.e. designated buffer zone), mulching is not permitted unless approved by the Company • Beyond the ditchline area, work on top of mulch layer where possible. This is achieved by freezing in mulch and allowing a layer of packed snow or ice to form grade level of RoW, using frost induction techniques (i.e. watering, utilizing snow, dragging tires, snow making) to form a protective layer where travel can be accommodated 	<ul style="list-style-type: none"> • The objective is to minimize impacts on the soils and vegetation substructure, with the goal of allowing the Project footprint to re-vegetate to a similar pre-construction condition, subject to land-use guidelines specific to the disposition • May be limited to construction during winter conditions, constrained by existing ground topography and to areas where grading isn't required • In site specific circumstances and conditions, matting may be appropriate for short distances to meet the intent of this measure • Minimal surface disturbance construction methods reduce impacts to soil structure and leads to the rapid regeneration of native vegetation. This method aids in achieving the goal of access control
Snow ramping	<ul style="list-style-type: none"> • Trees and shrubs are walked down using construction equipment and piled with layers of snow to create a ramp for vehicle traffic, if there is enough snow cover during winter construction. • Small coniferous trees can also be walked down, but only in years when there is a higher than normal snow fall. When the snow melts in the spring following construction, the trees and shrubs recover their original configuration and create access control 	<ul style="list-style-type: none"> • Snow ramping can be combined with some elements of Minimal Surface Disturbance, with the intent to minimize disturbance to small shrubs and understory, thereby encouraging the trees and shrubs to recover to a level similar to their original shape and create access control and provide habitat. • Snow making may be required in site specific circumstances to address the intent of this measure
Trenchless construction techniques	<ul style="list-style-type: none"> • Trenchless construction techniques (e.g., bore) are used to install pipe under transecting disturbances (e.g., watercourses, roads, third party utility rights-of-way) 	<ul style="list-style-type: none"> • Extending these types of crossings in some cases may provide opportunities to retain natural vegetation screens that block access between the right-of-way and the intersecting disturbance

Type of Measure	Specifications	Comments
Woody debris rollback	<ul style="list-style-type: none"> • Rollback density should be approximately 200–300 m³/ha. Lengths of 50 – 100 m have been found to be sufficient to deter access and will also allow space between the debris to facilitate seedling planting. Location and extent of rollback is subject to availability of appropriate material • Woody debris should be spread evenly and must extend across the entire footprint width (i.e. no gaps between edge of standing timber and tops/ butt of the placed rollback) at a coverage/ density that will not restrict the ability to plant seedlings or limit planted or natural seedling growth • Utilization of merchantable quality timber requires approval from the applicable regulator. • The placement of woody debris needs to consider risks from a forest fire perspective • Rollback can be implemented in isolation or in combination with other treatments (e.g., rollback combined with signs or with revegetation measures such as seeding or planting) 	<ul style="list-style-type: none"> • Rollback can be effective immediately following implementation, provided adequate material is available and properly applied (Vinge and Pyper 2012). Long rollback segments are more effective at managing access because ATV riders will be less inclined to try to ride through the debris or traverse around it in adjacent forest stands • Placement of woody debris rollback can conserve soil moisture, moderate soil temperatures and provide nutrients as debris decomposes, prevent soil erosion, provide microsites for seed germination and protection for planted tree seedlings (Pyper and Vinge 2012; Vinge and Pyper 2012) • Fire risk can be minimized through proper storage and placement of materials (Pyper and Vinge 2012). A 25 m rollback-free fuel break placed at 250 m intervals along rollback segments is recommended by the Integrated Standards and Guidelines for the Enhanced Approval Process (AER 2013)
Mounding	<ul style="list-style-type: none"> • Mounding involves the excavation and inversion of soil beside the hole, and capping with a layer of mineral soil. This treatment creates a mosaic of high and low-lying areas • For access management purposes, mounds should be created using an excavator. Excavations are typically 0.75 m deep 	<ul style="list-style-type: none"> • In addition to access management, mounding can create suitable microsites for revegetation
Berms	<ul style="list-style-type: none"> • Berms may be constructed of slash and timbers. Supported berms resemble log fences or walls, constructed using timber cleared from the right-of-way • To be effective, berms should be constructed to an approximate height of 2 m 	<ul style="list-style-type: none"> • Promote rapid shrub/tree regeneration at ends of berms (e.g., bio-engineering, seedling planting) to increase effectiveness as access management

Type of Measure	Specifications	Comments
Tree felling	<ul style="list-style-type: none"> Tree felling is the process of deliberately cutting trees at the margin of a clearing to fall over the linear disturbance. Trees are felled from both sides of the linear disturbance to create access control. It may be applicable in specific locations where adjacent trees are tall enough to cover the entire width of the RoW 	<ul style="list-style-type: none"> Tree felling requires simpler site requirements than rollback and less specialized equipment than mounding Tree felling can promote natural revegetation by increasing cone deposition onto the ROW, creating microsites through shading and dropped dead woody debris, and protecting planted seedlings from extreme weather, wildlife trampling and damage from access
Bio-engineering and shrub staking	<ul style="list-style-type: none"> Bio-engineering is the use of live vegetation to stabilize and revegetate a site (e.g., transplants; installing cuttings), and is a technique often used on slopes or riparian banks Vegetation used for bio-engineering is either found at the site to be treated, or collected nearby in the form of cuttings Species are determined based on the biophysical characteristics of the site, adjacent forest stand composition, and restoration objectives (e.g., low palatability for ungulates) Planting densities depend on several factors, including habitat type (upland, riparian, wetland), ecosystem, tree/shrub species and minimum density target Planting is conducted in non-frozen ground conditions, and in the season following winter final cleanup 	<ul style="list-style-type: none"> Species and planting densities used for bio-engineering are site dependent Nursery-grown shrub seedlings may be planted where staking is not practicable due to lack of available material, limitations associated with collecting material off-site, or where restoration prescription calls for shrub planting of species that do not readily regenerate through cuttings/staking (e.g., alder) Conifer seedling planting is considered an effective access control measure (effectiveness is expected to take longer than 10 years)
Transplanting	<ul style="list-style-type: none"> Transplanting involves moving transplantable vegetation (e.g. small trees and shrubs) from off RoW to the RoW as a vegetation access management measure 	<ul style="list-style-type: none"> Transplanting has the advantage of immediately establishing relatively large trees/shrubs (e.g., saplings) and providing immediate-term access management Transplanting programs often result in the storage of plant materials under less-than-ideal conditions due to seasonal factors (i.e., extreme weather). Other access management options such as seedling planting have been shown to be more successful Limitations to implementation of transplanting include inconsistent availability of vegetation suitable for transplant, and the potential for degradation of neighbouring vegetation communities if transplants are sourced from adjacent tree stands

Type of Measure	Specifications	Comments
Gates and fencing	<ul style="list-style-type: none"> • Gates or fencing can be placed at the start of new permanent roads to restrict unauthorized, motorized access • Gates and fencing should be extended across the right-of-way to prevent motorized vehicles from circumnavigating the barrier 	<ul style="list-style-type: none"> • Gates allow access by authorized individuals for operations and maintenance • Signage may be implemented in conjunction with gates to explain the purpose of access restrictions
Signs	<ul style="list-style-type: none"> • Signs may be installed at potential access points to explain why motorized access is being managed in the area, as well as why the restrictions are in place 	
Road deactivation	<ul style="list-style-type: none"> • Road deactivation involves ripping the roadbed, removal of stream crossing structures, recontouring cut and fill slopes and re-establishing native vegetation to entirely eliminate the roadbed • Reclamation of the treated road surface should occur as part of the road deactivation process 	

6.5 Access Management Measures Monitoring

Access management monitoring will be conducted concurrently with PCRMR and may be combined with operational or maintenance activities, such as corrosion or leak detection surveys and pipeline surveillance flights, where opportunities exist.

6.5.1 Monitoring Implemented Access Management Measures

Aerial overflights and ground surveys are methods that could be used to check the integrity of access management measures, identify evidence of motorized access, and identify changes in land use and new development that may affect access management on the Project right-of-way. Surveys are intended to provide evidence that a specific access management measure was (or was not) effective. The principle of continual improvement will be used to refine access management in order to see improving access management results.

6.5.2 Reporting Implemented Access Management Measures

The access management measures described in this management plan will be monitored and communicated via reporting to applicable regulators during the post construction reclamation monitoring phase.

APPENDIX 1G

REGULATIONS, GUIDELINES AND INDUSTRY BEST PRACTICES

Regulations, guidelines, and industry best practices have been considered in the creation of this EPP. This includes, but is not limited to:

Federal

- *Canadian Energy Regulator Act, 2019*, regulations, and guidelines;
- *Impact Assessment Act, 2019*;
- *Canadian Navigable Waters Act, 1985*;
- *Migratory Birds Convention Act, 1994*, schedules and regulations;
- *Species at Risk Act*, regulation, policies and guidelines;
- *Fisheries Act*, regulations, and guidelines, including;
 - Fisheries and Oceans Canada (DFO) Measures to Protect Fish and Fish Habitat;
 - DFO Standards and Codes of Practice:
 - Code of Practice: Beaver Dam Breaching and Removal;
 - Code of Practice: Culvert Maintenance;
 - Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater;
 - Code of Practice: Temporary Cofferdams and Diversion Channels;
 - Code of Practice: Clear Span Bridges; and
 - Code of Practice: Ice Bridges and Snow Fills.
- *Transportation of Dangerous Goods Act, 1992*, and regulation;
- *Canadian Environmental Protection Act, 1999* and regulations.

Alberta

- *Water Act*, regulations, codes of practice, and guidelines, including:
 - Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body;
 - Code of Practice for Watercourse Crossings;
 - Alberta Wetland Policy.
- *Public Lands Act* and guidance documents, including:
 - Alberta Government Master Schedule of Standards and Conditions.
- *Forests Act* and regulations;
- *Forest and Prairie Protection Act*;
- *Wildlife Act*, and regulation;
- *Historical Resources Act*;
- *Environmental Protection and Enhancement Act* and regulations; and
- applicable Alberta Energy Regulator Directives.

**Revised Attachment 8-2:
Environmental Site Information Sheets**

NOTES:

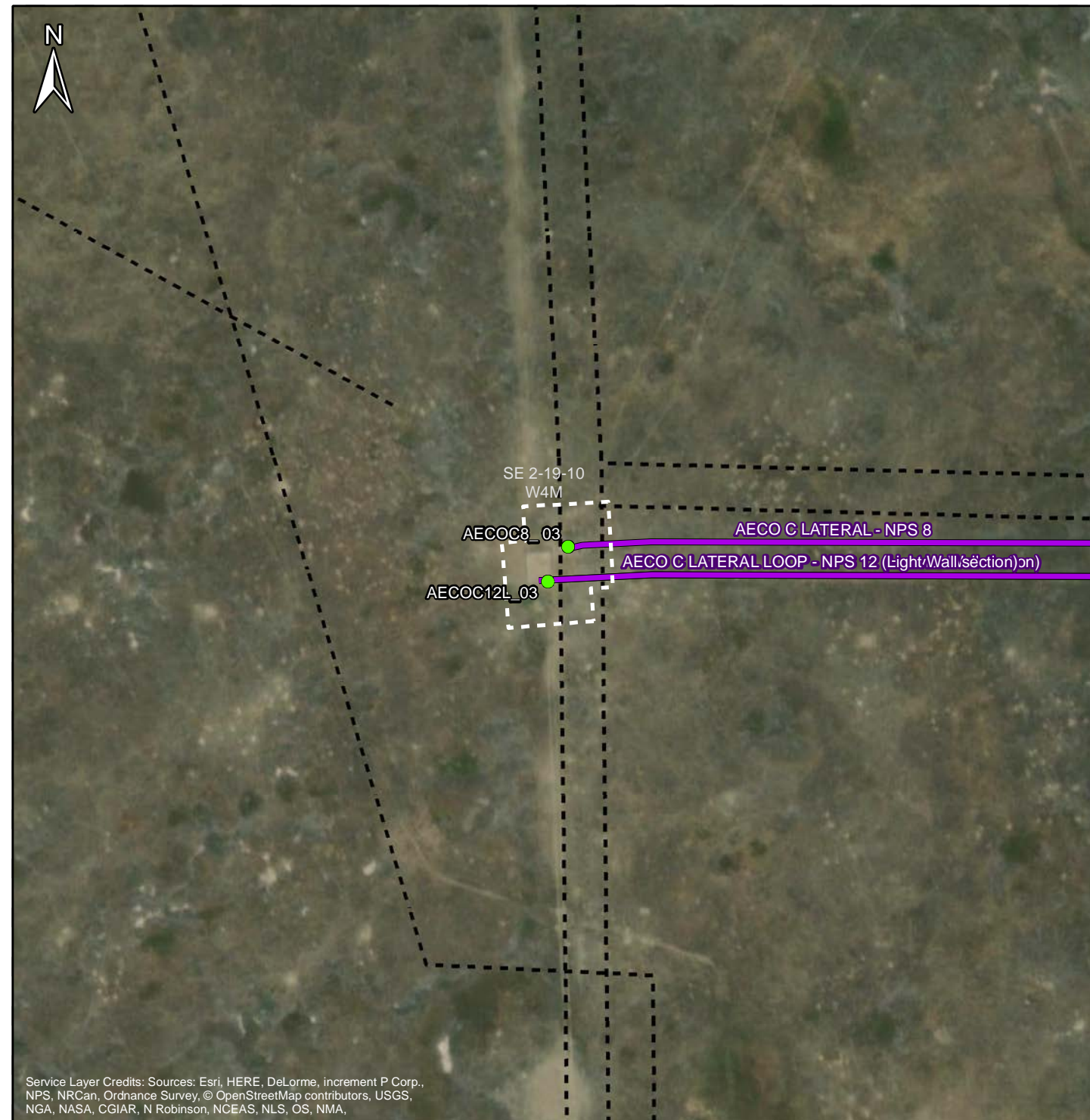
These Environmental Site Information Sheets (ESIS) are intended to be used in conjunction with the Program-specific Environmental Protection Plan (EPP). Measures outlined in the ESIS are site-specific measures to address specific environmental features and are not a comprehensive list of all measures to be applied. Refer to the EPP for additional general measures for the Program. The following measures are applicable to all PDAs:

Soil Handling / Soil Salvage Depth and Criteria	<ul style="list-style-type: none"> • Should Program traffic or other Program activity disturb the topsoil/strippings piles and there is a potential for wind erosion, apply additional water and/or tackifier, if warranted. • In the event of adverse weather that could result in rutting, sedimentation and erosion, and/or compaction, the Environmental Inspector(s) or designate(s), in consultation with the Construction Manager, may implement contingency measures as outlined in the Adverse Weather Contingency Plan (Appendix 1E of the EPP). A soils specialist and/or the responsible regulatory agency may be consulted, if warranted. • Where soil stripping is required: <ul style="list-style-type: none"> • Stripping depth will be determined by the Environmental Inspector(s) or designate(s) based on site-specific conditions. Assume salvage depth is approximately 10-15 cm. • Strip full area required for isolation and/or other facilities removal. • If stripped, topsoil/strippings will be stockpiled and re-used for site reclamation. • The strippings will be stockpiled in a designated location, in a manner that will not cause erosion or sedimentation. • Where native grassland is identified, site specific mitigation and reclamation measures will be implemented as per Section 7.0 of the EPP.
Watercourses	<ul style="list-style-type: none"> • Prohibit clearing within a 10 m (minimum) riparian buffer from top of bank of the watercourse unless otherwise approved by the Environmental Inspector(s) or designate(s). This area shall be clearly marked prior to clearing. • Access to the PDAs will use existing roads, trails, utility ROWs and NGTL ROWs where possible. However, the construction of new temporary access may be required. Temporary vehicle crossings at watercourses (e.g., matting, clear span bridges, ice bridges, snowfills, other temporary structures) may be required. When access plans have been confirmed, NGTL will conduct a desktop review and field studies, if necessary, apply any necessary mitigation measures as detailed in the EPP, and obtain any necessary permits or authorizations prior to Program abandonment activities.
Vegetation	<ul style="list-style-type: none"> • Avoid disturbance to environmentally sensitive features during clearing as identified by the appropriate signage and/or fencing. The Environmental Inspector(s) or designate(s) and appropriate Environmental Resource Specialist will determine the size of avoidance buffer surrounding these features, if appropriate. • If previously unidentified rare plants or rare ecological communities are found on the PDA prior to or during activities, implement the Plant Species and Ecological Communities of Concern Discovery Contingency Plan (Appendix 1E of the EPP). • In lands with infestations of noxious or prohibited noxious weeds (whether discovered before or during physical abandonment activities), record locations for follow-up with treatment and monitoring, as approved by the Environmental Inspector(s) or designate(s). • Follow general weed mitigation measures outlined in Section 8.1 of the EPP.
Wetlands	<ul style="list-style-type: none"> • The Company will obtain regulatory approval for construction activities occurring within wetlands, as required. Construct the wetland crossings in accordance with the applicable regulatory requirements. • Refer to Sections 7 and 8 of the EPP for additional mitigation measures for wetlands. • Avoid disturbance to environmentally sensitive features during clearing as identified by the appropriate signage and/or fencing. The Environmental Inspector(s) or designate(s) and appropriate Environmental Resource Specialist will determine the size of avoidance buffer surrounding these features, if appropriate. • Following clearing, re-mark all sensitive resources as necessary and supplement markings with signage. • Shallow groundwater may be present in excavation/trench. Follow procedures for management of excavation/trench water outlined in Sections 8.1 and 8.5 of the EPP.
Wildlife	<ul style="list-style-type: none"> • If physical abandonment activities (including clearing and reclamation) are scheduled to commence during the raptor nesting period, migratory bird Primary Nesting Period (PNP) and the extended period for bird species at risk (March 15 to August 31, inclusive) (ECCC 2018a; Gregoire 2020, pers. comm.; GOA 2021), refer to the Breeding Bird and Nest Management Plan (Appendix 1F of the EPP). • In the event an active nest is found or breeding behaviour is observed, it will be subject to site-specific mitigation measures (i.e., clearly marked protective buffer around the active nest and/or non-intrusive monitoring) based on the Breeding Bird and Nest Management Plan (Appendix 1F of the EPP). • Report sightings of Project-specific wildlife species of concern to the Environmental Inspector(s) or designate(s). Specific protection measures may be implemented and the sighting will be recorded. • If previously unidentified listed or sensitive wildlife species or their site-specific habitat (e.g., dens, nests) are identified during physical abandonment activities, report to the Environmental Inspector(s) or designate(s) and implement the Wildlife Species of Concern Discovery Contingency Plan (Appendix 1E of the EPP). • Refer to Wildlife Species at Risk and Species of Concern Table on Page 2 for a list of the PDAs within mapped species ranges. • Refer to Sections 7 and 8 of the EPP for additional mitigation measures for wildlife and wildlife habitat.
Historical or Heritage Resources and Palaeontological Resources	<ul style="list-style-type: none"> • Historical Resources Act (HRA) clearance from Alberta Culture will be received prior to physical abandonment activities, where required. Approval conditions are expected to align with the Cultural Resource Discovery Contingency Plan (Appendix 1E of the EPP). • If historical or palaeontological features (e.g., arrow heads, modified bone, pottery fragments, fossils) not previously identified are found on the PDA during abandonment activities, implement the measures outlined in the Cultural Resource Discovery Contingency Plan (Appendix 1E of the EPP).
Traditional Land and Resource Use	<ul style="list-style-type: none"> • If Traditional Land and Resource Use (TLRU) sites not previously identified are found on the construction footprint during construction, implement the Cultural Resource Discovery Contingency Plan (Appendix 1E of the EPP).
Site Contamination Consideration	<ul style="list-style-type: none"> • Purge and clean the pipeline segments to be abandoned prior to isolation or other physical abandonment activities. • In the event of a spill, refer to the Release Contingency Plan (Appendix 1E of the EPP).
Reclamation	<ul style="list-style-type: none"> • Natural recovery is the preferred method of reclamation in non-agricultural areas on level terrain where erosion is not expected. Where natural recovery is not preferred, seed disturbed areas as per site requirements and as specified by the Environmental Inspector(s) or designate(s). • Seed mix, if used, will be determined as directed by the relevant regulatory authority or based on input from the landowner, as applicable. • Use a cover crop to assist in weed and erosion control where warranted, or where requested by the landowner. Apply cover crops to the approach slopes of all water crossings where there is a risk of wind and water erosion. • Where the pipe or a facility has been removed, acquire an appropriate volume of fill to replace the void, as required. Fill material must be clean, free of weeds, match surrounding soil texture and be approved in accordance with Company requirements prior to use. • Refer to Section 8.7 of the EPP for a complete listing of reclamation requirements.

TABLE: Wildlife Species at Risk or Species of Management Concern

The following table lists the PDAs that are within mapped ranges of wildlife Species at Risk or Species of Concern. Refer to the EPP for standard and site-specific mitigation measures applicable to wildlife species.

Common Name	Taxon	SAR Status	PDAs in Mapped Range
Bank Swallow	Birds	Threatened	All PDAs
Barn Swallow	Birds	Threatened	All PDAs
Burrowing Owl	Birds	Endangered	AEC01, AEC04, AEC06, LOU01.2, LOU02, LOU07, SCO01, SCO03, TID01, TID02, TID03, TID04, TIL01, TIL03
Canada Warbler	Birds	Threatened	KEH01, KEM01, LEN02, LEN08, OSB02, OSB03, OSB04 , OSB05, OSB06, ROC01, ROC03, ROC03.5, ROC04, UKA01, UKA02, UKA03, UKA04, UKA04.5 , UKA06, UKA07, UKA08, UKA09, UKA10, UKA11, UKA12, UKA13, UKA14, UKA15, UKA17, UKA18, UKA19, UKA20, WEA01, WEA03, WEA04, WHI01, WHI03, WHI05, WHI06
Chestnut-collared Longspur	Birds	Threatened	AEC01, AEC04, AEC06, BAI01, LOU01.2, LOU02, LOU07, SCO01, SCO03, TID01, TID02, TID03, TID04, TIL01, TIL03
Common Nighthawk	Birds	Threatened	All PDAs
Ferruginous Hawk	Birds	Threatened	AEC01, AEC04, AEC06, BAI01, LOU01.2, LOU02, LOU07, SCO01, SCO03, SED01, TID01, TID02, TID03, TID04, TIL01, TIL03
Grasshopper Sparrow, pratensis subspecies	Birds	Special Concern	AEC01, AEC04, AEC06, BAI01, LOU01.2, LOU02, LOU07, SCO01, SCO03, SED01, TID01, TID02, TID03, TID04, TIL01, TIL03
Great Plains Toad	Amphibians	Special Concern	AEC01, AEC04, AEC06, LOU01.2, LOU02, LOU07, TID01, TID02, TID03, TID04, TIL01, TIL03,
Loggerhead Shrike Prairie subspecies	Birds	Threatened	AEC01, AEC04, AEC06, BAI01, BRU01, BRUN01, BRUN04, BRUN05, LOU01.2, LOU02, LOU07, MIN02, MIN05, MIN06 , MIN08, RAN01, RAN02, RAN02.5 , RAN03, SCO01, SCO03, SED01, TID01, TID02, TID03, TID04, TIL01, TIL03, VIK01, VIK04, VIK07
Long-billed Curlew	Birds	Special Concern	AEC01, AEC04, AEC06, BAI01, LOU01.2, LOU02, LOU07, SCO01, SCO03, TID01, TID02, TID03, TID04, TIL01, TIL03
McCown's Longspur	Birds	Special Concern	AEC01, AEC04, AEC06, BAI01, LOU01.2, LOU02, LOU07, SCO01, SCO03, TID01, TID02, TID03, TID04, TIL01, TIL03
Northern Leopard Frog (Western Boreal/Prairie populations)	Amphibians	Special Concern	AEC01, AEC04, AEC06, BAI01, LOU01.2, LOU02, LOU07, SCO01, SCO03, TID01, TID02, TID03, TID04, TIL01, TIL03
Olive-sided Flycatcher	Birds	Threatened	All PDAs
Piping Plover circumcinctus subspecies	Birds	Endangered	BAI01, BRU01, BRUN01, BRUN04, BRUN05, KEH01, MIN02, MIN05, MIN06 , MIN08, RAN01, RAN02, RAN02.5 , RAN03, SCO01, SCO03, SED01, TIL01, TIL03, UKA01, UKA04, UKA04.5 , UKA06, UKA07, UKA08, UKA09, UKA10, UKA11, UKA12, UKA13, UKA14, UKA15, UKA17, UKA18, UKA19, UKA20, VIK01, VIK04, VIK07, WHI01, WHI03, WHI05, WHI06
Rusty Blackbird	Birds	Special Concern	All PDAs
Sage Thrasher	Birds	Endangered	LOU01.2, LOU02, LOU07, TIL01, TIL03
Short-eared Owl	Birds	Special Concern	All PDAs
Sprague's Pipit	Birds	Threatened	AEC01, AEC04, AEC06, BAI01, BRU01, BRUN01, BRUN04, BRUN05, LOU01.2, LOU02, LOU07, MIN02, MIN05, MIN06 , MIN08, RAN01, RAN02, RAN02.5 , RAN03, SCO01, SCO03, SED01, TID01, TID02, TID03, TID04, TIL01, TIL03, UKA01, UKA04, UKA04.5 , UKA06, UKA07, UKA08, UKA09, UKA10, UKA11, UKA12, UKA13, UKA14, UKA15, UKA17, UKA18, UKA19, UKA20, VIK01, VIK04, VIK07, WHI01, WHI03, WHI05, WHI06
Swift Fox	Mammals	Threatened	AEC01, AEC04, AEC06, LOU01.2, LOU02, LOU07, TID01, TID02, TID03, TID04, TIL01, TIL03
Western Grebe	Birds	Special Concern	AEC01, AEC04, AEC06, BAI01, BIG02, BIG03, BIG04, BIG07, BIG08, BIG10, BIG10.5, BIG12, BIG12.5 , BRUN01, BRUN04, BRUN05, KEH01, LOU01.2, LOU02, LOU07, MIN02, MIN05, MIN06 , MIN08, OSB02, OSB03, OSB04 , OSB05, OSB05.5, OSB06, PIO01, PIO03, PIO03.5 , PIO08, RAN01, RAN02, RAN02.5 , RAN03, ROC01, ROC03, ROC03.5, ROC04, SCO01, SCO03, SED01, TID01, TID02, TID03, TID04, TIL01, TIL03, UKA01, UKA04, UKA04.5 , UKA06, UKA07, UKA08, UKA09, UKA10, UKA11, UKA12, UKA13, UKA14, UKA15, UKA17, UKA18, UKA19, UKA20, VIK01, VIK04, VIK07, WHI01, WHI03, WHI05, WHI06
Western Painted Turtle (Intermountain - Rocky Mountain population)	Reptiles	Special Concern	BAI01
Western Tiger Salamander (Prairie / Boreal population)	Amphibians	Special Concern	AEC01, AEC04, AEC06, BAI01, BRU01, BRUN01, BRUN04, BRUN05, KEH01, LOU01.2, LOU02, LOU07, MIN02, MIN05, MIN06 , MIN08, RAN01, RAN02, RAN02.5 , RAN03, SCO01, SCO03, SED01, TID01, TID02, TID03, TID04, TIL01, TIL03, UKA01, UKA04, UKA04.5 , UKA06, UKA07, UKA08, UKA09, UKA10, UKA11, UKA12, UKA13, UKA14, UKA15, UKA17, UKA18, UKA19, UKA20, VIK01, VIK04, VIK07, WHI01, WHI03, WHI05, WHI06
Western Toad	Amphibians	Special Concern	BIG02, BIG03, BIG04, BIG07, BIG08, BIG10, BIG10.5, BIG12, BIG12.5, JOS02, JOS04, MAD01, PIO01, PIO03, PIO03.5, PIO08, SIL01, SIL04, SIL04.5, SIL09, SIM01, SIM02
Wolverine	Mammals	Special Concern	BIG02, BIG03, BIG04, BIG07, BIG08, BIG10, BIG10.5, BIG12, BIG12.5 , JOS02, JOS04, KEM01, LEN02, LEN08, MAD01, SIL01, SIL04, SIL04.5, SIL09, SIM01, SIM02
Woodland Caribou (Boreal population)	Mammals	Threatened	KEM01, LEN02, LEN08, MAD01, SIM01, SIM02,
Yellow Rail	Birds	Special Concern	All PDAs

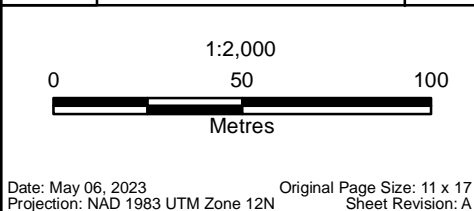


PROGRAM COMPONENT	AECOC12L_03, AECOC8_03	
PROJECT DISTURBANCE AREA ID	AEC01	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 2-19-10 W4M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity. <p>SNK</p> <ul style="list-style-type: none"> PDAs within sensitive snake habitat range and sensitive snake hibernacula range will be swept daily for snakes prior to activity by appropriately trained personnel if physical abandonment activities occur during the snake active period (April 1 to October 31). Snakes encountered within the work area will be relocated to suitable habitat away from the work area as determined on a site-specific basis. If a snake relocation program is required, a permit for the capture and handling of snakes will be obtained from APEA prior to commencing the relocation program. Snake relocation will follow appropriate capture and handling guidelines. Reduce vehicle speed limits on all access roads within sensitive snake habitat range (< 50 km/hr on grid roads, and <30 km/hr on gravel roads/trails) during the snake active period (April 1 to October 31) to reduce snake mortality risk.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> PDA is located within lands with a designated Historic Resource Value (HRV) of 4 (contains a historic resource that may require avoidance)
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use (TLRU) sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1 regarding activities near watercourses.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

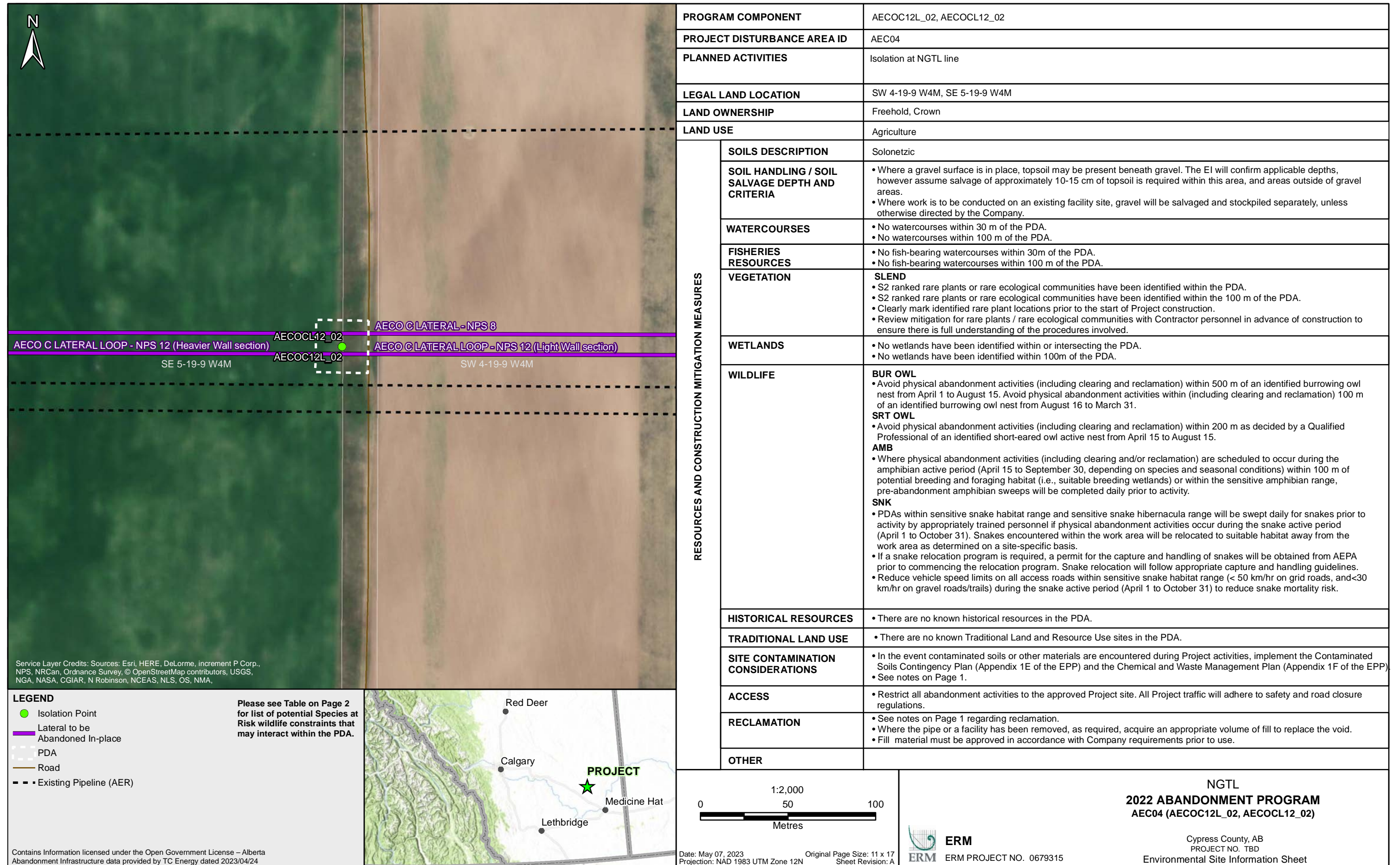


NGTL
2022 ABANDONMENT PROGRAM
AEC01 (AECOC12L_03, AECOC8_03)

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

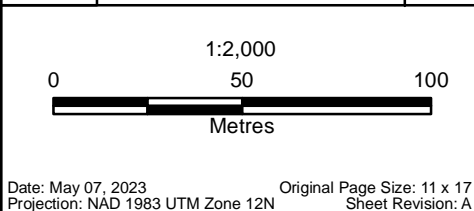


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LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

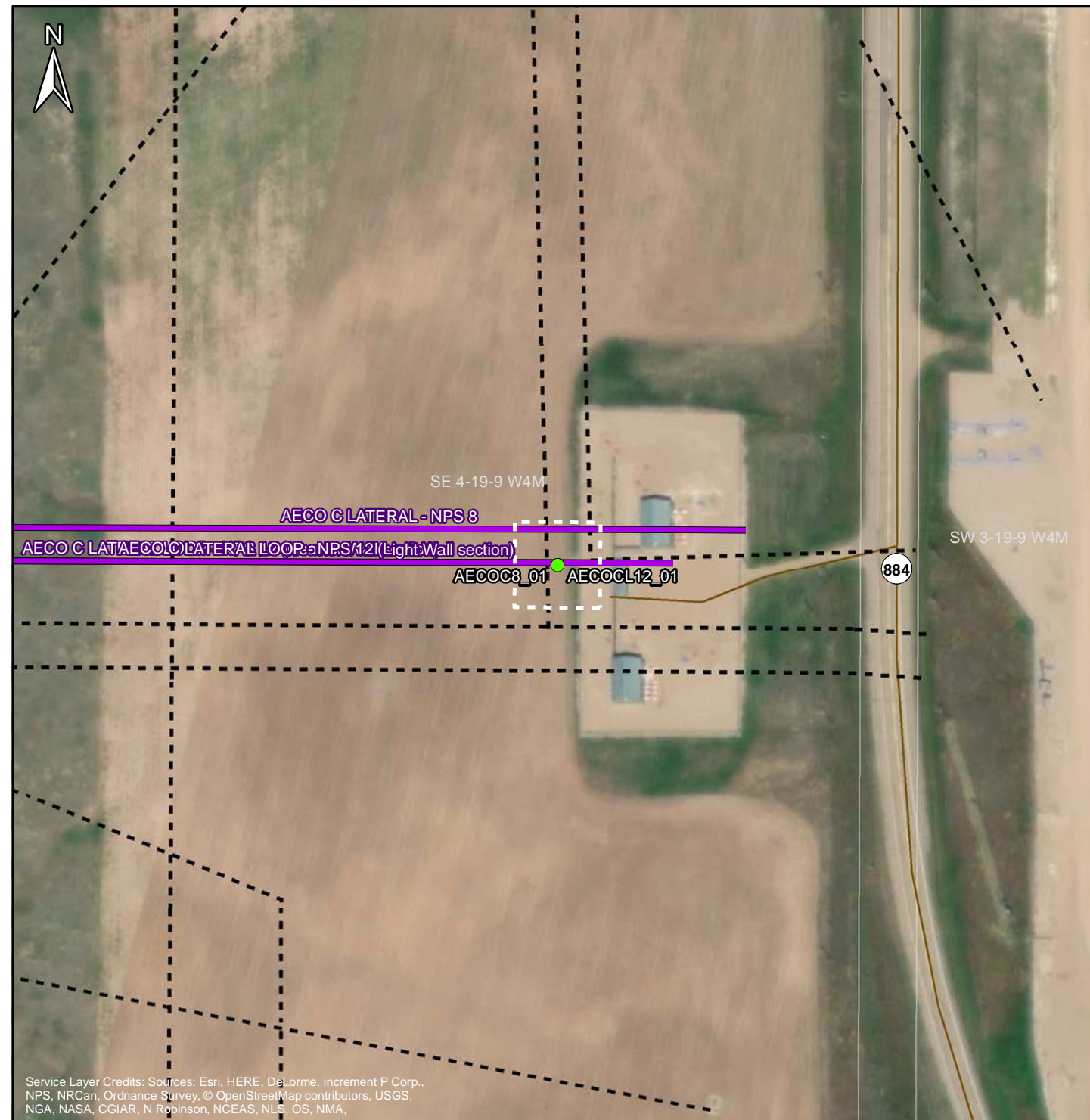


NGTL
2022 ABANDONMENT PROGRAM
AEC04 (AECOC12L_02, AECOCL12_02)

ERM
ERM PROJECT NO. 0679315

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	AECOC8_01, AECOCL12_01	
PROJECT DISTURBANCE AREA ID	AEC06	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 4-19-9 W4M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonchic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity. <p>SNK</p> <ul style="list-style-type: none"> PDA's within sensitive snake habitat range and sensitive snake hibernacula range will be swept daily for snakes prior to activity by appropriately trained personnel if physical abandonment activities occur during the snake active period (April 1 to October 31). Snakes encountered within the work area will be relocated to suitable habitat away from the work area as determined on a site-specific basis. If a snake relocation program is required, a permit for the capture and handling of snakes will be obtained from AEPA prior to commencing the relocation program. Snake relocation will follow appropriate capture and handling guidelines. Reduce vehicle speed limits on all access roads within sensitive snake habitat range (< 50 km/hr on grid roads, and <30 km/hr on gravel roads/trails) during the snake active period (April 1 to October 31) to reduce snake mortality risk.
	HISTORICAL RESOURCES	• There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	• There are no known Traditional Land and Resource Use (TLRU) sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
ACCESS	• Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.	
RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. 	
OTHER		

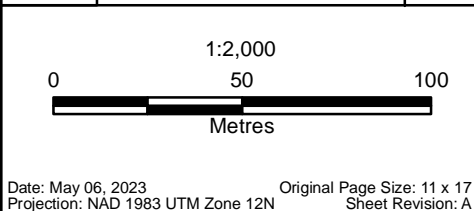
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- - - PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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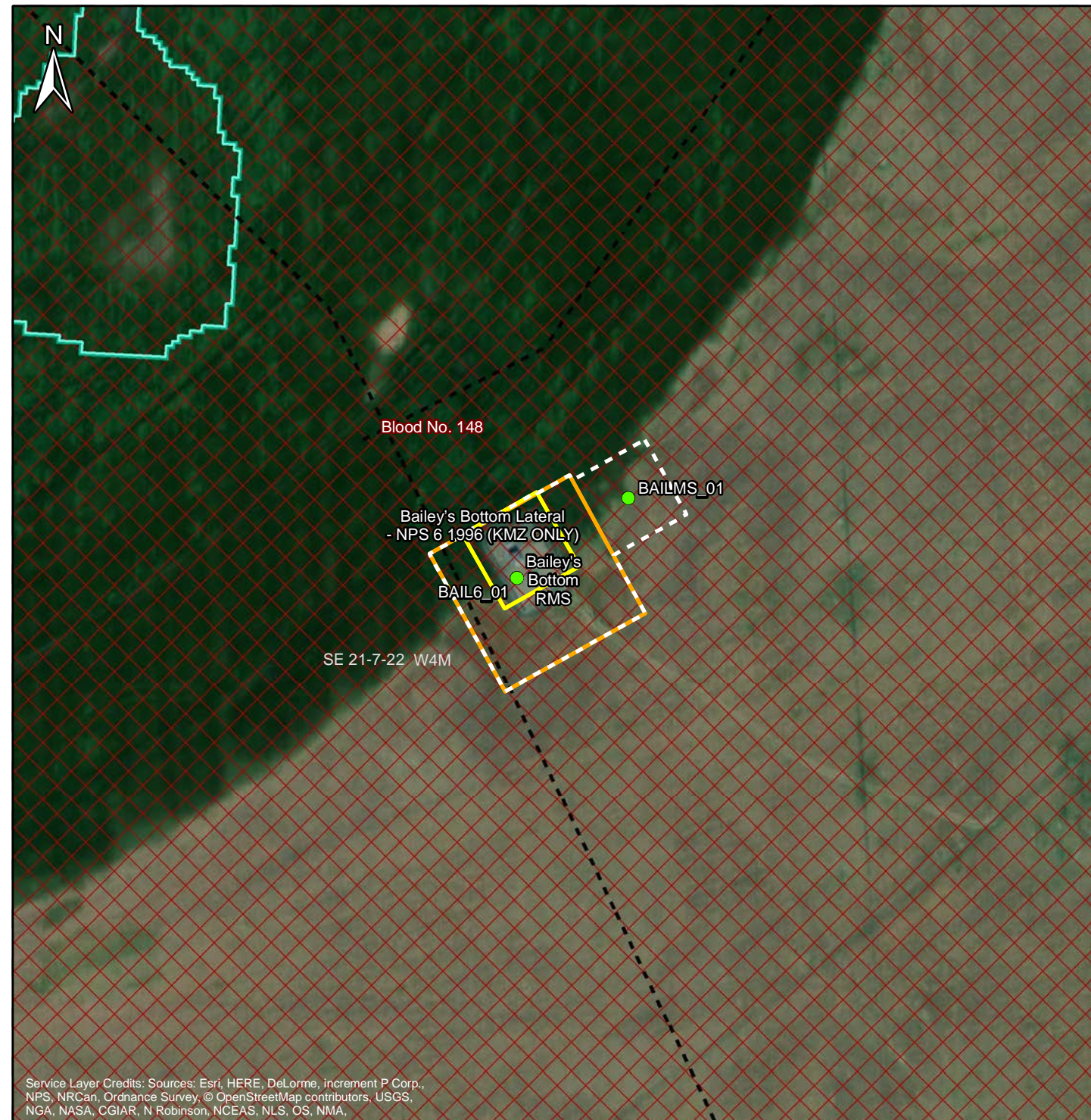


NGTL
2022 ABANDONMENT PROGRAM
AEC06 (AECOC8_01, AECOCL12_01)

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

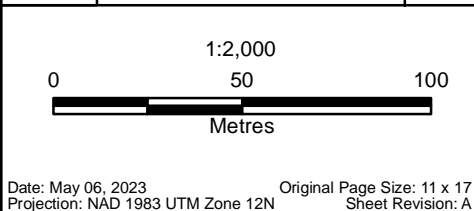


PROGRAM COMPONENT	Bailey's Bottom Lateral - NPS 6 1996	
PROJECT DISTURBANCE AREA ID	BAI01	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 21-7-22 W4M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Agriculture	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use (TLRU) sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- PT1
- PDA
- Existing Pipeline (AER)
- First Nations Reserve Land
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
BAI01 (Bailey's Bottom RMS)

Cardston County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	BIGSL12_03	
PROJECT DISTURBANCE AREA ID	BIG02	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 10-61-22 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols, Regosolic and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



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Metres

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

Original Page Size: 11 x 17
Sheet Revision: A

NGTL
2022 ABANDONMENT PROGRAM
BIG02 (BIGSL12_03)

M.D. of Greenview No. 16, AB

PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

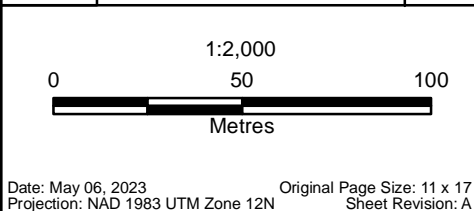


PROGRAM COMPONENT	BIGSL12_01	
PROJECT DISTURBANCE AREA ID	BIG03	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 10-61-22 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols, Regosolic and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminate Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- PDA
- Other Component PDA
- Road
- Railway
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

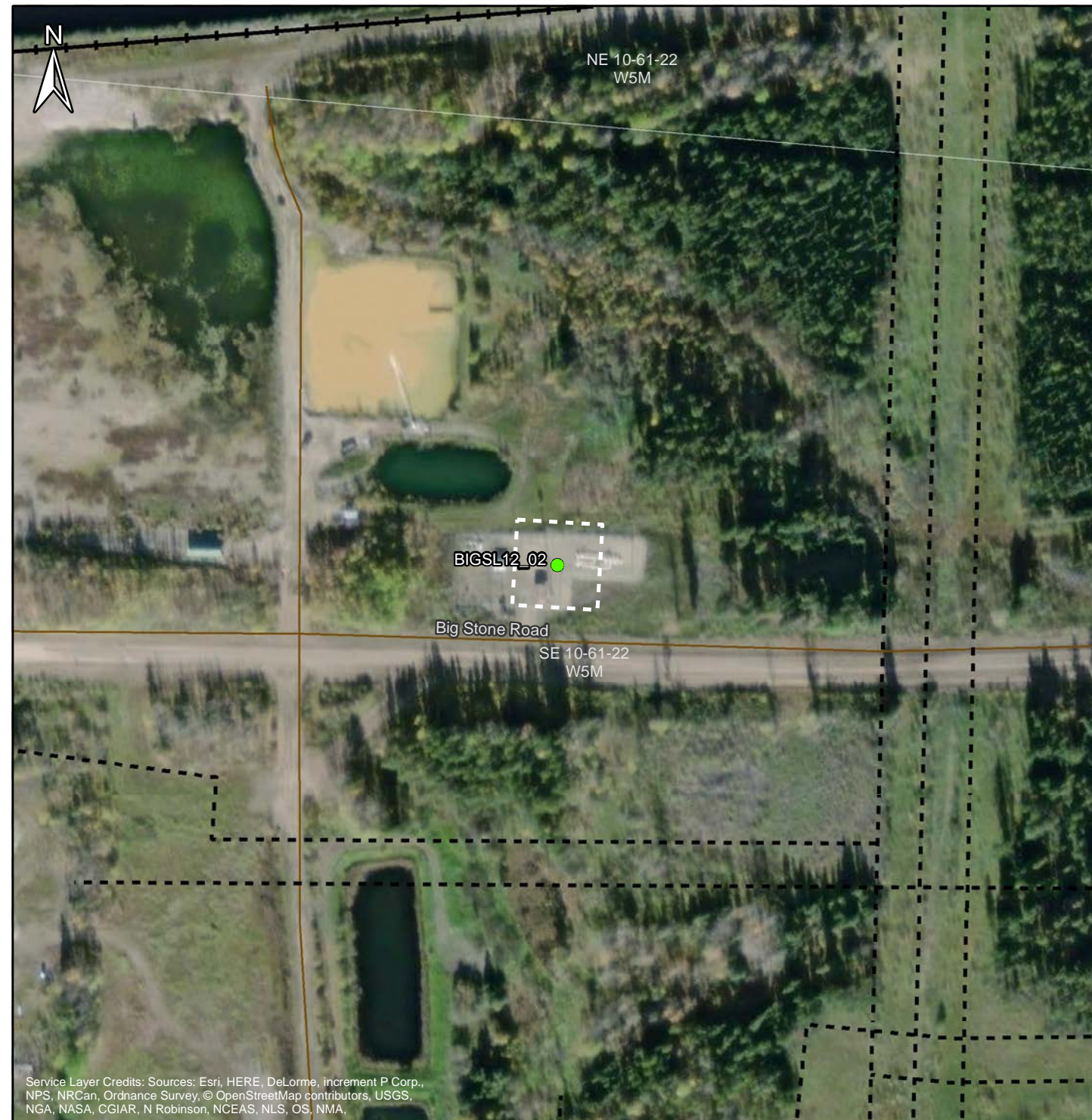


NGTL
2022 ABANDONMENT PROGRAM
BIG03 (BIGSL12_01)

M.D. of Greenview No. 16, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	BIGSL12_02	
PROJECT DISTURBANCE AREA ID	BIG04	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 10-61-22 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols, Regosolic and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. A watercourse was identified within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- PDA
- Road
- Railway
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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Metres

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

Original Page Size: 11 x 17
Sheet Revision: A

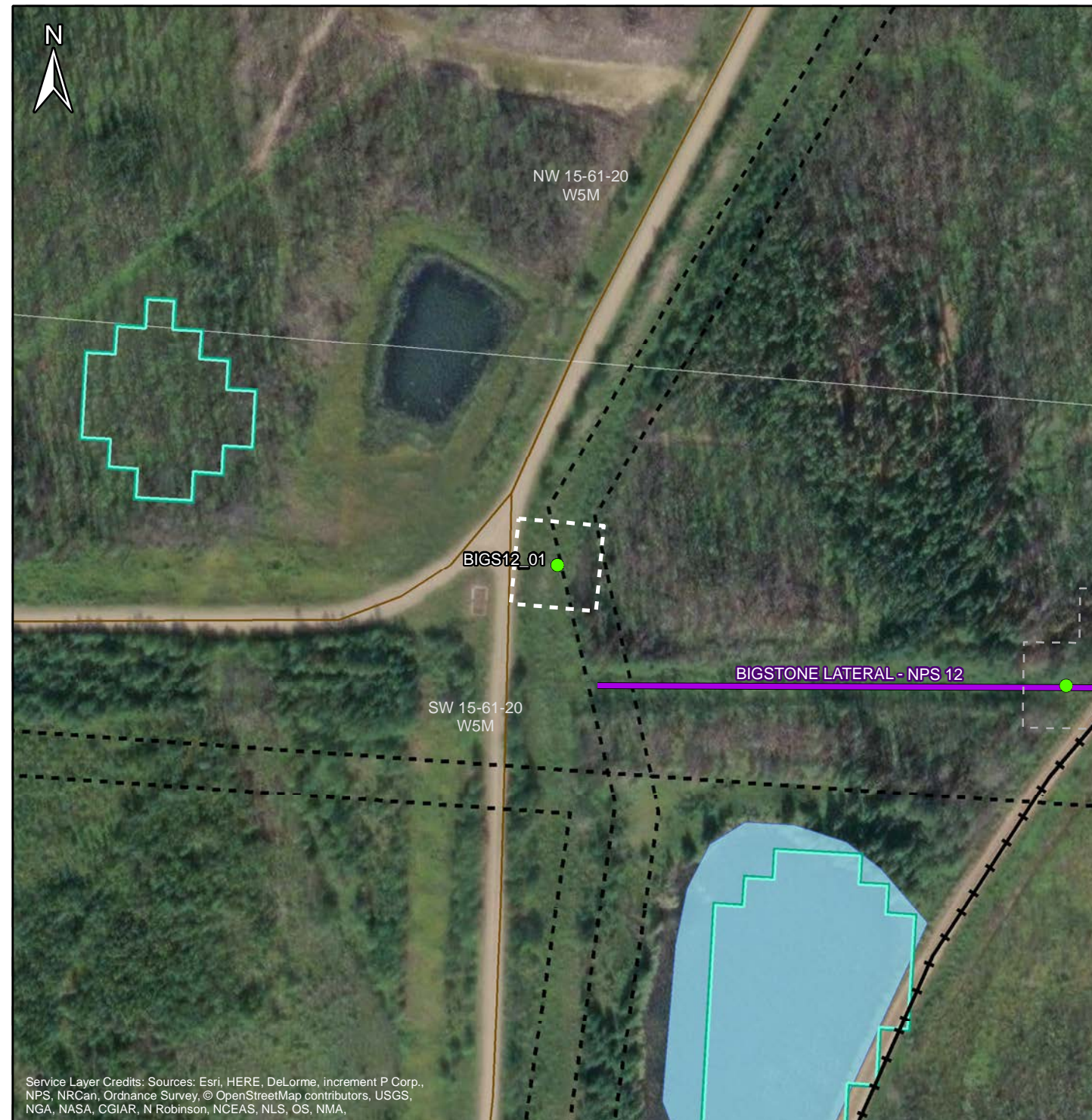
NGTL
2022 ABANDONMENT PROGRAM
BIG04 (BIGSL12_02)

M.D. of Greenview No. 16, AB

PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



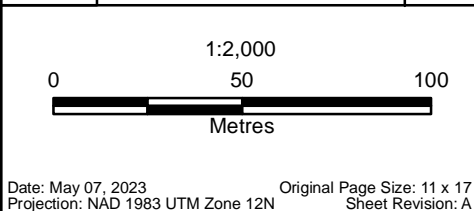
PROGRAM COMPONENT	BIGS12_01	
PROJECT DISTURBANCE AREA ID	BIG07	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SW 15-61-20 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols, Regosolic and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEP to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Railway
- - - Existing Pipeline (AER)
- Mapped Waterbody (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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NGTL
2022 ABANDONMENT PROGRAM
BIG07 (BIGS12_01)

M.D. of Greenview No. 16, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	BIGS12_02, BIGS12_03RR, BIGS12_04RR	
PROJECT DISTURBANCE AREA ID	BIG08	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SW 15-61-20 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols, Regosolic and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. A watercourse was identified within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Railway
- Existing Pipeline (AER)
- Mapped Waterbody (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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Scale: 1:2,000

0 50 100 Metres

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

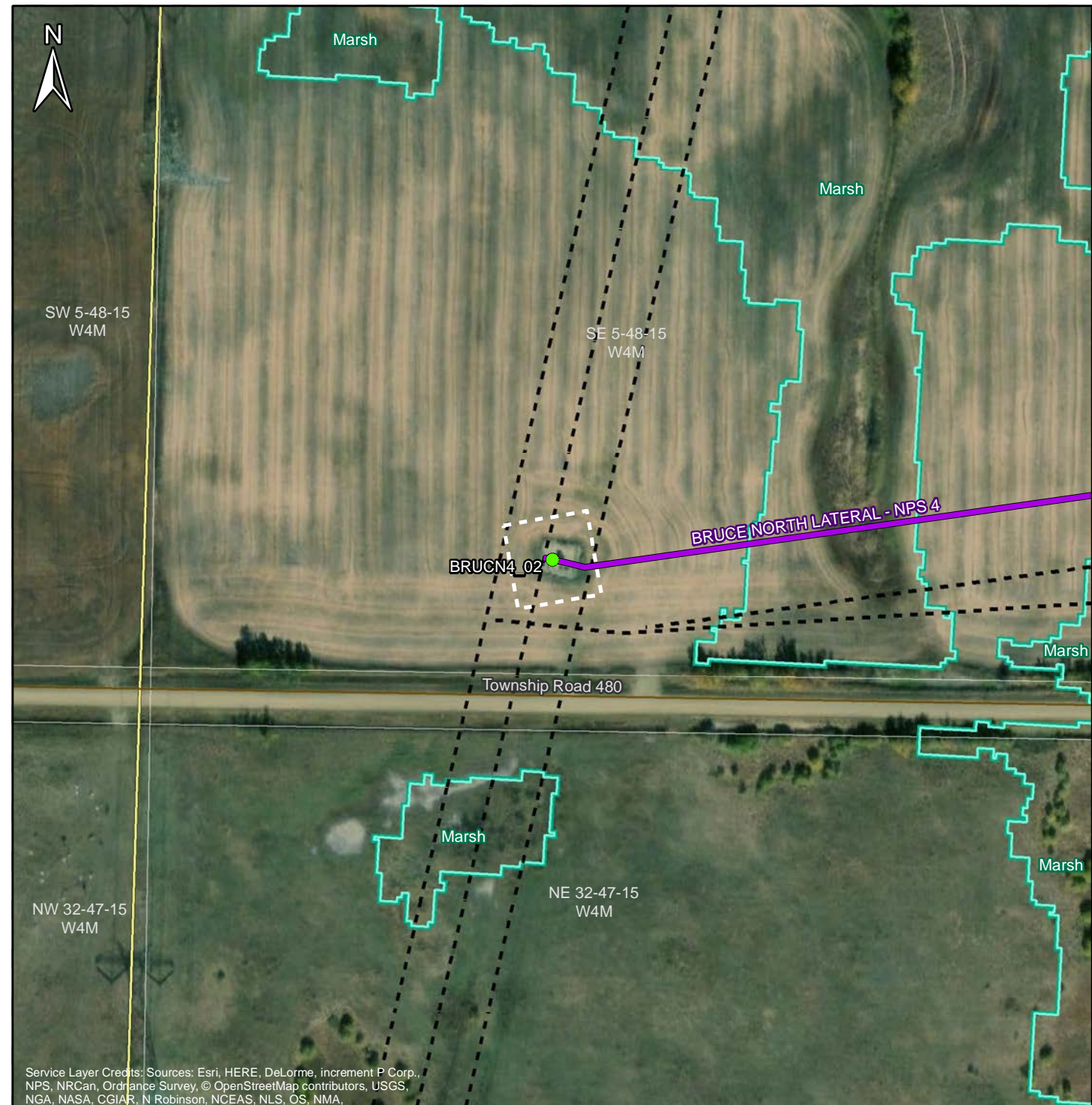
Original Page Size: 11 x 17
Sheet Revision: A

NGTL
2022 ABANDONMENT PROGRAM
BIG08 (BIGS12_02, BIGS12_03RR, BIGS12_04RR)

M.D. of Greenview No. 16, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

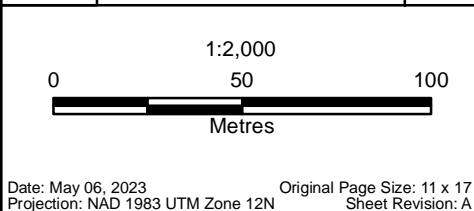
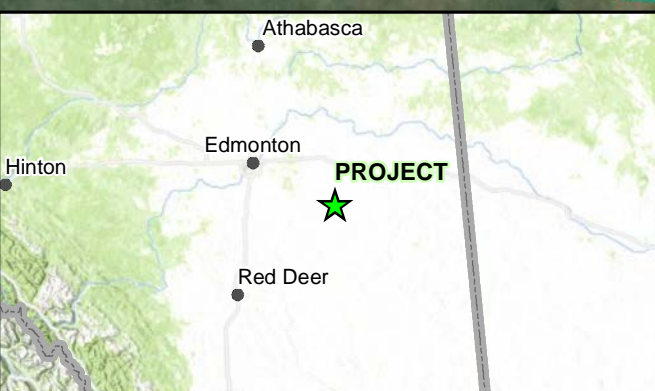


PROGRAM COMPONENT	BRUCN4_02	
PROJECT DISTURBANCE AREA ID	BRUN01	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 5-48-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonchic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Electrical Transmission Line
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

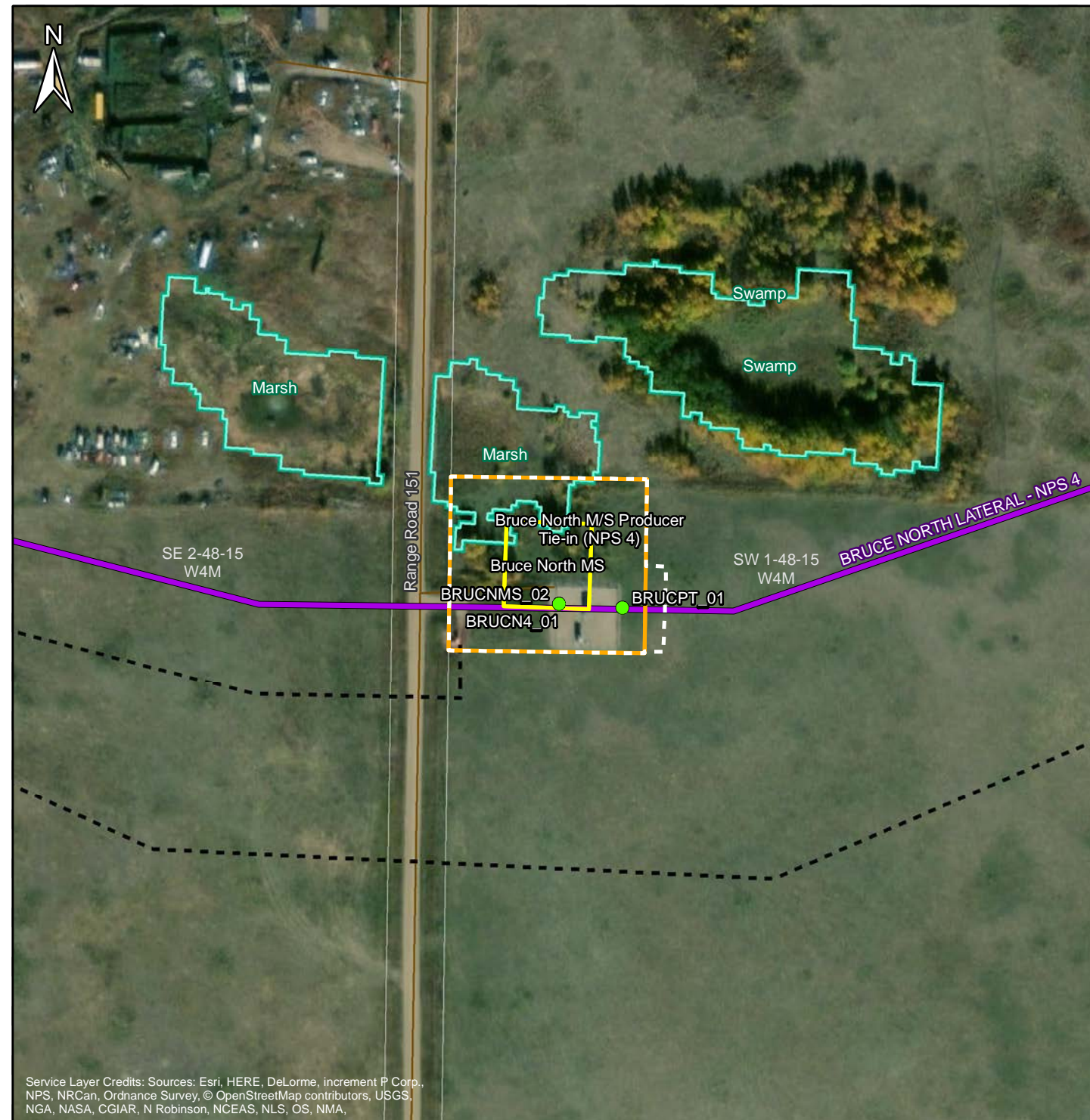


NGTL
2022 ABANDONMENT PROGRAM
BRUN01 (BRUCN4_02)

Beaver County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

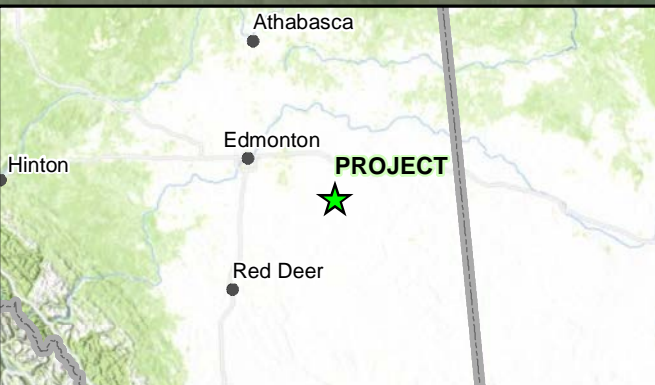
THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Meter Station
- PTI
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



PROGRAM COMPONENT	Bruce North MS, Bruce North M/S Producer Tie-in (NPS 4), BRUCN4_01, BRUCNMS_02, BRUCPT_01	
PROJECT DISTURBANCE AREA ID	BRUN04	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SW 01-048-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<ul style="list-style-type: none"> SRT OWL Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

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Date: May 06, 2023 Original Page Size: 11 x 17 Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

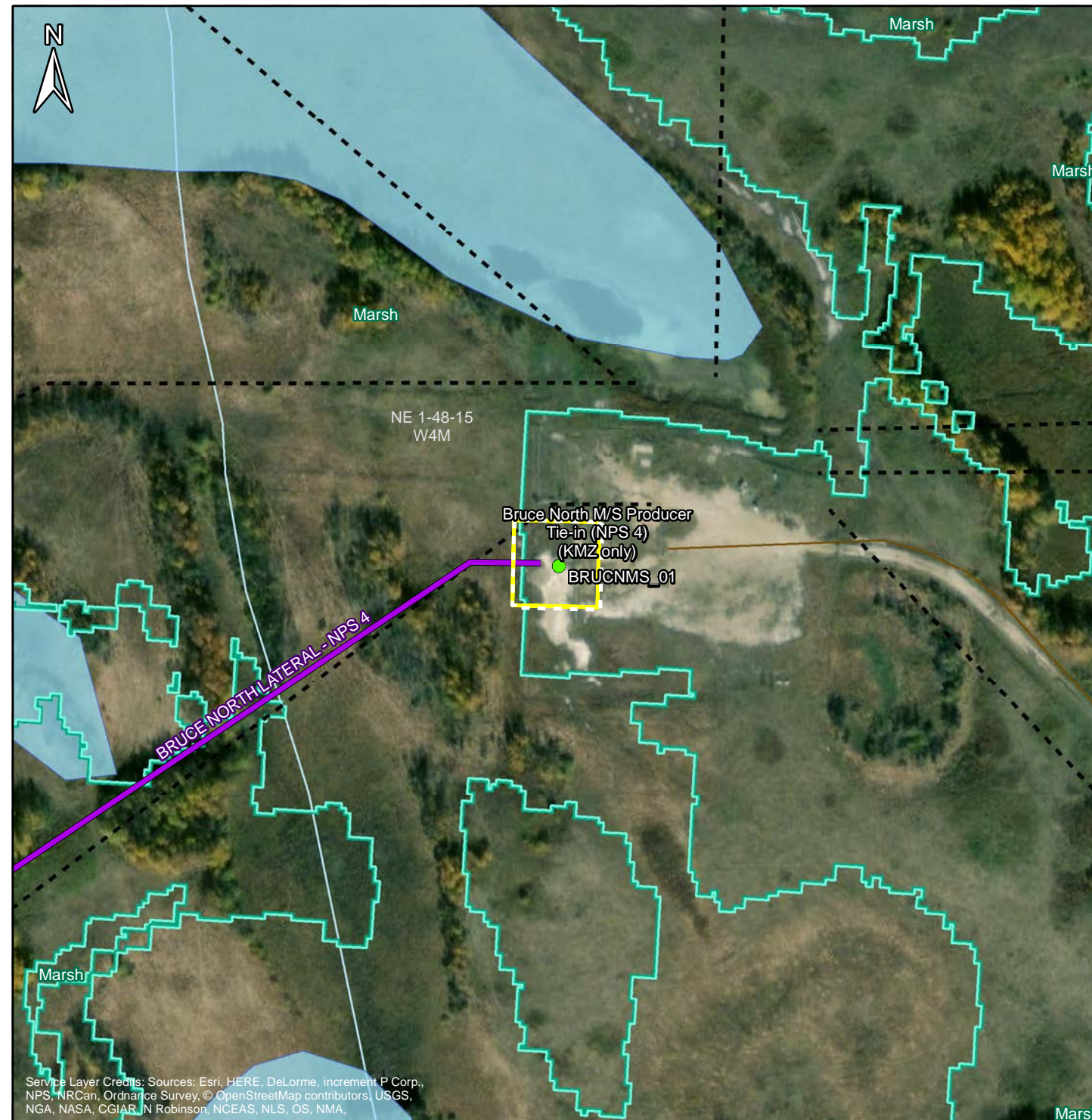
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Scale: 1:2,000 0 50 100 Metres

ERM ERM PROJECT NO. 0679315

NGTL 2022 ABANDONMENT PROGRAM BRUN04 (Bruce North RMS, Bruce North MS PTI, BRUCN4_01, BRUCNMS_02, BRUCPT_01) Beaver County, AB PROJECT NO. TBD Environmental Site Information Sheet

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



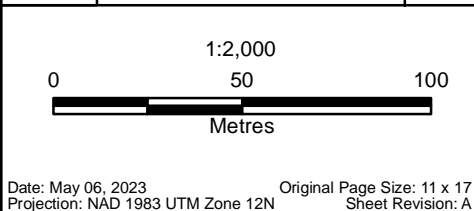
PROGRAM COMPONENT	Bruce North M/S Producer Tie-in (NPS 4)	
PROJECT DISTURBANCE AREA ID	BRUN05	
PLANNED ACTIVITIES	Isolation (producer line) Isolation at NGTL line	
LEGAL LAND LOCATION	NE 1-48-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic. Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. A watercourse was identified within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> in the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- PTI
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Waterbody (Altalis)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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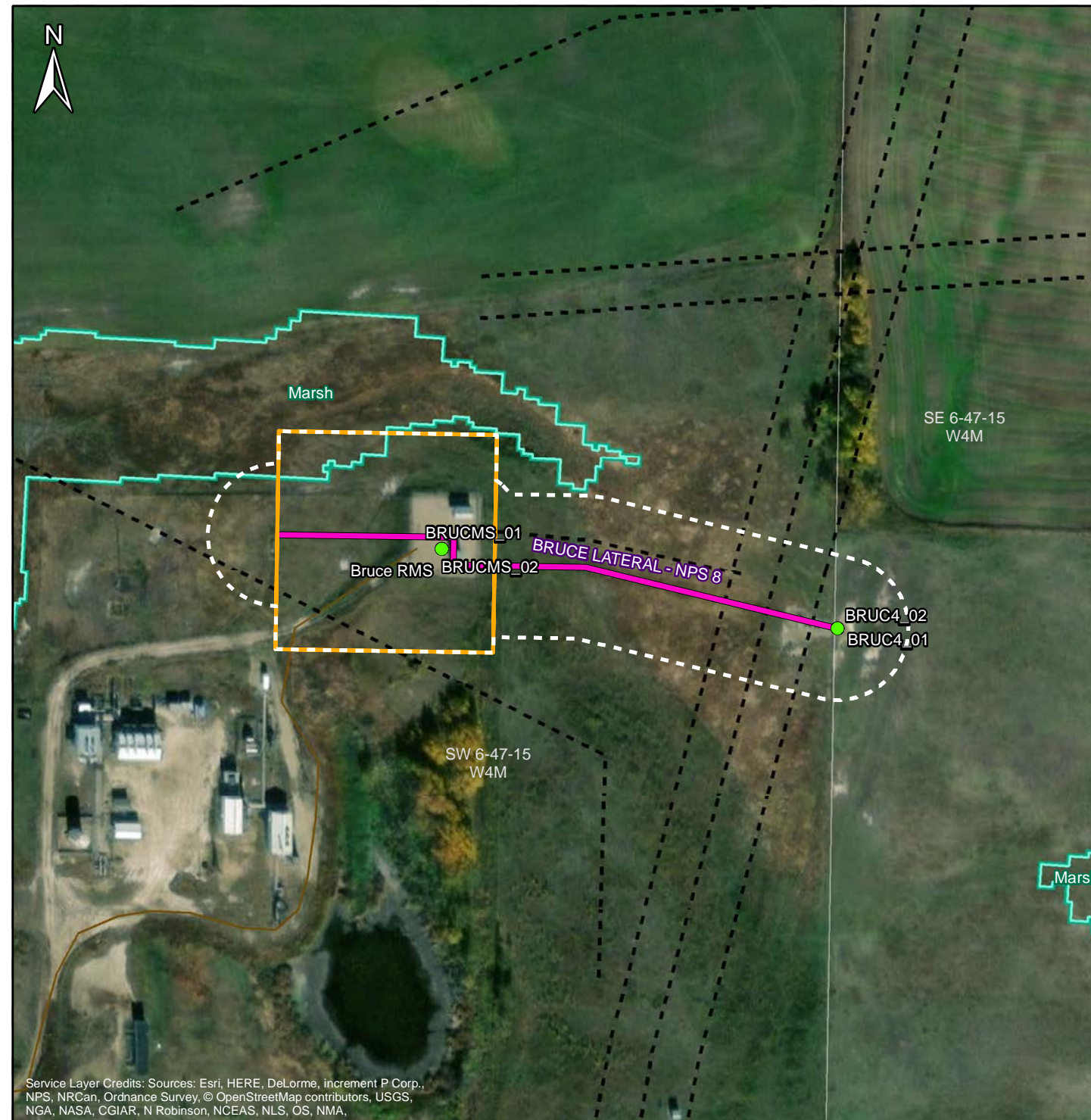


NGTL
2022 ABANDONMENT PROGRAM
BRUN05 (Bruce North MS PTI)

Beaver County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

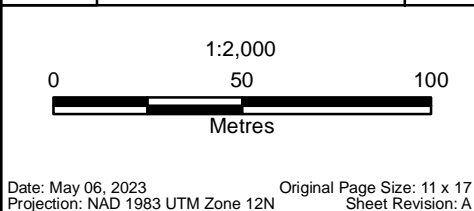


PROGRAM COMPONENT	Bruce Lateral - NPS 8, Bruce RMS, BRUCMS_01, BRUCMS_02, BRUC4_01, BRUC4_02	
PROJECT DISTURBANCE AREA ID	BRU01	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SW 6-47-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonchic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- Lateral - to be Removed
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
BRU01 (Bruce Lateral, Bruce RMS, BRUCMS_01, BRUCMS_02, BRUC4_01, BRUC4_02)
Beaver County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

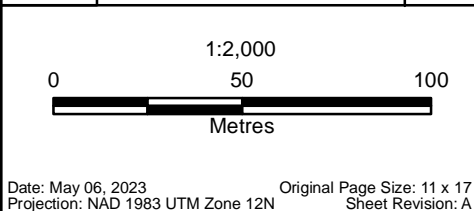


PROGRAM COMPONENT	JOSEMS_01, Josephine RMS, JOSEMS_02, Josephine MS Producer Tie-In (NPS 10)	
PROJECT DISTURBANCE AREA ID	JOS02	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	NW 36-82-10 W6M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. See notes on Page 1.
	ACCESS	Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- PTI
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
JOS02 (JOSEMS_01, Josephine RMS, JOSEMS_02, Josephine MS PTI)
Saddle Hills County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

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THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	JOSE10P_01	
PROJECT DISTURBANCE AREA ID	JOS04	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	NE 1-83-10 W6M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- ▭ PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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NGTL
2022 ABANDONMENT PROGRAM
JOS04 (JOSE10P_01)

Saddle Hills County, AB

PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

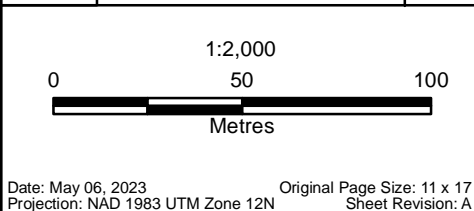


PROGRAM COMPONENT	Kehiwin RMS, KEHIMS_01, KEHIMS_02, KEHIMS_03, KEHIMS_04	
PROJECT DISTURBANCE AREA ID	KEH01	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	SE 25-59-7 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- PDA
- Highway
- Road
- Existing Pipeline (AER)
- First Nations Reserve Land

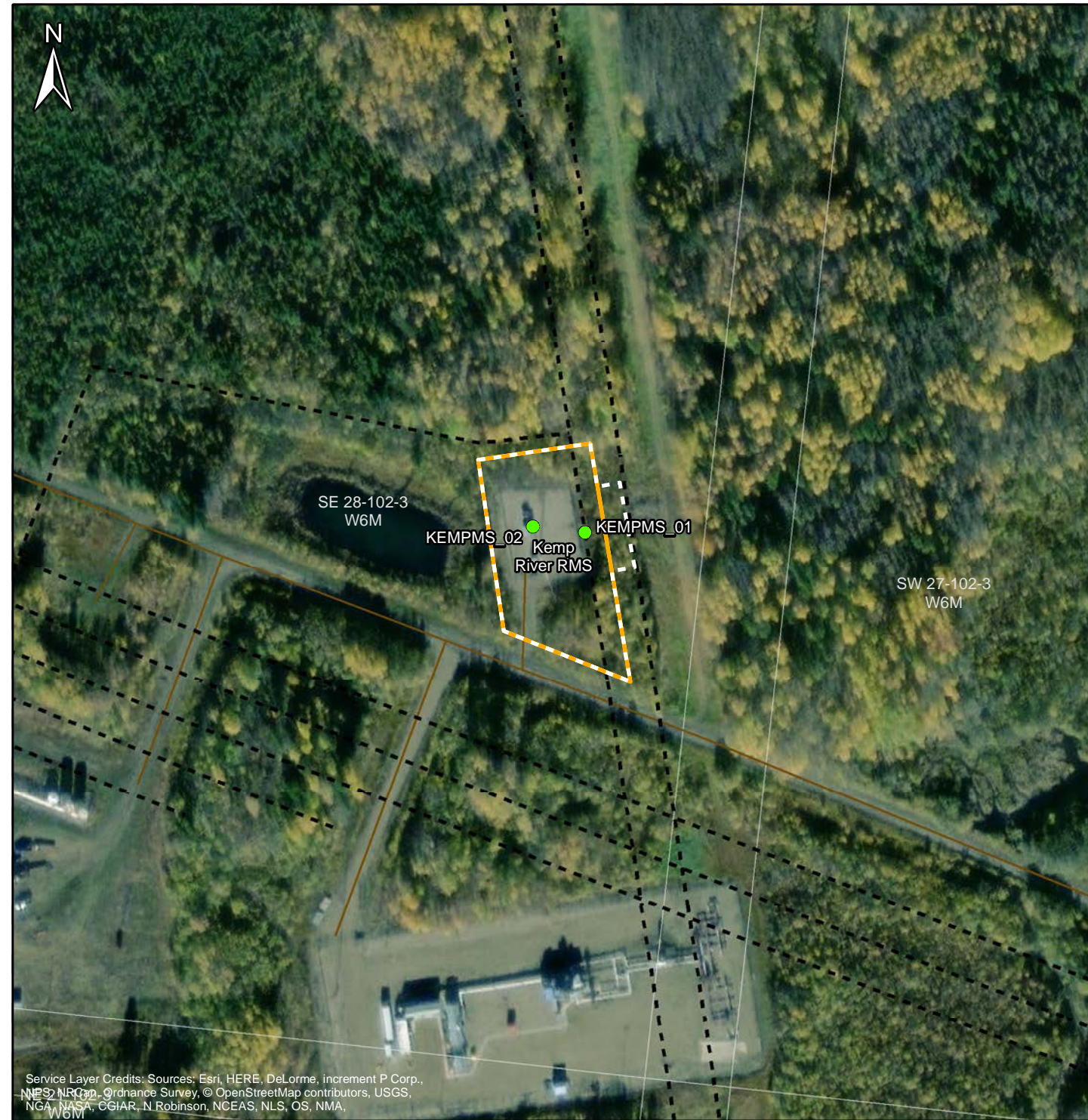
Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
KEH01 (Kehiwin RMS, KEHIMS_01, KEHIMS_02, KEHIMS_03, KEHIMS_04)
M.D. of Bonnyville No. 87, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



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LEGEND

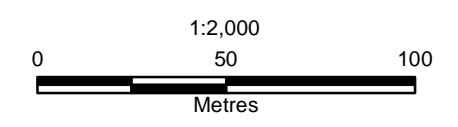
- Isolation Point
- Meter Station
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



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PROGRAM COMPONENT	Kemp River RMS, KEMPMS_01, KEMPMS_02	
PROJECT DISTURBANCE AREA ID	KEM01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL linesolation at NGTL line	
LEGAL LAND LOCATION	SE 28-102-03 W6M	
LAND OWNERSHIP	Crown	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Regosolic, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEP to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	



Date: May 07, 2023
Projection: NAD 1983 UTM Zone 12N
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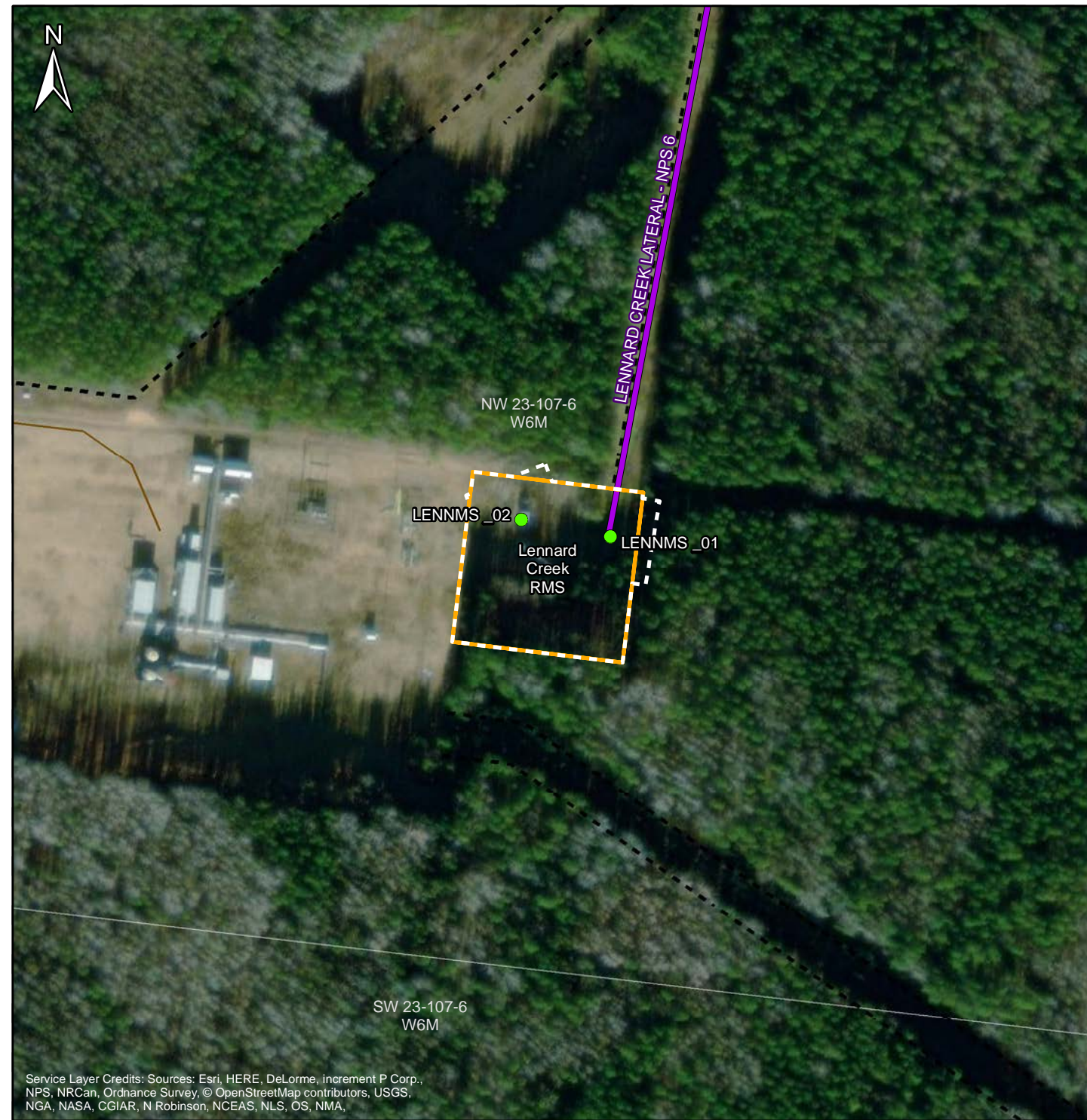
NGTL
2022 ABANDONMENT PROGRAM
KEM01 (Kemp River RMS, KEMPMS_01, KEMPMS_02)

County of Northern Lights, AB

PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



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LEGEND

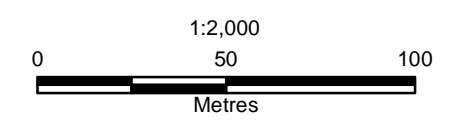
- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



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PROGRAM COMPONENT	Lennard Creek RMS, LENNMS _02, LENNMS _01	
PROJECT DISTURBANCE AREA ID	LEN02	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	NW 23-107-06 W6M	
LAND OWNERSHIP	Crown	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>CAR</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within the caribou RAP (February 15 through July 15) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEPa and implement appropriate mitigation measures to reduce Project effects on caribou populations and caribou habitat. Speed limits will be established with signage and enforced on all access used for the Project within caribou range. If caribou are encountered on roads, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area. <p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPa to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	



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Original Page Size: 11 x 17
Sheet Revision: A



NGTL
2022 ABANDONMENT PRPGRAM
LEN02 (Lennard Creek RMS, LENNMS _02, LENNMS _01)

Mackenzie County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



PROGRAM COMPONENT	LENL6_02	
PROJECT DISTURBANCE AREA ID	LEN08	
PLANNED ACTIVITIES	Isolation at NGTL Line	
LEGAL LAND LOCATION	NE 14-108-6 W6M	
LAND OWNERSHIP	Crown	
LAND USE	Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>CAR</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within the caribou RAP (February 15 through July 15) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEPA and implement appropriate mitigation measures to reduce Project effects on caribou populations and caribou habitat. Speed limits will be established with signage and enforced on all access used for the Project within caribou range. If caribou are encountered on roads, stop vehicles/equipment and allow the caribou to move through the area undisturbed. Advise others working nearby of the presence of caribou in the area. <p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> See access and activity restrictions in Caribou Habitat Range, above. Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
OTHER		

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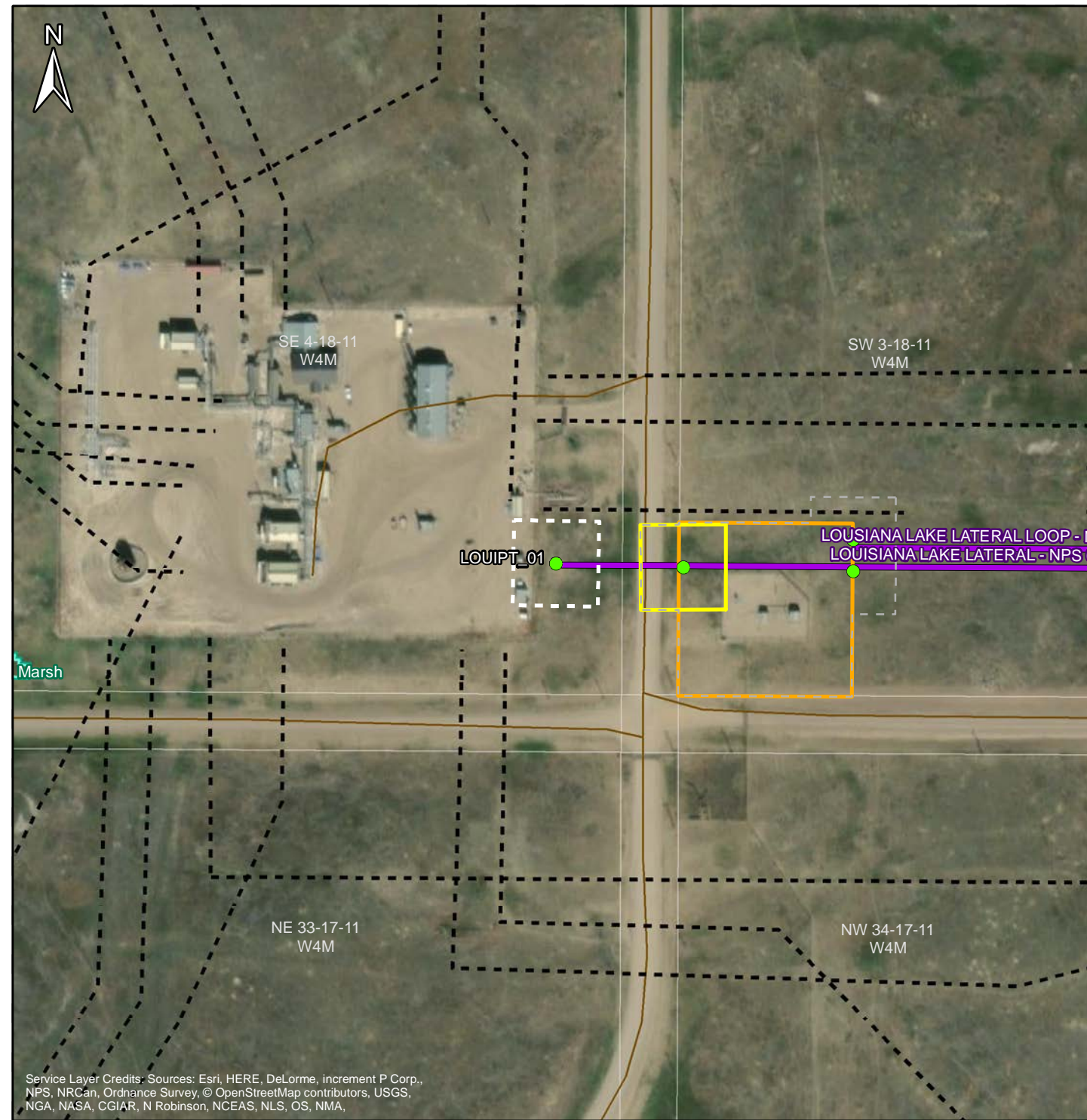
NGTL
2022 ABANDONMENT PROGRAM
LEN08 (LENL6_02)
Mackenzie County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

Original Page Size: 11 x 17
Sheet Revision: A

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

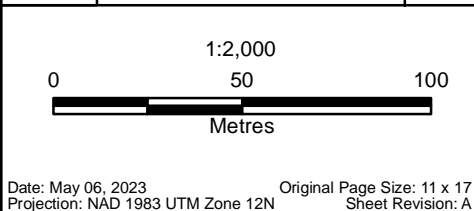


PROGRAM COMPONENT	LOUIPT_01	
PROJECT DISTURBANCE AREA ID	LOU01.2	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 4-18-11 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	• There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	• There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	• Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
OTHER		

LEGEND

- Isolation Point
- Meter Station
- PTI
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- - - Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential species at Risk wildlife constraints that may interact within the PDA.

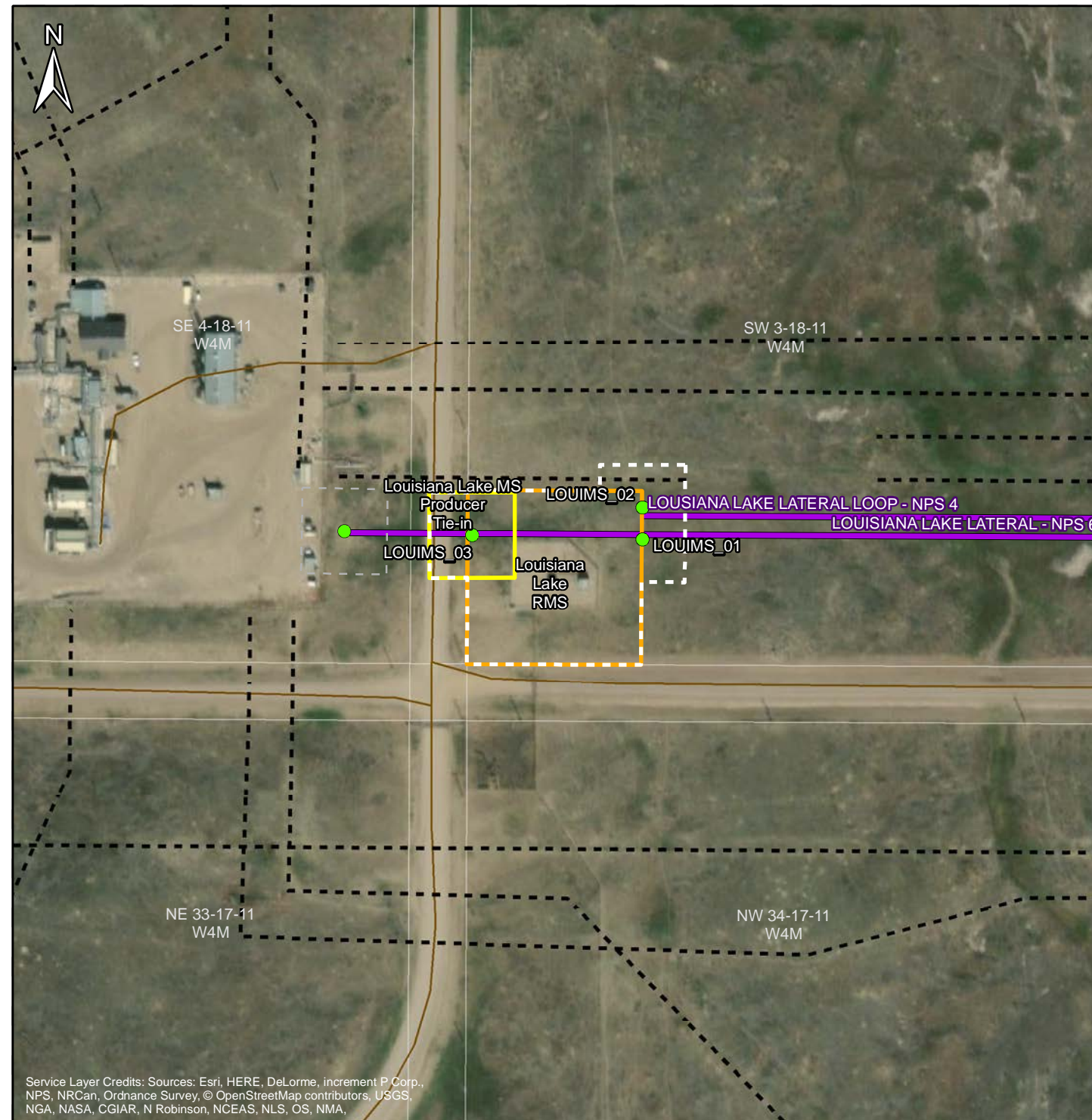


NGTL
2022 ABANDONMENT PROGRAM
LOU01.2 (LOUIPT_01)

County of Newell, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

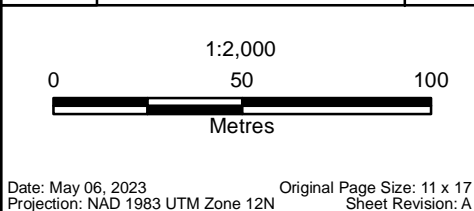


PROGRAM COMPONENT	Louisiana Lake RMS, Louisiana Lake MS Producer Tie-in, LOUIMS_02, LOUIMS_03, LOUIPT_01, LOUIMS_01	
PROJECT DISTURBANCE AREA ID	LOU02	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway	
LEGAL LAND LOCATION	SW 03-018-11 W4M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonchic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> PDA is located within lands with a designated Historic Resource Value (HRV) of 5 (high potential to contain a historic resource)
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- PTI
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

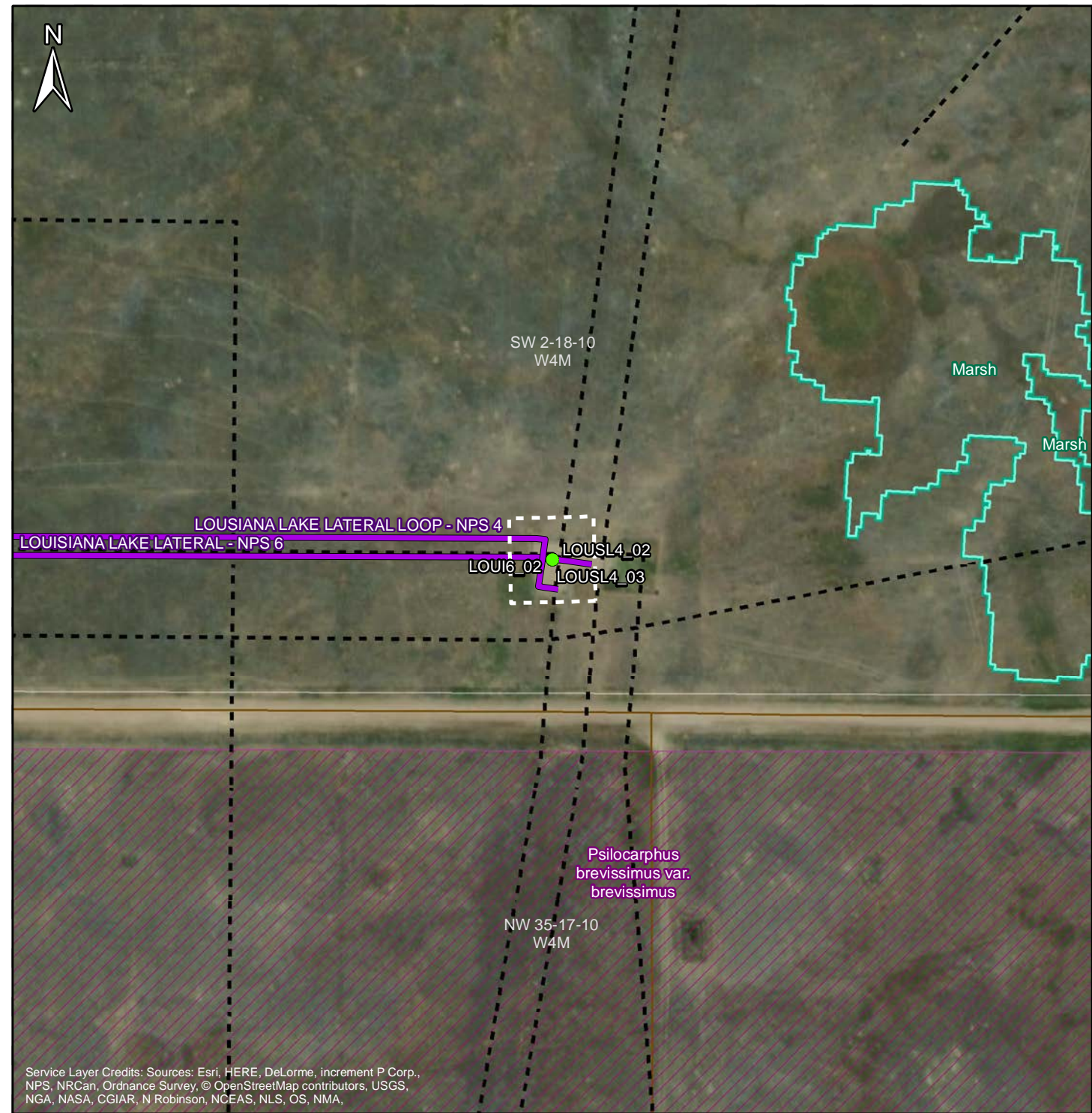


NGTL
2022 ABANDONMENT PROGRAM
LOU02 (Louisiana Lake RMS, Louisiana Lake MS PTI, LOUIMS_02, LOUIMS_03, LOUIPT_01, LOUIMS_01)
County of Newell, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N
Original Page Size: 11 x 17
Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	LOUI6_02, LOUSL4_02, LOUSL4_03	
PROJECT DISTURBANCE AREA ID	LOU07	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 2-18-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> PDA is located within lands with a designated Historic Resource Value (HRV) of 5 (high potential to contain a historic resource)
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

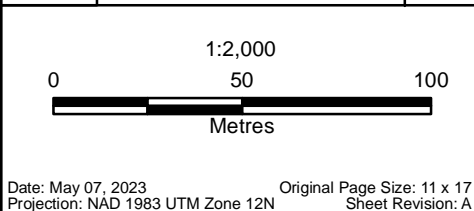
LEGEND

- Isolation Point
- ▬ Lateral to be Abandoned In-place
- ▬ PDA
- ▬ Road
- ▬ Existing Pipeline (AER)
- ▨ Historical Rare Plant Occurrence – ACIMS
- ▭ Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

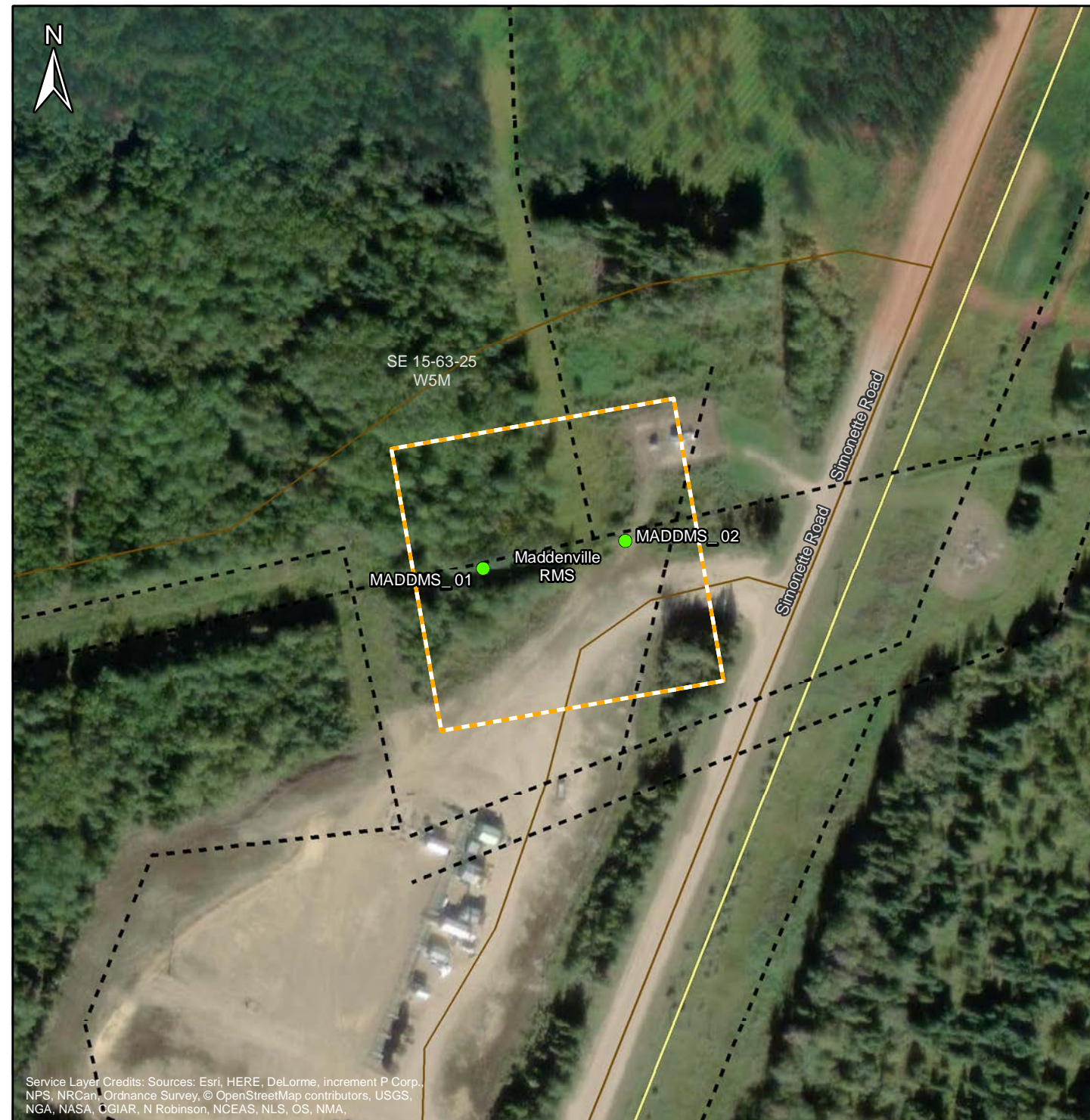


NGTL
2022 ABANDONMENT PROGRAM
LOU07 (LOUI6_02, LOUSL4_02, LOUSL4_03)

ERM
ERM PROJECT NO. 0679315

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Meter Station
- PDA
- Road
- Electrical Transmission Line
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	Maddenville RMS, MADDMS_01, MADDMS_02	
PROJECT DISTURBANCE AREA ID	MAD01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line/isolation at NGTL line	
LEGAL LAND LOCATION	SE 15-063-25 W5M	
LAND OWNERSHIP	Crown	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

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Metres

NGTL
2022 ABANDONMENT PROGRAM
MAD01 (Maddenville RMS, MADDMS_01, MADDMS_02)

M.D. of Greenview No. 16, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 07, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	Minburn Receipt RMS, MINBMS_02, MINBMS_01	
PROJECT DISTURBANCE AREA ID	MIN02	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line Removal of meter station, including buildings, yard piping, fencing, gravel and driveway	
LEGAL LAND LOCATION	SE 24-051-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> • Chernozemic • Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> • Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. • Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> • No watercourses within 30 m of the PDA. • No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> • No fish-bearing watercourses within 30m of the PDA. • No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> • No rare plants or rare ecological communities have been identified within the PDA. • No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> • No wetlands have been identified within or intersecting the PDA. • No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> • Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> • There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> • There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> • In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). • Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. • See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> • Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> • See notes on Page 1 regarding reclamation. • Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. • Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

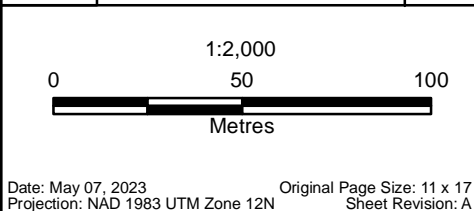
LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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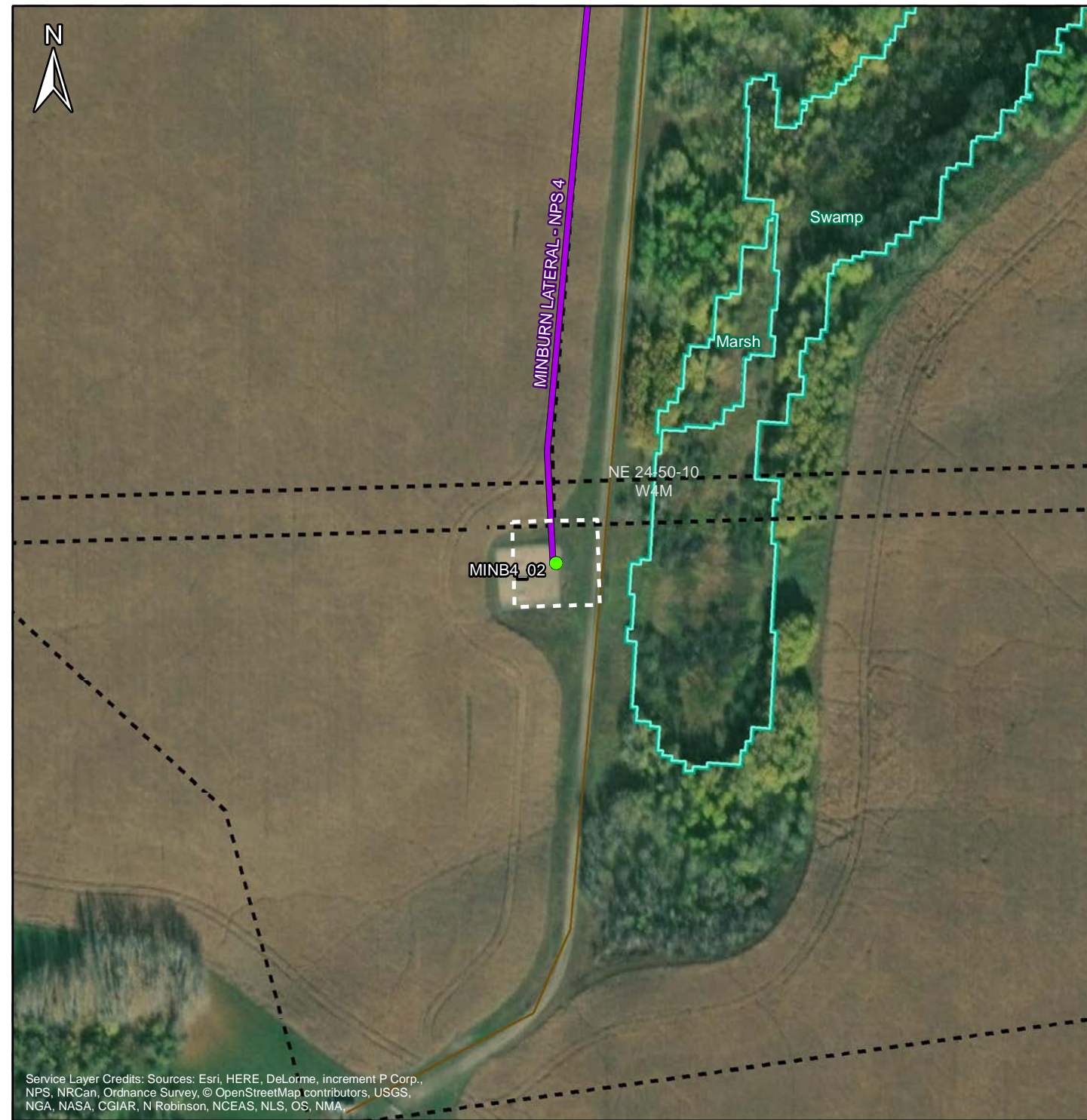


NGTL
2022 ABANDONMENT PROGRAM
MIN02 (Minburn Receipt RMS, MINBMS_02, MINBMS_01)

County of Minburn No. 27, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



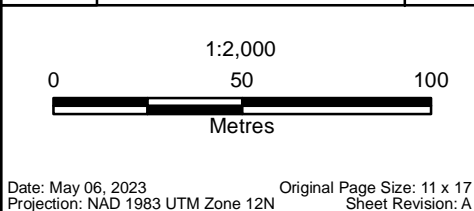
PROGRAM COMPONENT	MINB4_02	
PROJECT DISTURBANCE AREA ID	MIN08	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NE 24-50-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

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LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

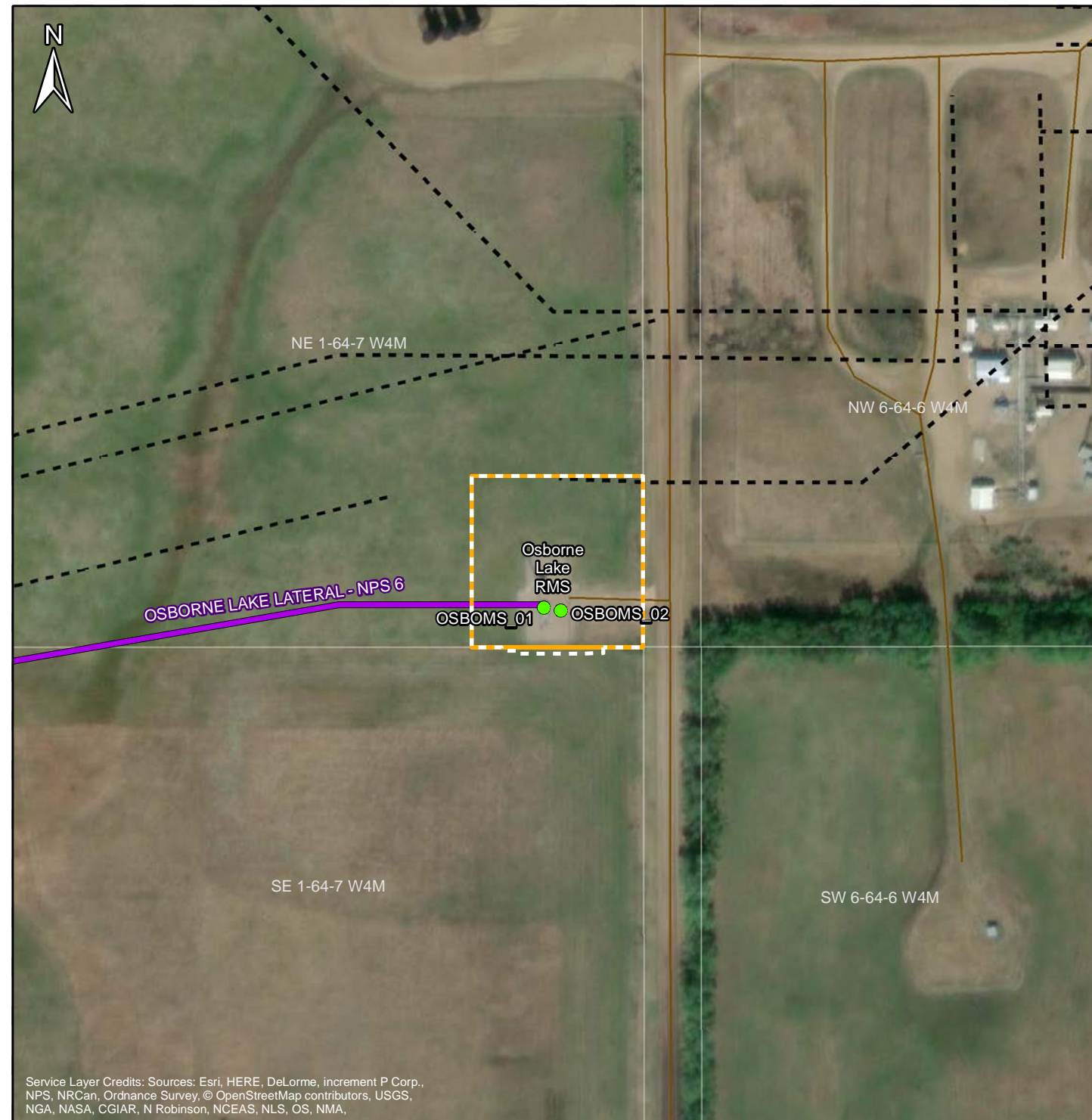


**NGTL
2022 ABANDONMENT PROGRAM
MIN08 (MINB4_02)**

County of Minburn No. 27, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	Osborne Lake RMS, OSBOMS_02, OSBOMS_01	
PROJECT DISTURBANCE AREA ID	OSB02	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	NE 1-64-7 W4M, SE 1-64-7 W4M, NE 01-064-07 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	• Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	• Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. • Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	• No watercourses within 30 m of the PDA. • No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	• No fish-bearing watercourses within 30m of the PDA. • No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	• No rare plants or rare ecological communities have been identified within the PDA. • No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	• No wetlands have been identified within or intersecting the PDA. • No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL • Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	• There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	• There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	• In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). • See notes on Page 1.
	ACCESS	• Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	• See notes on Page 1 regarding reclamation. • Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. • Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

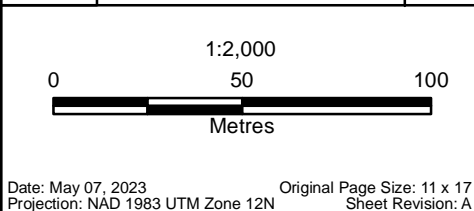
LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

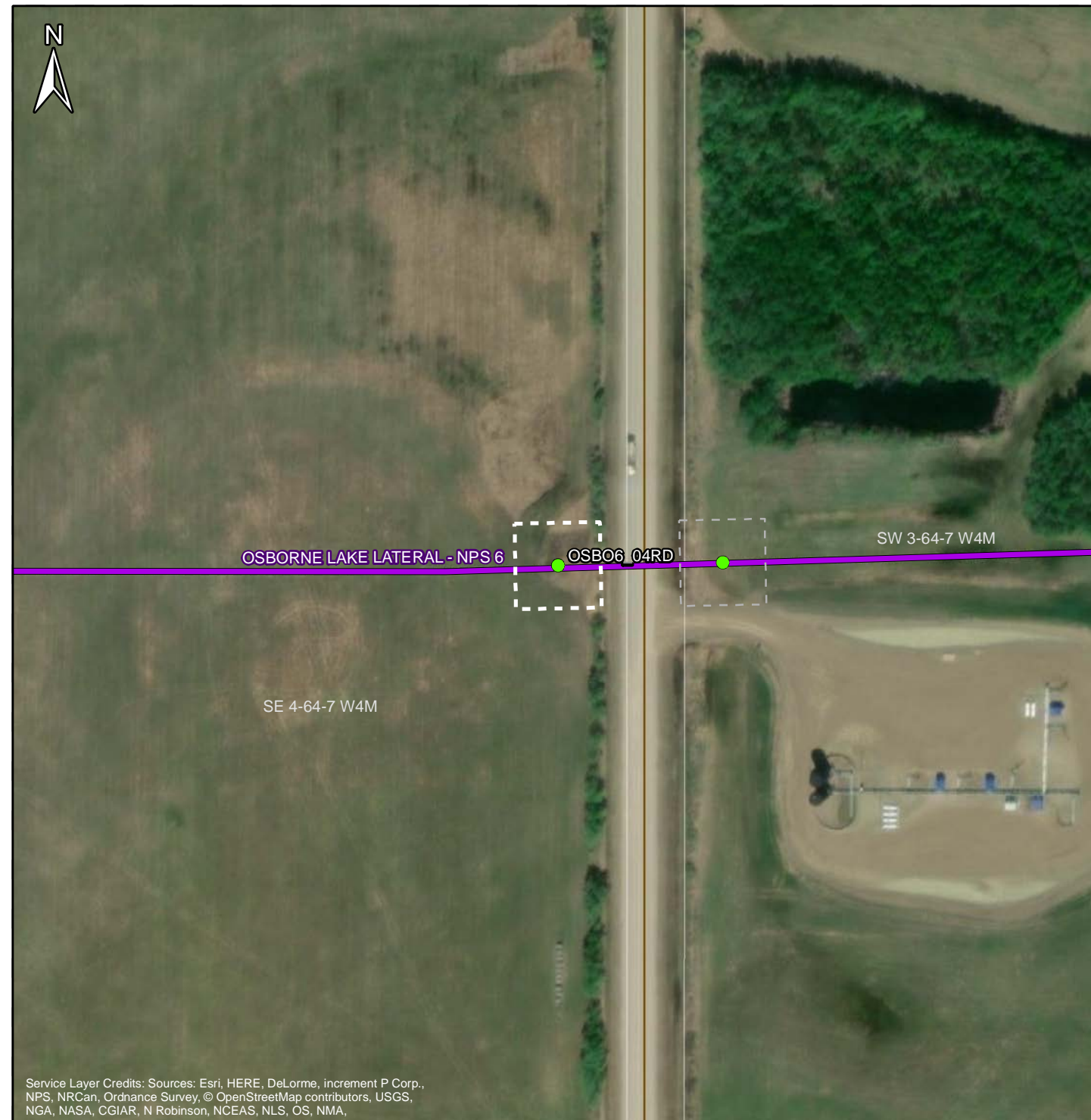


NGTL
2022 ABANDONMENT PROGRAM
OSB02 (Osborne Lake RMS, OSBOMS_02, OSBOMS_01)

M.D. of Bonnyville No. 87, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	OSBO6_04RD	
PROJECT DISTURBANCE AREA ID	OSB05.5	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 4-64-7 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



1:2,000

0 50 100

Metres

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

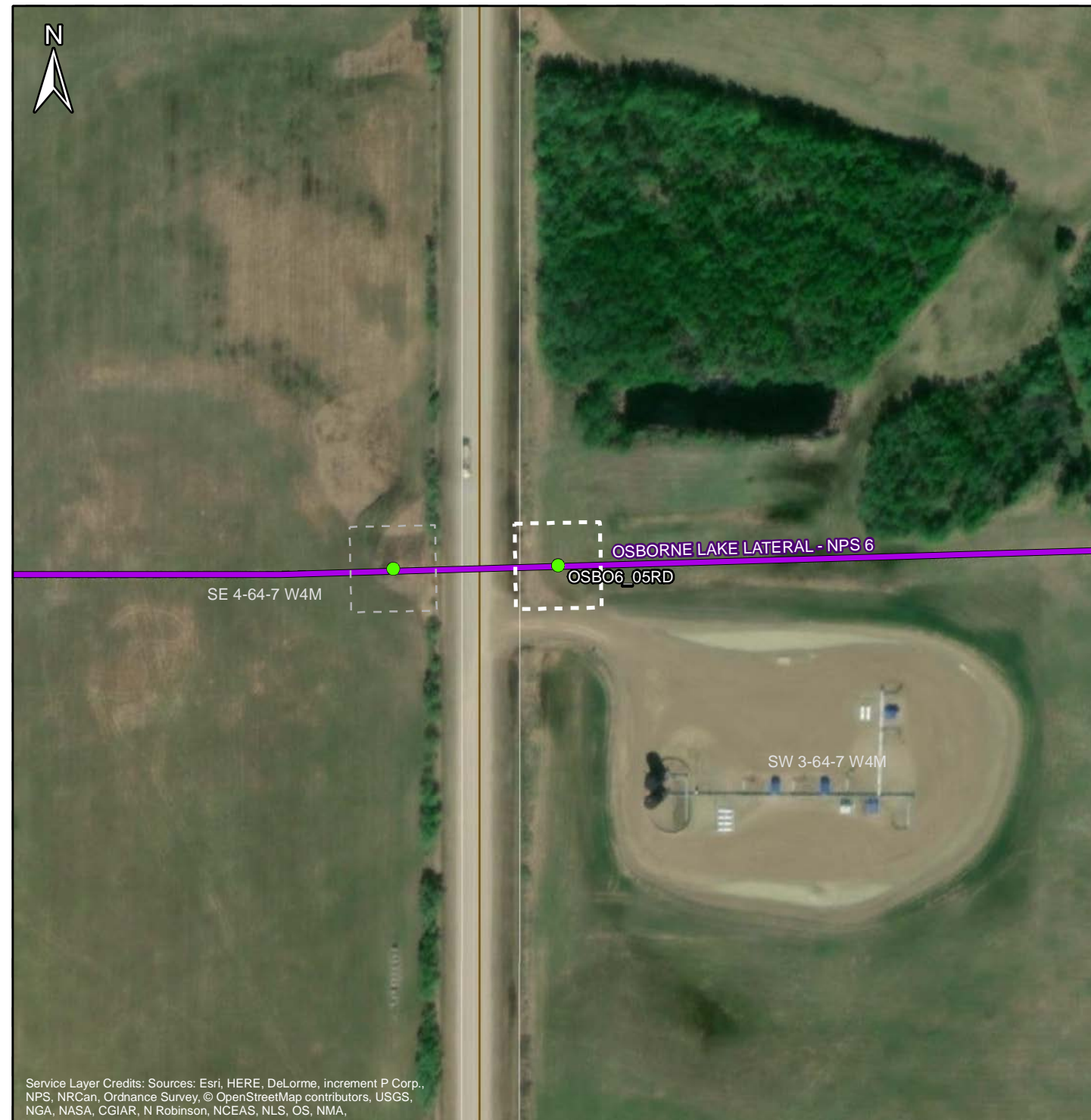
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Sheet Revision: A

NGTL
2022 ABANDONMENT PROGRAM
OSB05.5 (OSBO6_04RD)

M.D. of Bonnyville No. 87, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	OSBO6_05RD	
PROJECT DISTURBANCE AREA ID	OSB05	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 3-64-7 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



1:2,000

0 50 100

Metres

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

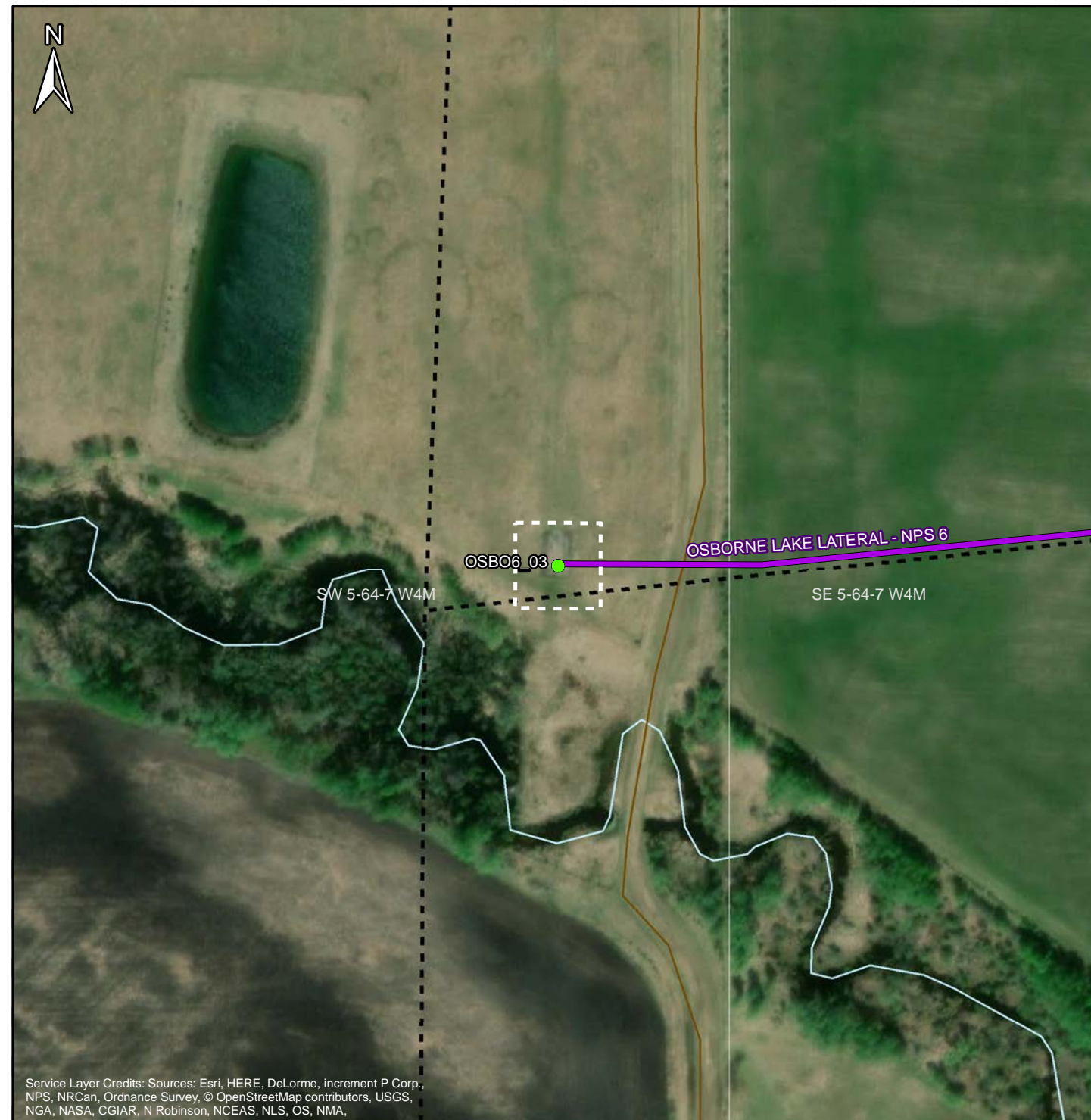
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Sheet Revision: A

NGTL
2022 ABANDONMENT PROGRAM
OSB05 (OSBO6_05RD)

M.D. of Bonnyville No. 87, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

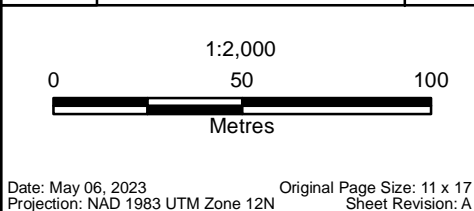
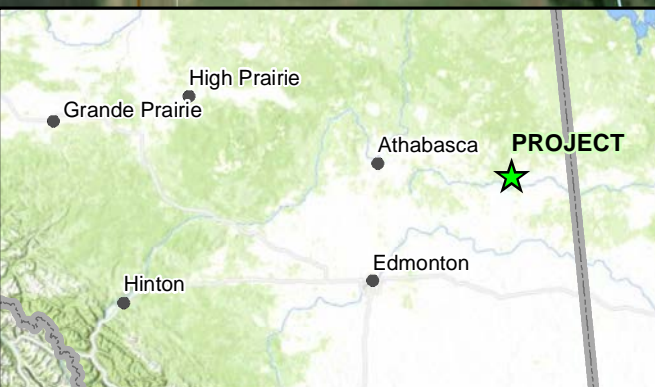


PROGRAM COMPONENT	OSB06_03	
PROJECT DISTURBANCE AREA ID	OSB06	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 5-64-7 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> A watercourse was identified within 30 m of the PDA. No watercourses within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> A fish-bearing watercourses was identified within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Watercourse (Altalis)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

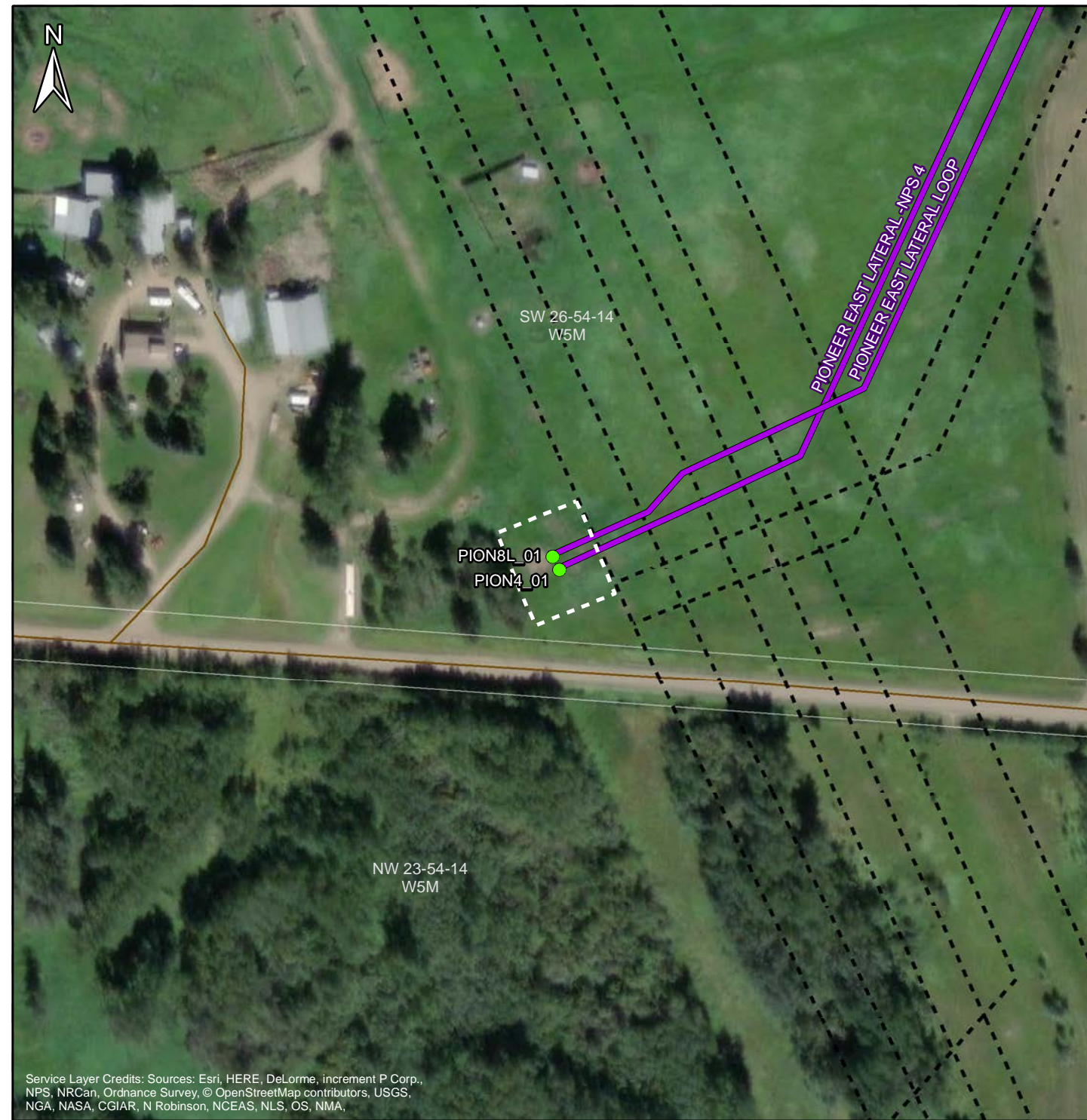


NGTL
2022 ABANDONMENT PROGRAM
OSB06 (OSB06_03)

M.D. of Bonnyville No. 87, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



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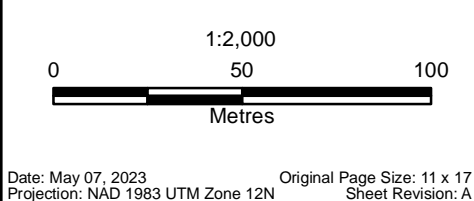
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



PROGRAM COMPONENT	PION4_01, PION8L_01	
PROJECT DISTURBANCE AREA ID	PIO01	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 26-54-14 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Agriculture, Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Brunisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

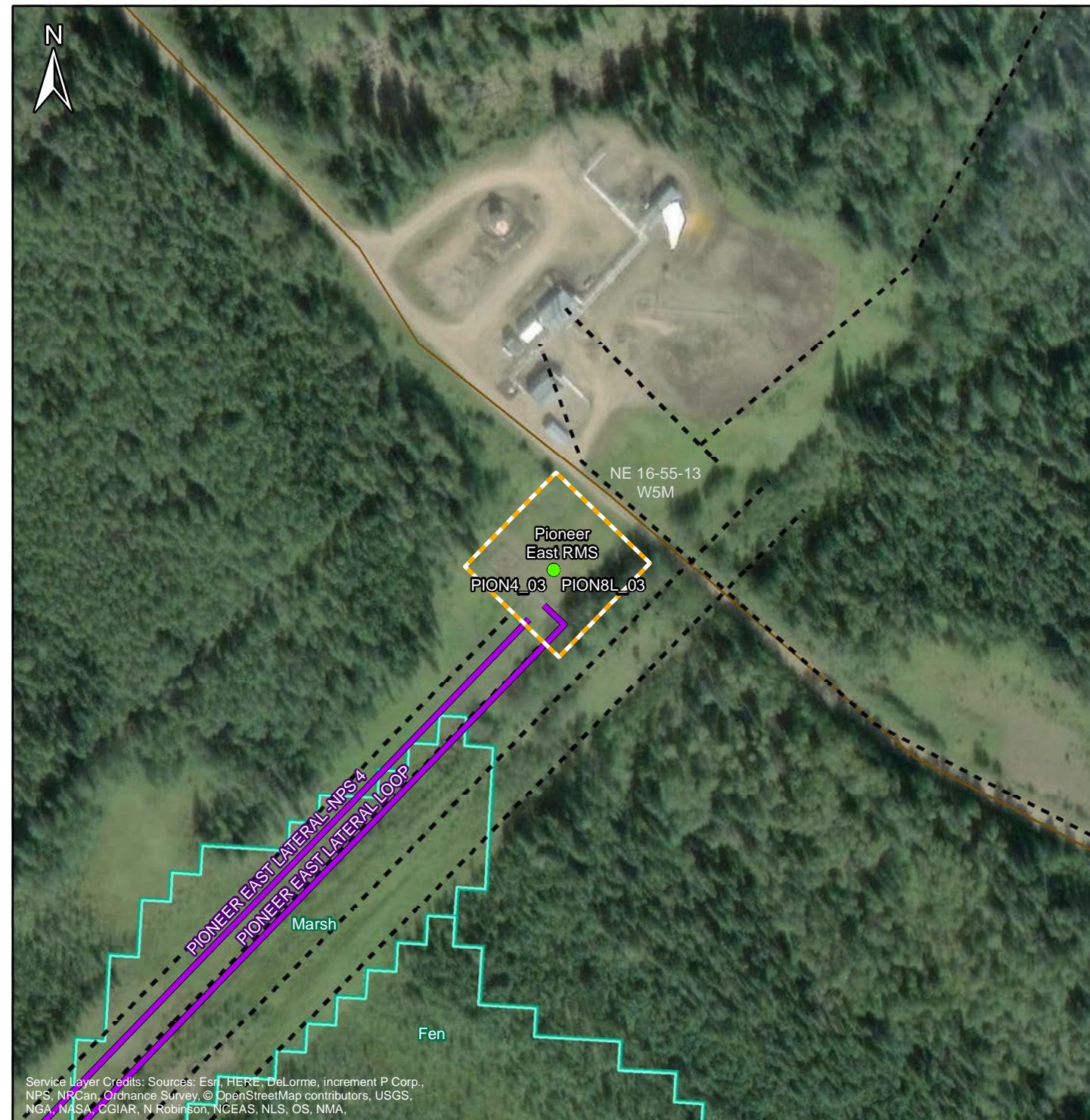


NGTL
2022 ABANDONMENT PROGRAM
PIO01 (PION4_01, PION8L_01)

Yellowhead County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

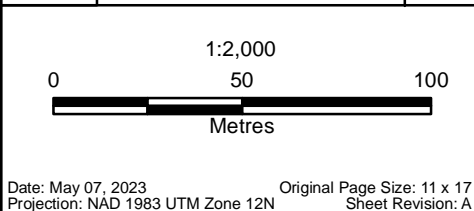


PROGRAM COMPONENT	Pioneer East RMS, PION4_03, PION8L_03	
PROJECT DISTURBANCE AREA ID	PIO08	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway	
LEGAL LAND LOCATION	NE 16-055-13 W5M	
LAND OWNERSHIP	Freehold, Crown	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Regosolic, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>KEY WLD</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within the Key Wildlife and Biodiversity Zone (KWBZ) RAP (January 15 through April 30) to the extent possible. If physical abandonment activities are required within the RAP, NGTL will consult with AEP and implement appropriate mitigation measures to reduce Project effects on wildlife.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> See access and activity restrictions in Key Wildlife and Biodiversity Zones (KWBZ), above. Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

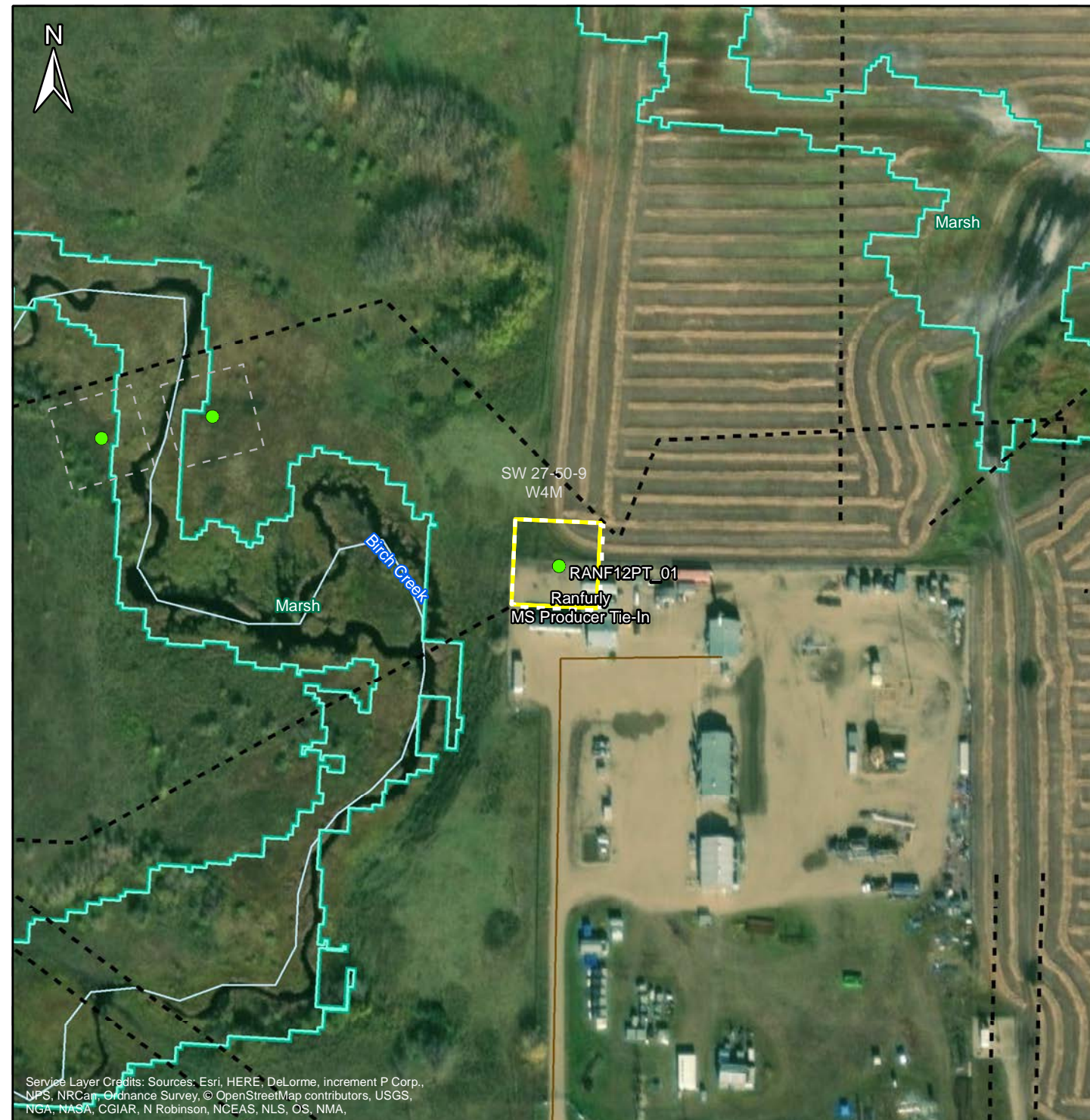


NGTL
2022 ABANDONMENT PROGRAM
PIO08 (Pioneer East RMS, PION4_03, PION8L_03)

Yellowhead County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



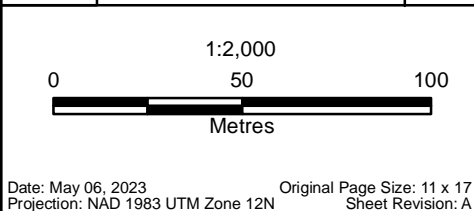
PROGRAM COMPONENT	Ranfurly MS Producer Tie-In, RANF12PT_01	
PROJECT DISTURBANCE AREA ID	RAN01	
PLANNED ACTIVITIES	Isolation (producer line) Isolation at NGTL line	
LEGAL LAND LOCATION	SW 27-50-9 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. A watercourse was identified within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. A fish-bearing watercourses was identified within 100m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. Disturbance to the banks of the waterway will be restored to natural contours and stabilized upon completion of construction. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. Seed disturbed banks and riparian areas with an approved native seed mixture and/or cover crop as specified by the Environmental Inspector(s) or designate(s). The Environmental Inspector(s) or designate(s) will determine onsite whether other restoration methods need to be applied to stabilize banks (e.g., soil wraps, brush layers and matting).
	OTHER	<ul style="list-style-type: none"> Seed riparian and erosion prone areas with a cover crop and/or seed mix that has been approved by the responsible regulator and/ or landowner, as soon as feasible after construction, prior to spring freshet wherever possible

LEGEND

- Isolation Point
- PTI
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

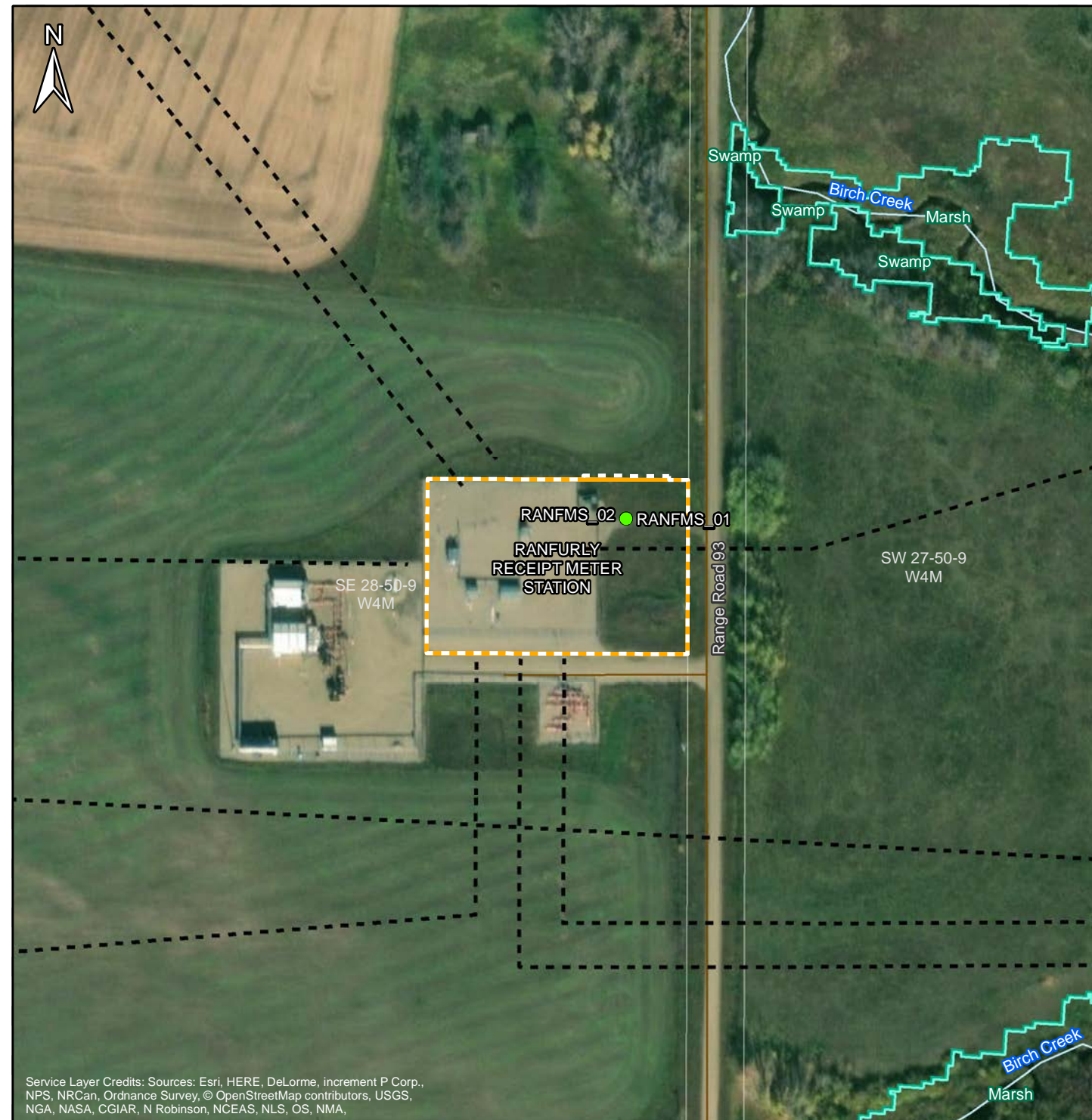


NGTL
2022 ABANDONMENT PROGRAM
RAN01 (Ranfurly MS PTI, RANF12PT_01)
County of Minburn No. 27, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



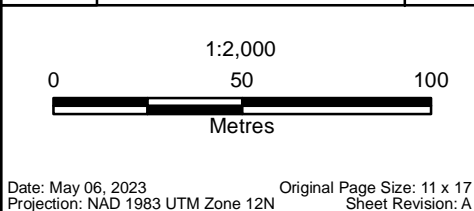
PROGRAM COMPONENT	RANFURLY RECEIPT METER STATION, RANFMS_01, RANFMS_02	
PROJECT DISTURBANCE AREA ID	RAN03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 28-50-9 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. A watercourse was identified within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	SRT OWL <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. Disturbance to the banks of the waterway will be restored to natural contours and stabilized upon completion of construction. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. Seed disturbed banks and riparian areas with an approved native seed mixture and/or cover crop as specified by the Environmental Inspector(s) or designate(s). The Environmental Inspector(s) or designate(s) will determine onsite whether other restoration methods need to be applied to stabilize banks (e.g., soil wraps, brush layers and matting).
	OTHER	<ul style="list-style-type: none"> Seed riparian and erosion prone areas with a cover crop and/or seed mix that has been approved by the responsible regulator and/ or landowner, as soon as feasible after construction, prior to spring freshet wherever possible

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

LEGEND

- Isolation Point
- Meter Station
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

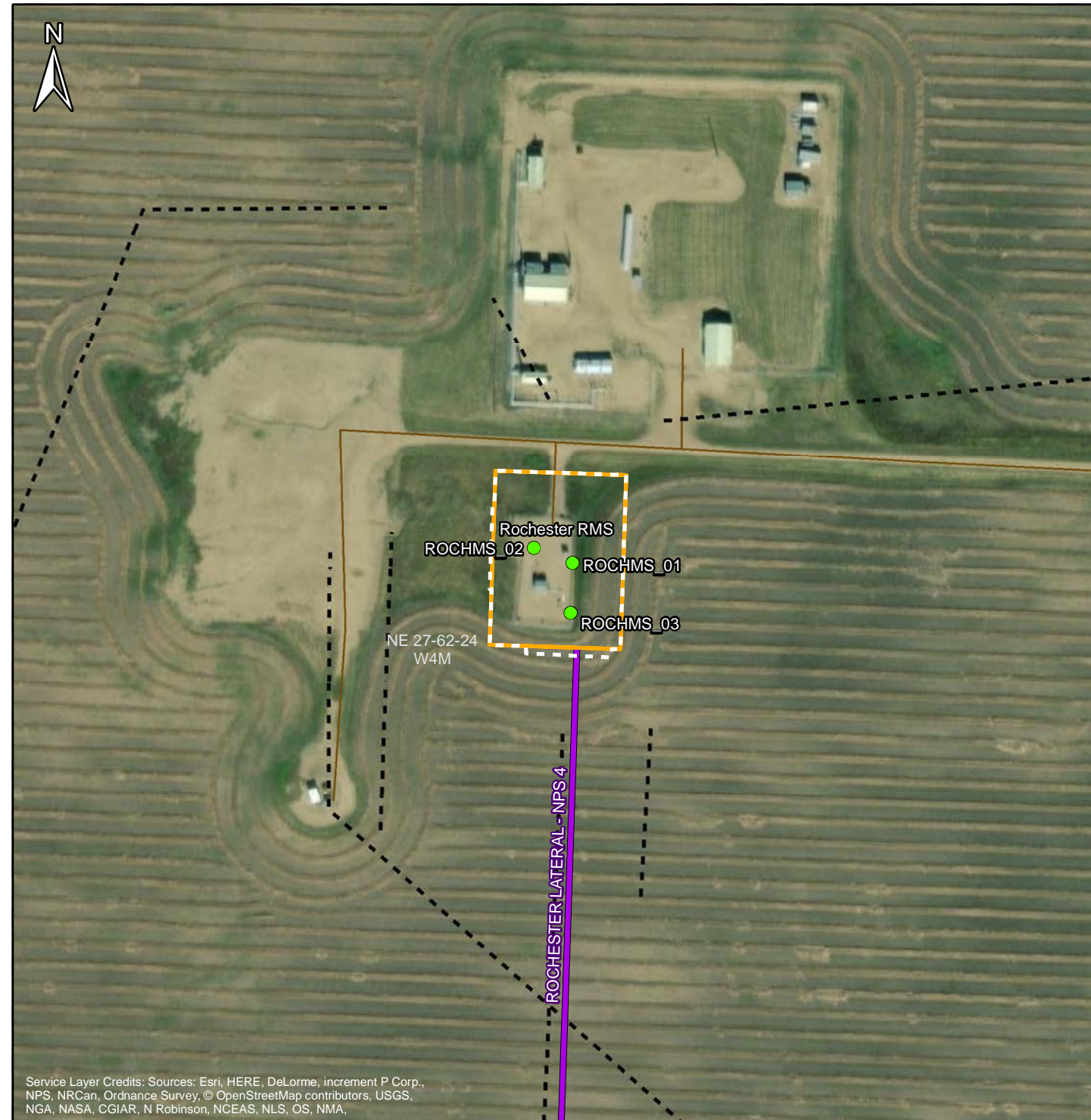
Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
RAN03 (RANFURLY RMS, RANFMS_01, RANFMS_02)
County of Minburn No. 27, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	Rochester RMS, ROCHMS_02, ROCHMS_03, ROCHMS_01	
PROJECT DISTURBANCE AREA ID	ROC01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line/isolation at NGTL line	
LEGAL LAND LOCATION	NE 27-062-24 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic. Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

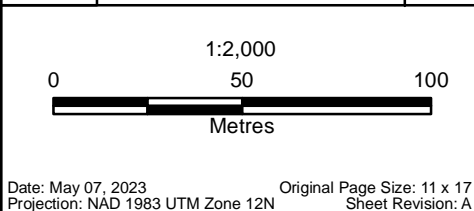
LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, increment P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

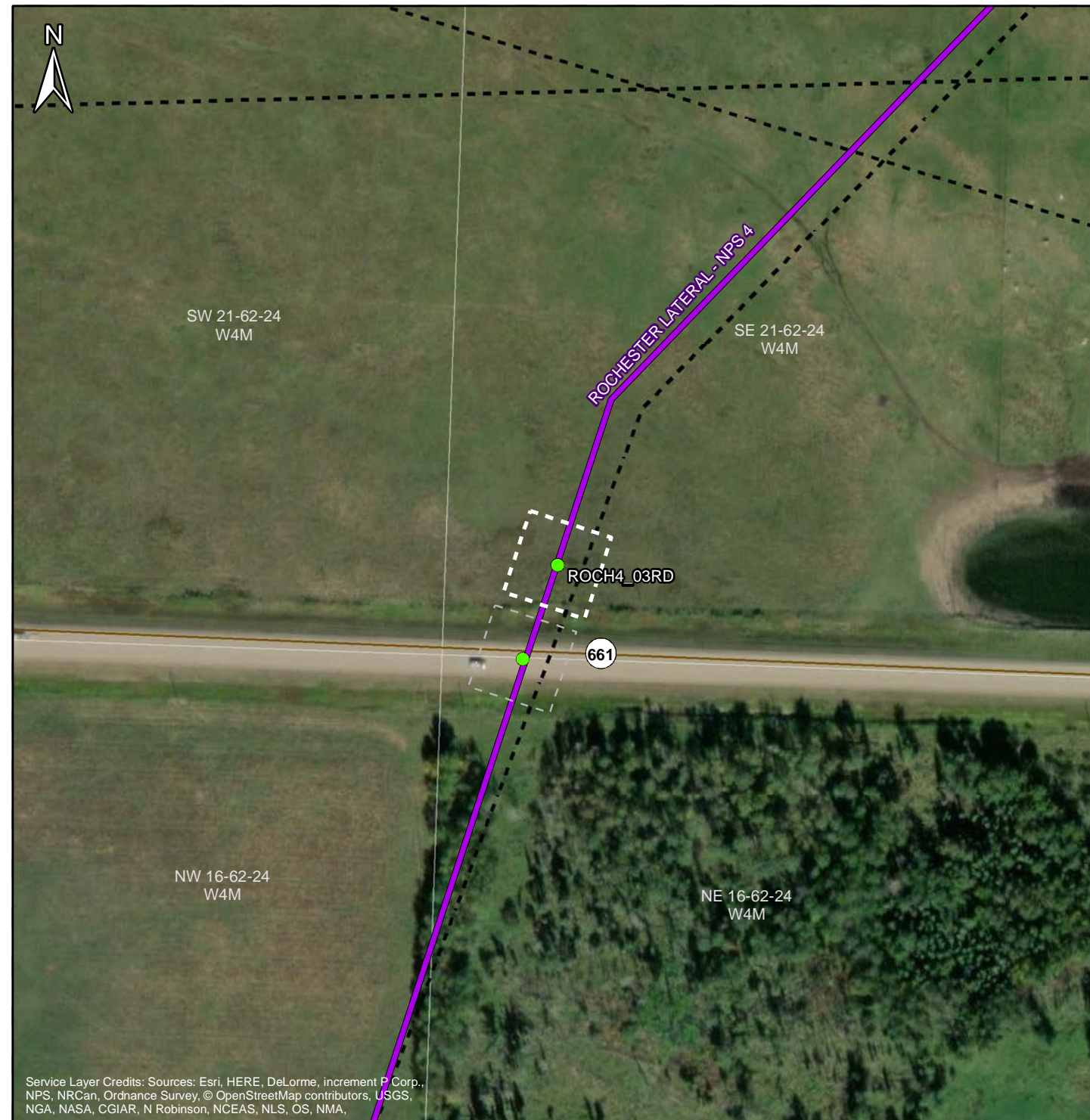


NGTL
2022 ABANDONMENT PROGRAM
ROC01 (Rochester RMS, ROCHMS_02, ROCHMS_03, ROCHMS_01)

Athabasca County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

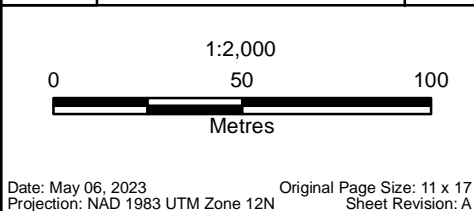


PROGRAM COMPONENT	ROCH4_03RD	
PROJECT DISTURBANCE AREA ID	ROC03.5	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 21-62-24 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Organic, Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



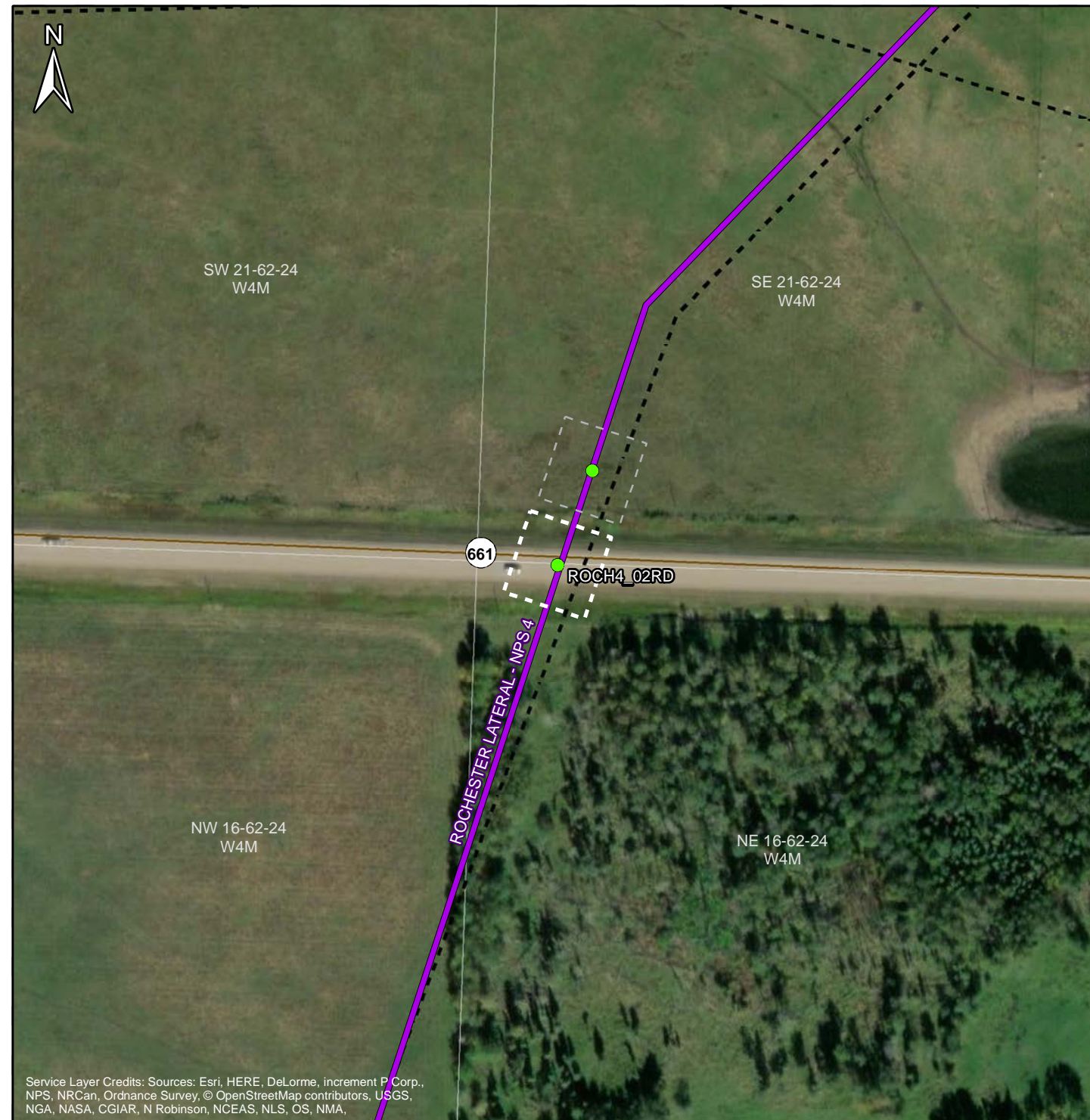
NGTL
2022 ABANDONMENT PROGRAM
ROC03.5 (ROCH4_03RD)

Athabasca County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

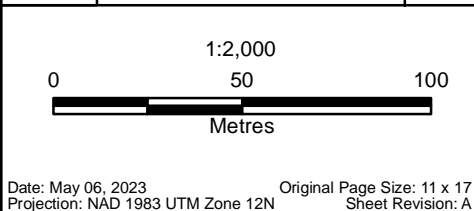


PROGRAM COMPONENT	ROCH4_02RD	
PROJECT DISTURBANCE AREA ID	ROC03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NE 16-62-24 W4M, SE 21-62-24 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Organic, Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
ROC03 (ROCH4_02RD)

Athabasca County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

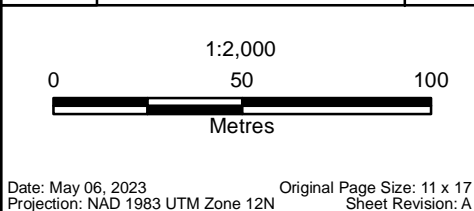


PROGRAM COMPONENT	ROCH4_03	
PROJECT DISTURBANCE AREA ID	ROC04	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 9-62-24 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Organic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Watercourse (Altalis)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

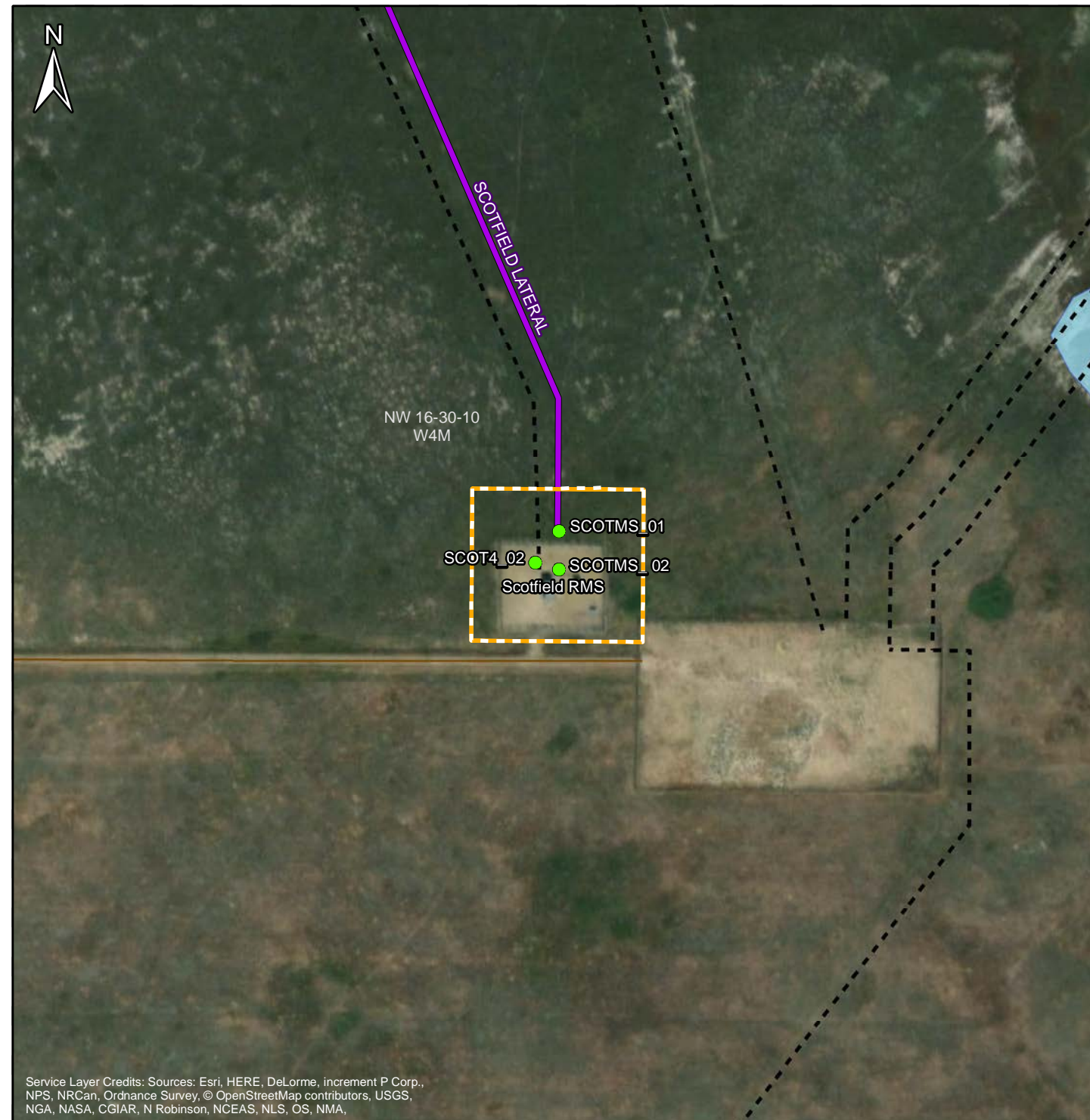


NGTL
2022 ABANDONMENT PROGRAM
ROC04 (ROCH4_03)

Athabasca County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	Scotfield RMS, SCOTMS_01, SCOTMS_02, SCOT4_02	
PROJECT DISTURBANCE AREA ID	SCO01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway	
LEGAL LAND LOCATION	NW 16-030-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

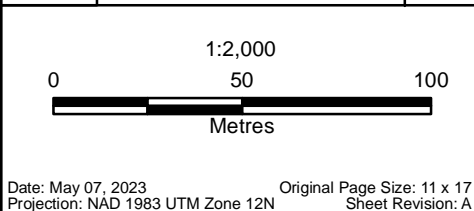
LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Waterbody (Altalis)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

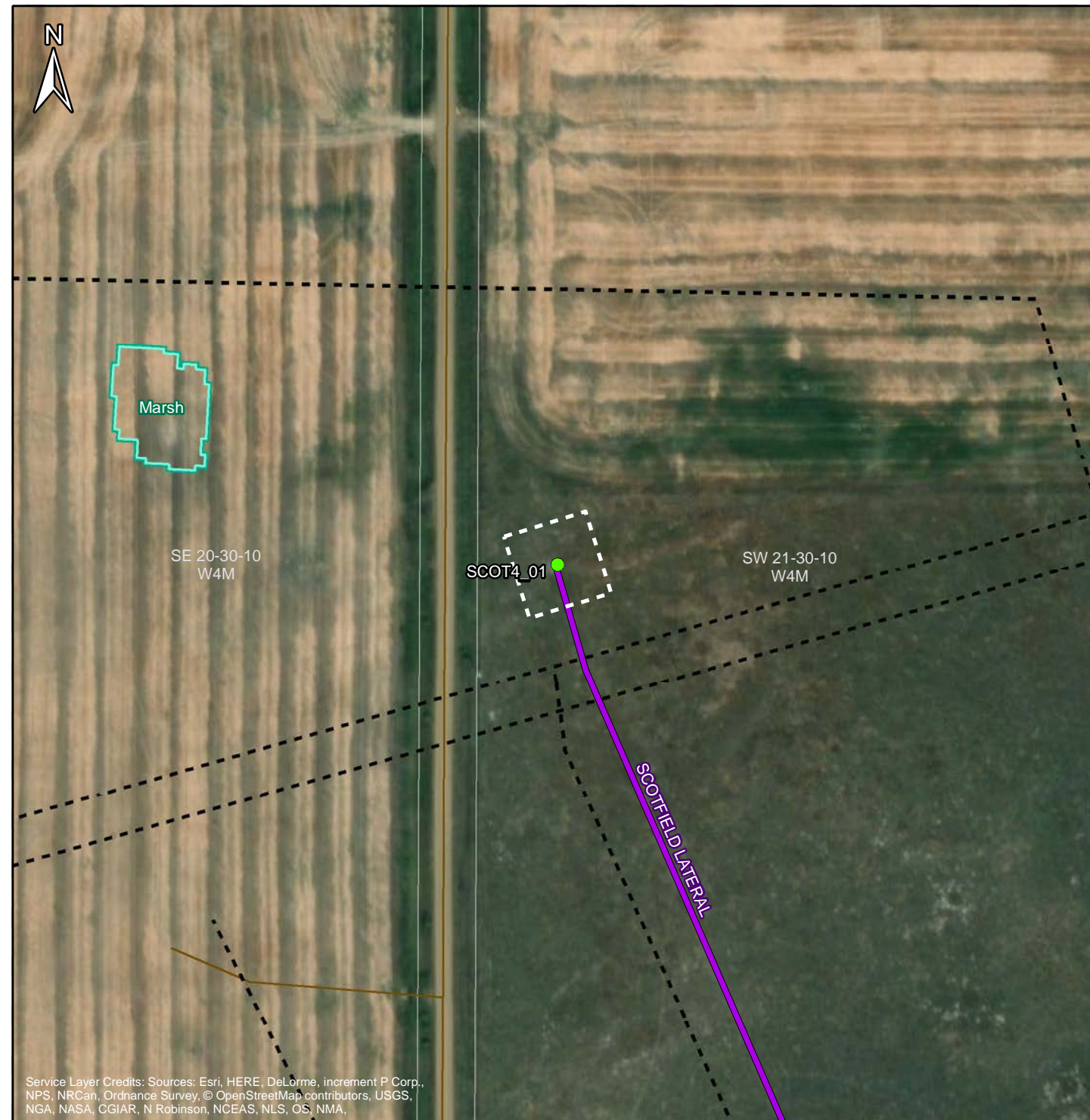


NGTL
2022 ABANDONMENT PROGRAM
SCO01 (Scotfield RMS, SCOTMS_01, SCOTMS_02, SCOT4_02)

ERM
ERM PROJECT NO. 0679315

Special Areas 2, AB
PROJECT NO. TBD
Environmental Site Information Sheet

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

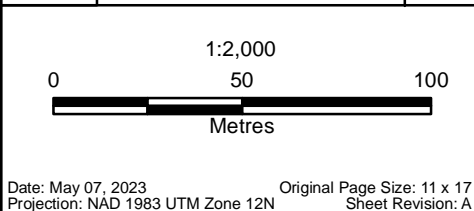


PROGRAM COMPONENT	SCOT4_01	
PROJECT DISTURBANCE AREA ID	SCO03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 21-30-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
SCO03 (SCOT4_01)

Special Areas 2, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



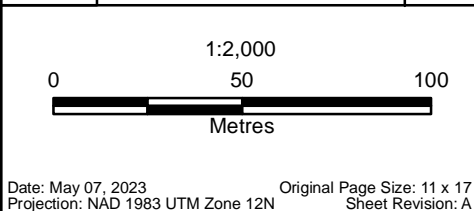
PROGRAM COMPONENT	Sedgewick East RMS, SEDGMS_01E, SEDGMS_02E	
PROJECT DISTURBANCE AREA ID	SED01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line/isolation at NGTL line	
LEGAL LAND LOCATION	NW 23-043-11 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- PDA
- Road
- Electrical Transmission Line
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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NGTL
2022 ABANDONMENT PROGRAM
SED01 (Sedgewick East RMS, SEDGMS_01E, SEDGMS_02E)

Flagstaff County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

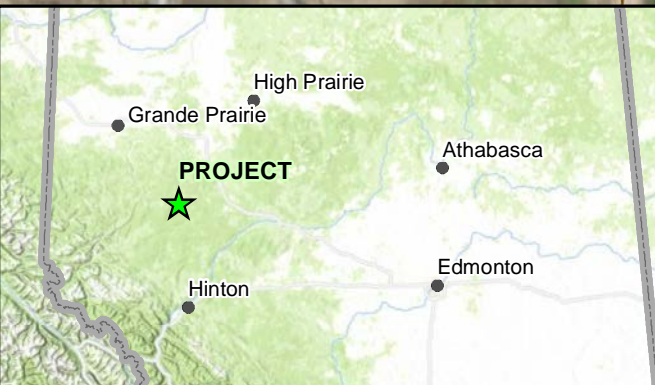


LEGEND

- Isolation Point
- PTI
- PDA
- Other Component PDA
- Road
- Electrical Transmission Line
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	Simonette MS Producer Tie-In, SIMO8PT_01	
PROJECT DISTURBANCE AREA ID	SIM01	
PLANNED ACTIVITIES	Isolation (producer line) Isolation at NGTL line	
LEGAL LAND LOCATION	NW 5-63-25 W5M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> • Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. • Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> • No watercourses within 30 m of the PDA. • No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> • No fish-bearing watercourses within 30m of the PDA. • No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> • No rare plants or rare ecological communities have been identified within the PDA. • No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> • No wetlands have been identified within or intersecting the PDA. • No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> • Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> • Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	• There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	• There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> • In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). • See notes on Page 1.
	ACCESS	• Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> • See notes on Page 1 regarding reclamation. • Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. • Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

1:2,000

Metres

NGTL
2022 ABANDONMENT PROGRAM
SIM01 (Simonette MS PTI, SIMO8PT_01)

M.D. of Greenview No. 16, AB
PROJECT NO. TBD
Environmental Site Information Sheet

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N

Original Page Size: 11 x 17
Sheet Revision: A

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



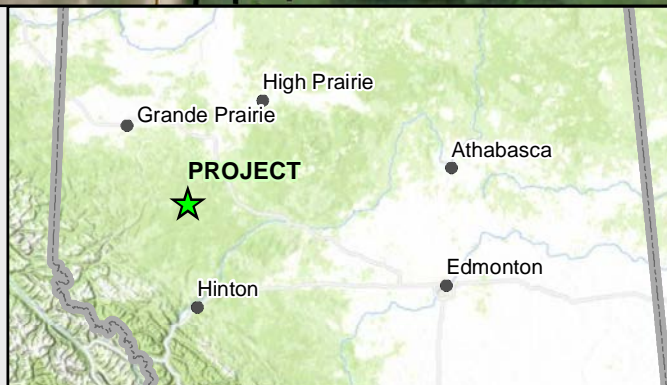
LEGEND

- Isolation Point
- PTI
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	SIMOMS_07	
PROJECT DISTURBANCE AREA ID	SIM02	
PLANNED ACTIVITIES	Isolation (producer line) Isolation at NGTL line	
LEGAL LAND LOCATION	NW 5-63-25 W5M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

1:2,000

0 50 100

Metres

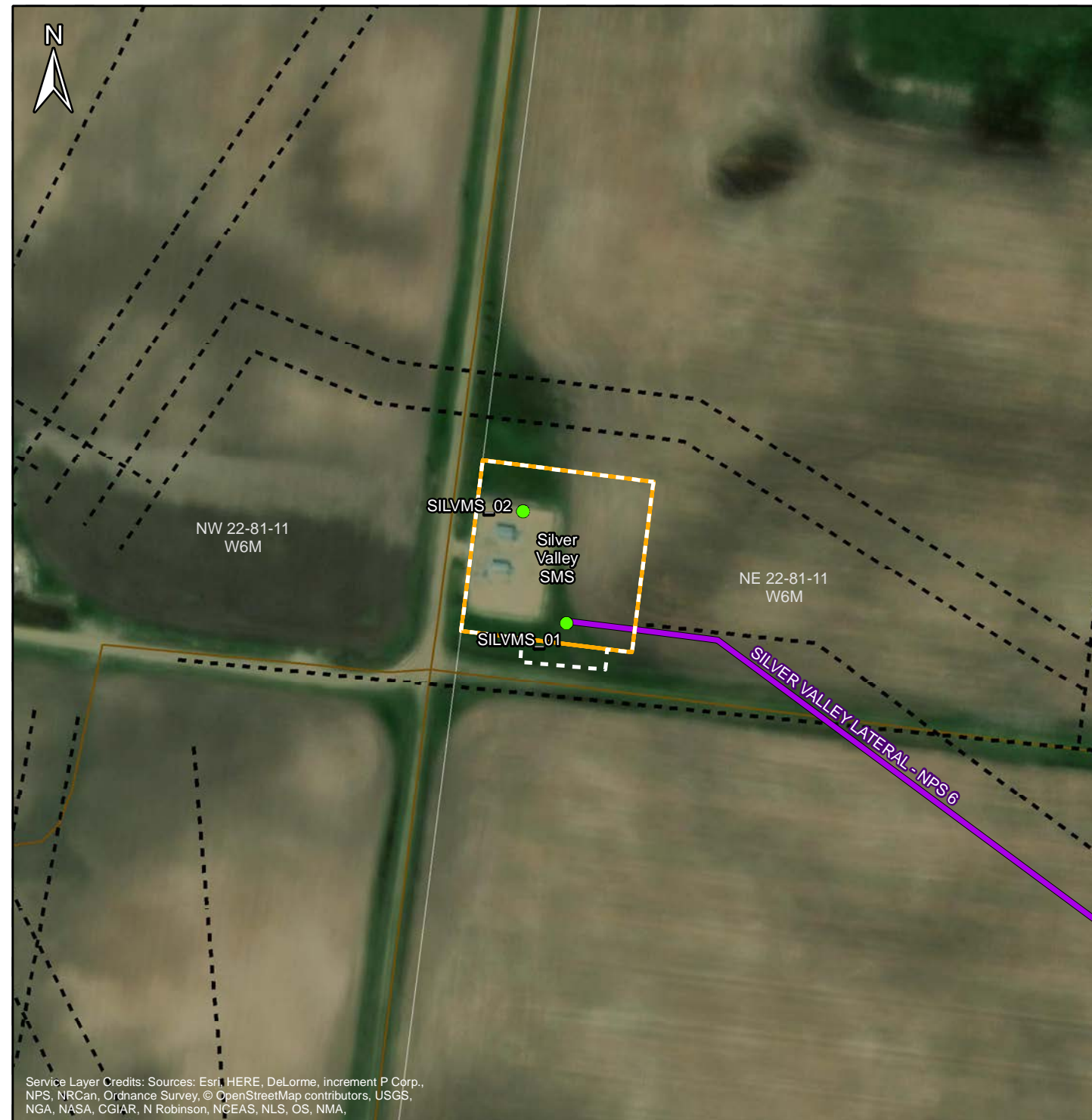
Date: May 07, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

NGTL
2022 ABANDONMENT PROGRAM
SIM02 (SIMOMS_07)

M.D. of Greenview No. 16, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

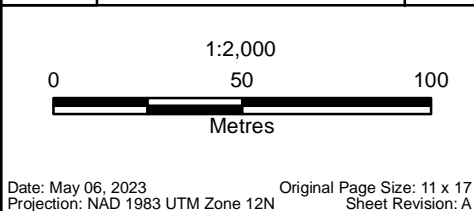


PROGRAM COMPONENT	Silver Valley SMS, SILVMS_02, SILVMS_01	
PROJECT DISTURBANCE AREA ID	SIL01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	NE 22-081-11 W6M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic. Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



NGTL
2022 ABANDONMENT PROGRAM
SIL01 (Silver Valley SMS, SILVMS_02, SILVMS_01)

Saddle Hills County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

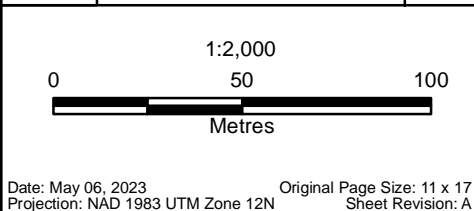


PROGRAM COMPONENT	SILV6_02RD	
PROJECT DISTURBANCE AREA ID	SIL04.5	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NE 22-81-11 W6M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

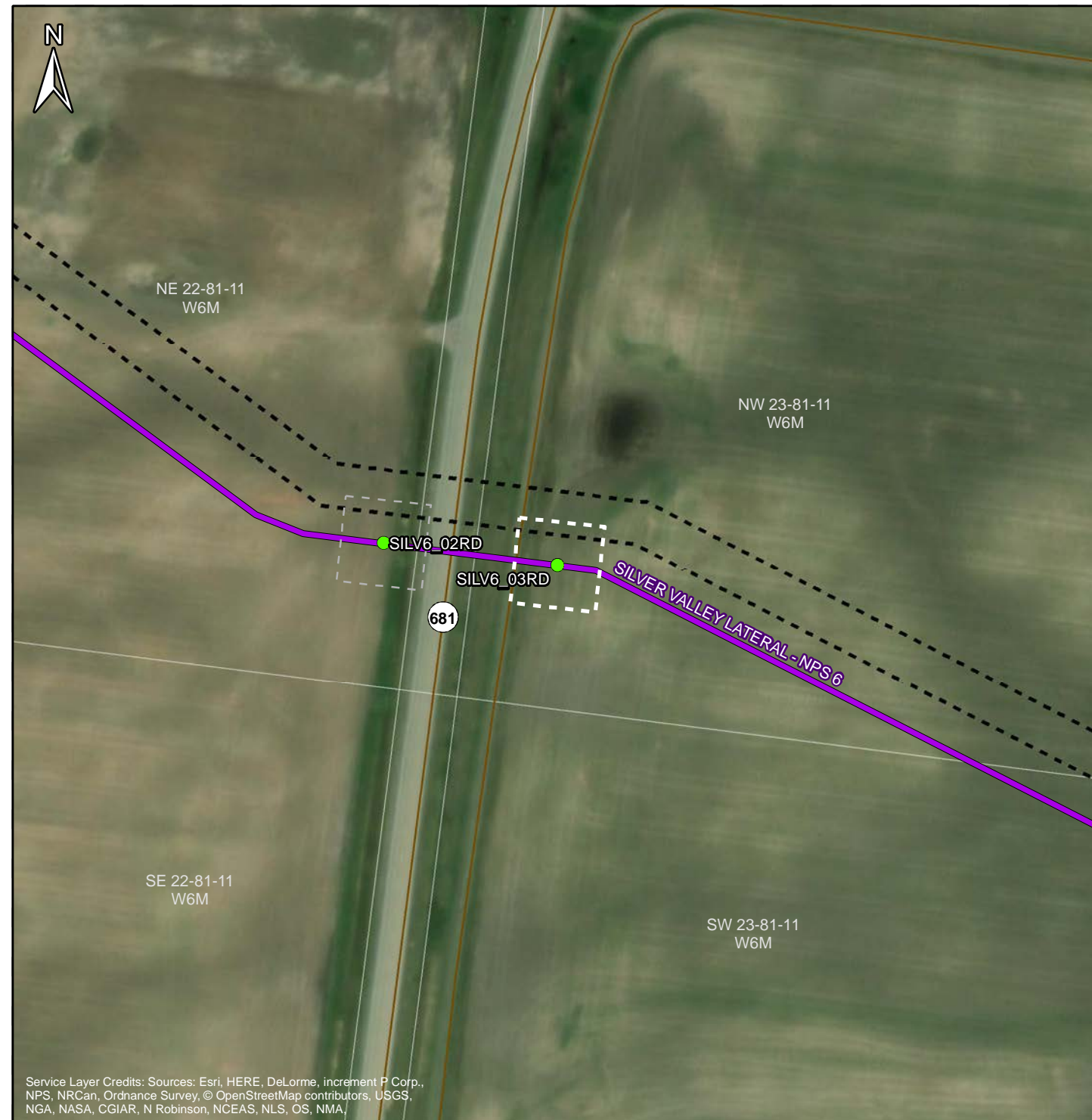


**NGTL
2022 ABANDONMENT PROGRAM
SIL04.5 (SILV6_02RD)**

Saddle Hills County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

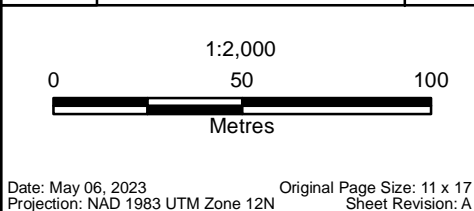


PROGRAM COMPONENT	SILV6_03RD	
PROJECT DISTURBANCE AREA ID	SIL04	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 23-81-11 W6M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

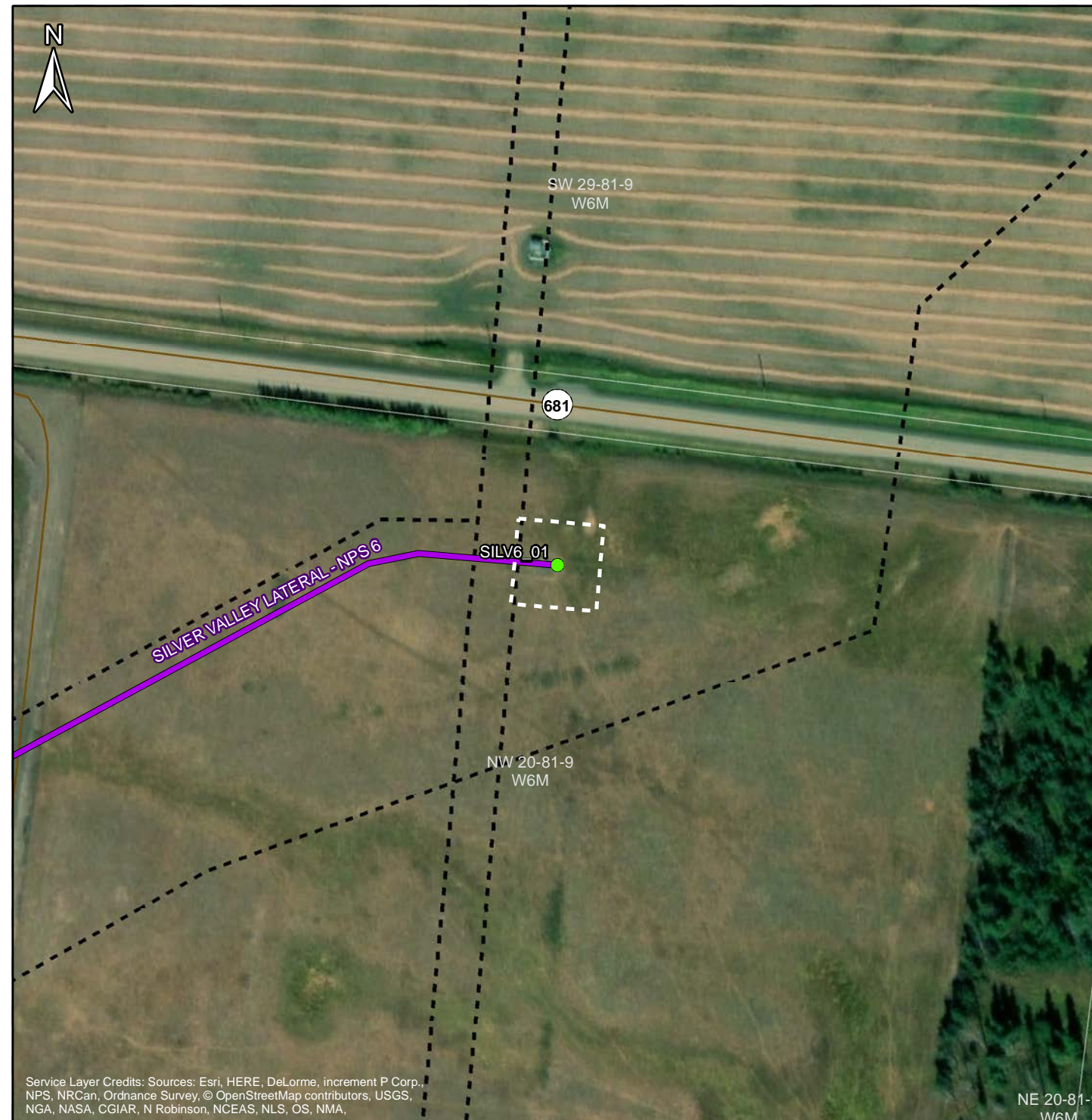


**NGTL
2022 ABANDONMENT PROGRAM
SIL04 (SILV6_03RD)**

Saddle Hills County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	SILV6_01	
PROJECT DISTURBANCE AREA ID	SIL09	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 20-81-9 W6M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>GRIZ</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and reclamation) are scheduled during the bear denning period (October 1 to April 30), a grizzly bear den survey will be undertaken prior to physical abandonment activities in suitable denning habitat within 200 m of a PDA by a Wildlife Resource Specialist, preferably in October or November during suitable weather and snowfall conditions. If an active den is discovered, consult with AEPA to determine appropriate mitigation. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

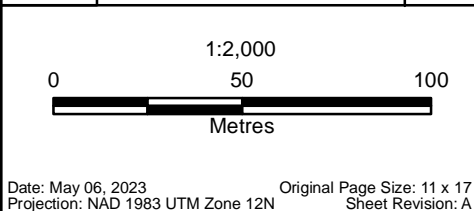
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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NGTL
2022 ABANDONMENT PROGRAM
SIL09 (SILV6_01)

Saddle Hills County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24



PROGRAM COMPONENT	TIDEN6_02	
PROJECT DISTURBANCE AREA ID	TID01	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 23-19-10 W4M, SW 26-19-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity. <p>SNK</p> <ul style="list-style-type: none"> PDAs within sensitive snake habitat range and sensitive snake hibernacula range will be swept daily for snakes prior to activity by appropriately trained personnel if physical abandonment activities occur during the snake active period (April 1 to October 31). Snakes encountered within the work area will be relocated to suitable habitat away from the work area as determined on a site-specific basis. If a snake relocation program is required, a permit for the capture and handling of snakes will be obtained from AEPA prior to commencing the relocation program. Snake relocation will follow appropriate capture and handling guidelines. Reduce vehicle speed limits on all access roads within sensitive snake habitat range (< 50 km/hr on grid roads, and <30 km/hr on gravel roads/trails) during the snake active period (April 1 to October 31) to reduce snake mortality risk.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

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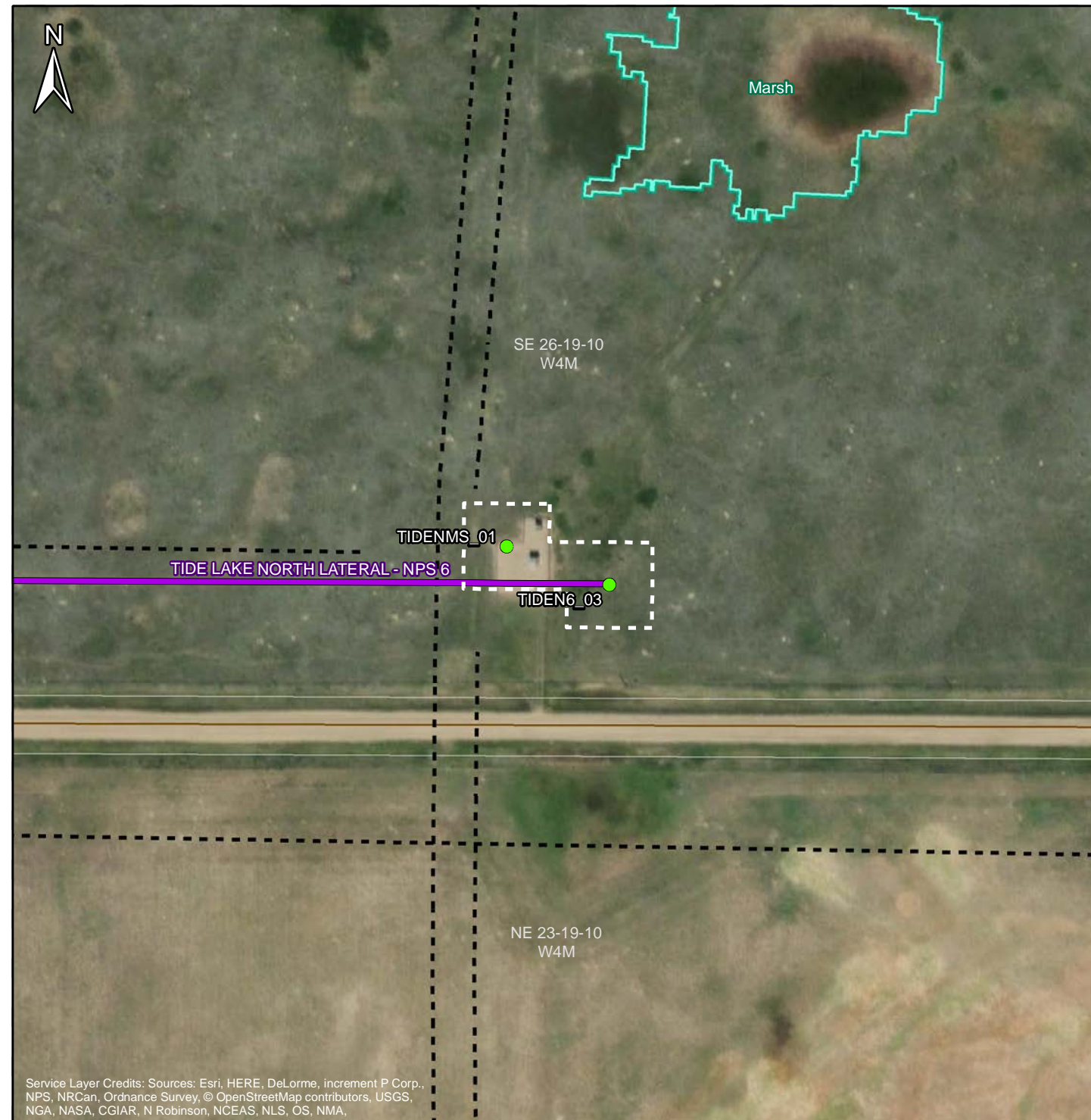
NGTL
2022 ABANDONMENT PROGRAM
TID01 (TIDEN6_02)

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

Date: May 07, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	TIDEN6_03, TIDENMS_01	
PROJECT DISTURBANCE AREA ID	TID02	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 26-19-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity. <p>SNK</p> <ul style="list-style-type: none"> PDA's within sensitive snake habitat range and sensitive snake hibernacula range will be swept daily for snakes prior to activity by appropriately trained personnel if physical abandonment activities occur during the snake active period (April 1 to October 31). Snakes encountered within the work area will be relocated to suitable habitat away from the work area as determined on a site-specific basis. If a snake relocation program is required, a permit for the capture and handling of snakes will be obtained from AEPA prior to commencing the relocation program. Snake relocation will follow appropriate capture and handling guidelines. Reduce vehicle speed limits on all access roads within sensitive snake habitat range (< 50 km/hr on grid roads, and <30 km/hr on gravel roads/trails) during the snake active period (April 1 to October 31) to reduce snake mortality risk.
	HISTORICAL RESOURCES	There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

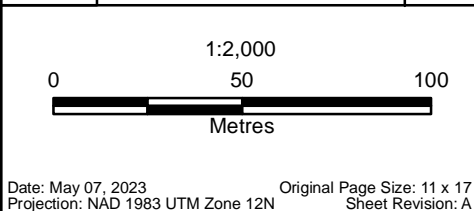
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- - - PDA
- Road
- - - Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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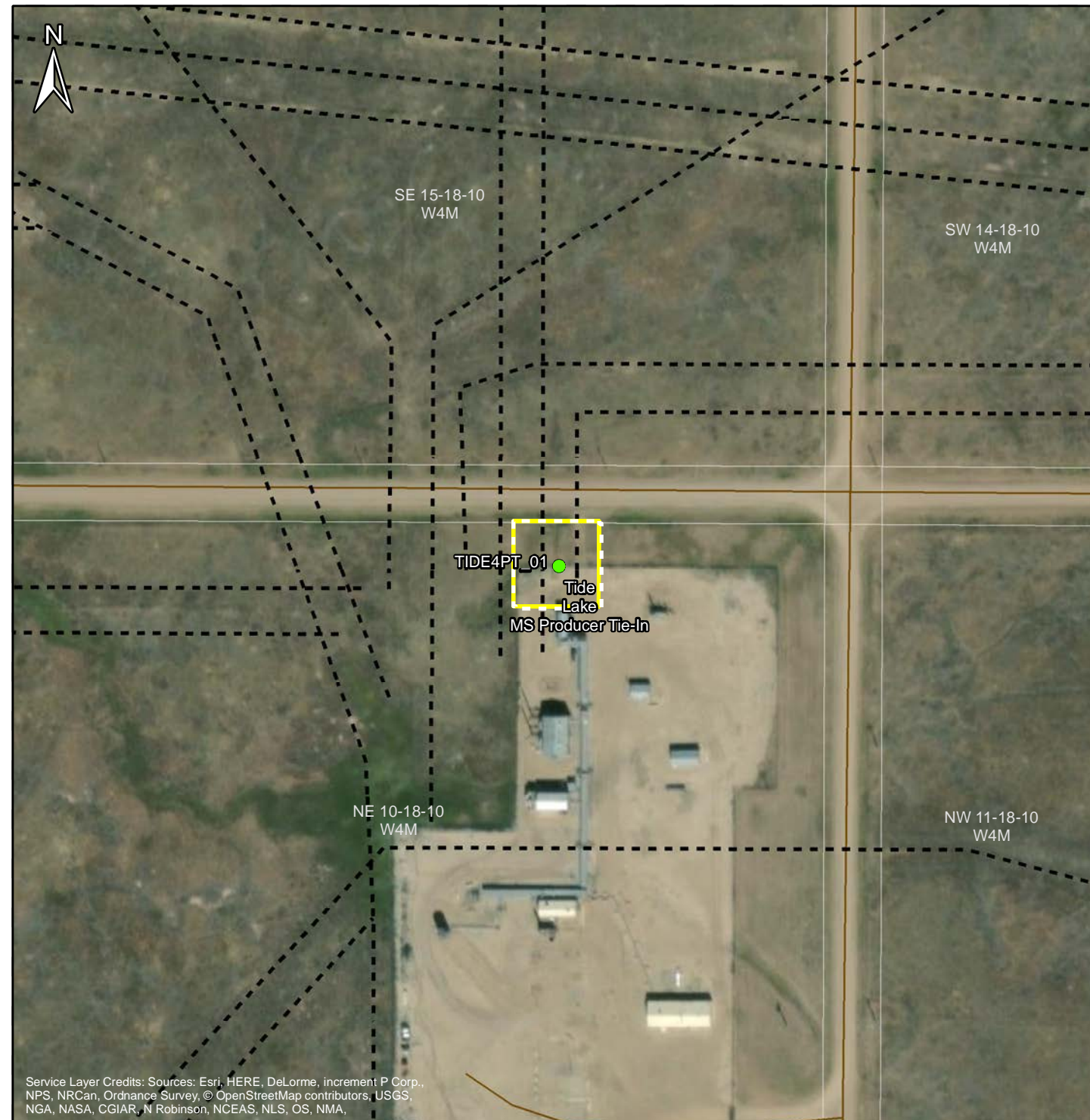


NGTL
2022 ABANDONMENT PROGRAM
TID02 (TIDEN6_03, TIDENMS_01)

ERM
ERM PROJECT NO. 0679315

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	Tide Lake MS Producer Tie-In, TIDE4PT_01	
PROJECT DISTURBANCE AREA ID	TID03	
PLANNED ACTIVITIES	Isolation at NGTL line Isolation (producer line)	
LEGAL LAND LOCATION	NE 10-18-10 W4M, SE 15-18-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations. 	
RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. 	
OTHER		

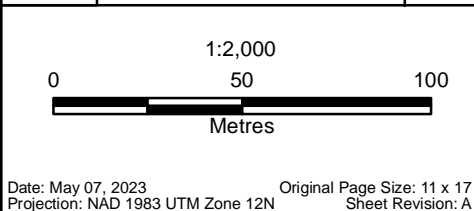
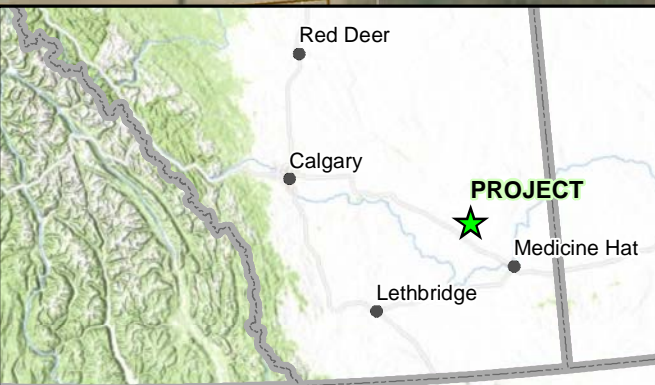
LEGEND

- Isolation Point
- PTI
- PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24



NGTL
2022 ABANDONMENT PROGRAM
TID03 (Tide Lake MS PTI, TIDE4PT_01)

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

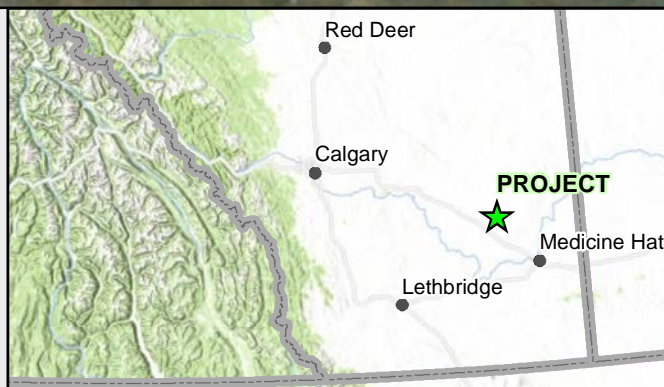
THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- PDA
- Road
- Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



PROGRAM COMPONENT	TIDEMS_01	
PROJECT DISTURBANCE AREA ID	TID04	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 14-18-10 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>SLEND</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations. 	
RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use. 	
OTHER		

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

1:2,000

0 50 100

Metres

Date: May 07, 2023
Projection: NAD 1983 UTM Zone 12N

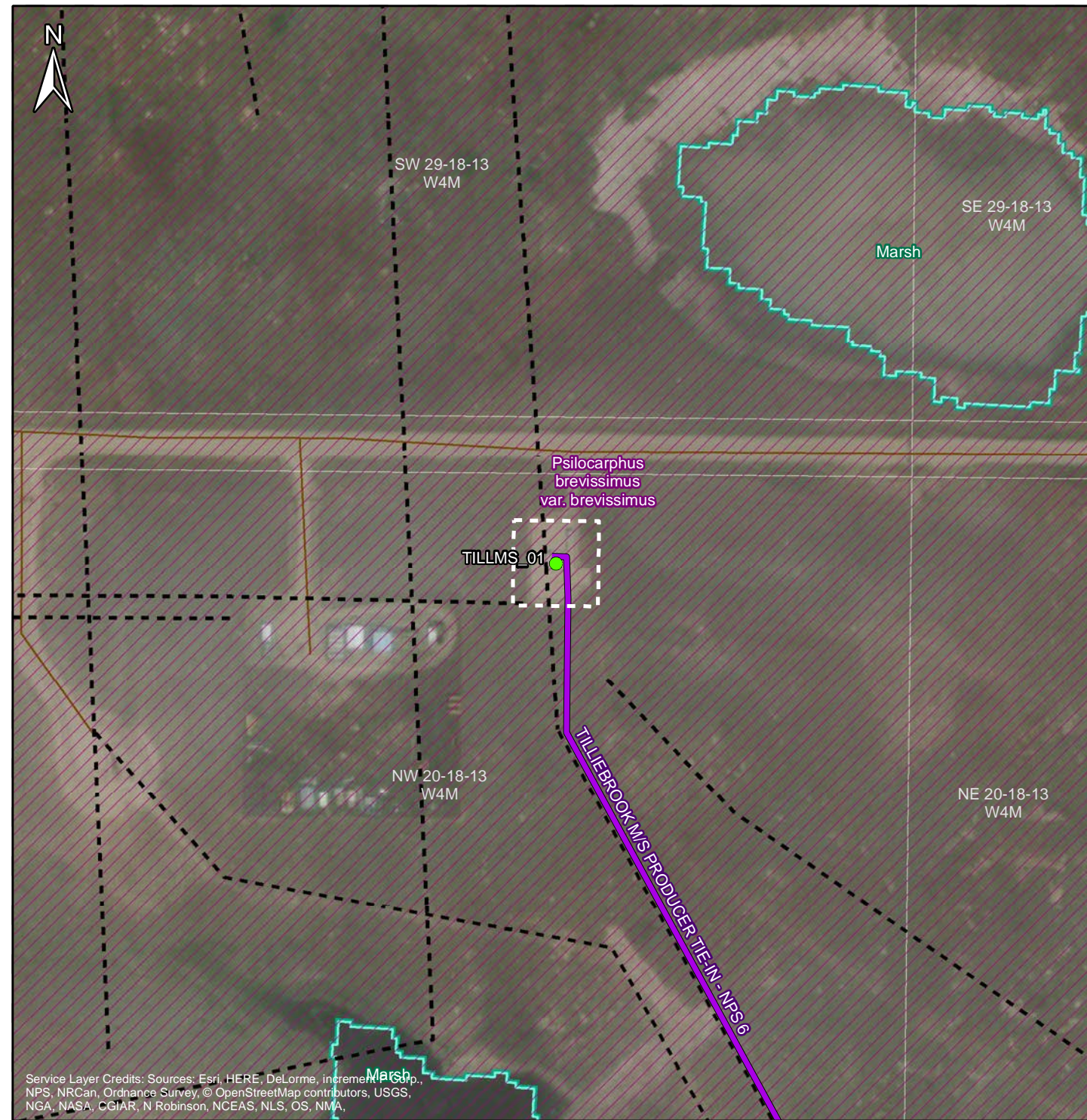
Original Page Size: 11 x 17
Sheet Revision: A

NGTL
2022 ABANDONMENT PROGRAM
TID04 (TIDEMS_01)

Cypress County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

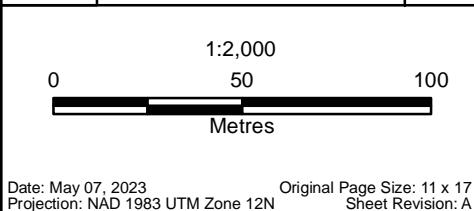


PROGRAM COMPONENT	TILLMS_01	
PROJECT DISTURBANCE AREA ID	TIL01	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 20-18-13 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonetzic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>DWARF</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- - - PDA
- Road
- - - Existing Pipeline (AER)
- Historical Rare Plant Occurrence – ACIMS
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

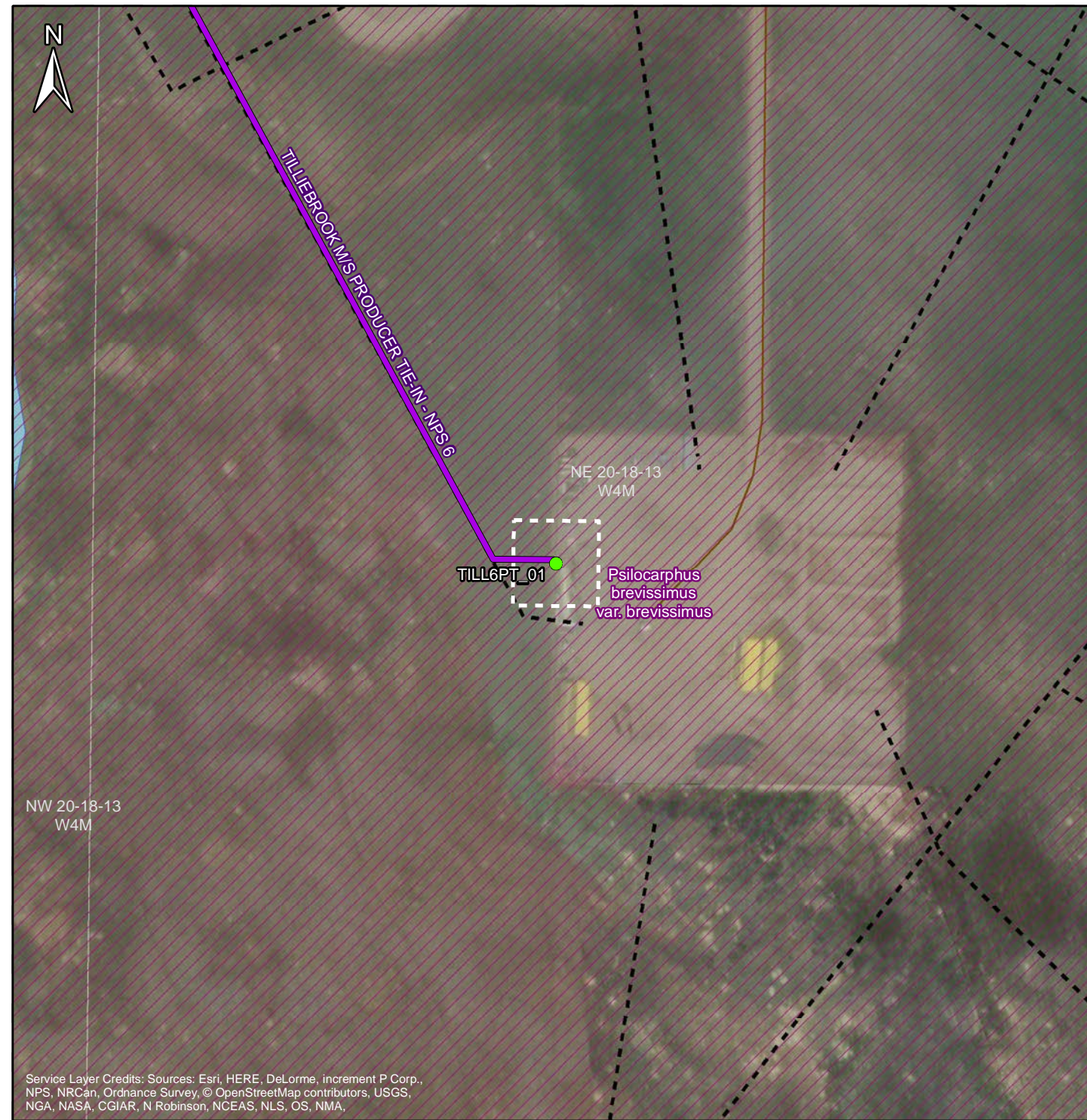


**NGTL
2022 ABANDONMENT PROGRAM
TIL01 (TILLMS_01)**

County of Newell, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

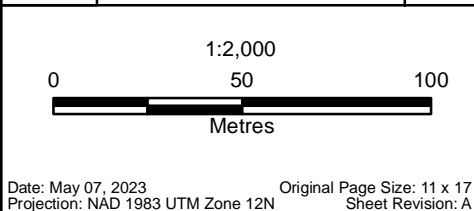


PROGRAM COMPONENT	TILL6PT_01	
PROJECT DISTURBANCE AREA ID	TIL03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NE 20-18-13 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Solonchic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<p>DWARF</p> <ul style="list-style-type: none"> S2 ranked rare plants or rare ecological communities have been identified within the PDA. S2 ranked rare plants or rare ecological communities have been identified within the 100 m of the PDA. Clearly mark identified rare plant locations prior to the start of Project construction. Review mitigation for rare plants / rare ecological communities with Contractor personnel in advance of construction to ensure there is full understanding of the procedures involved.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>BUR OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 500 m of an identified burrowing owl nest from April 1 to August 15. Avoid physical abandonment activities within (including clearing and reclamation) 100 m of an identified burrowing owl nest from August 16 to March 31. <p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15. <p>AMB</p> <ul style="list-style-type: none"> Where physical abandonment activities (including clearing and/or reclamation) are scheduled to occur during the amphibian active period (April 15 to September 30, depending on species and seasonal conditions) within 100 m of potential breeding and foraging habitat (i.e., suitable breeding wetlands) or within the sensitive amphibian range, pre-abandonment amphibian sweeps will be completed daily prior to activity.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Historical Rare Plant Occurrence – ACIMS
- Mapped Waterbody (Altalis)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

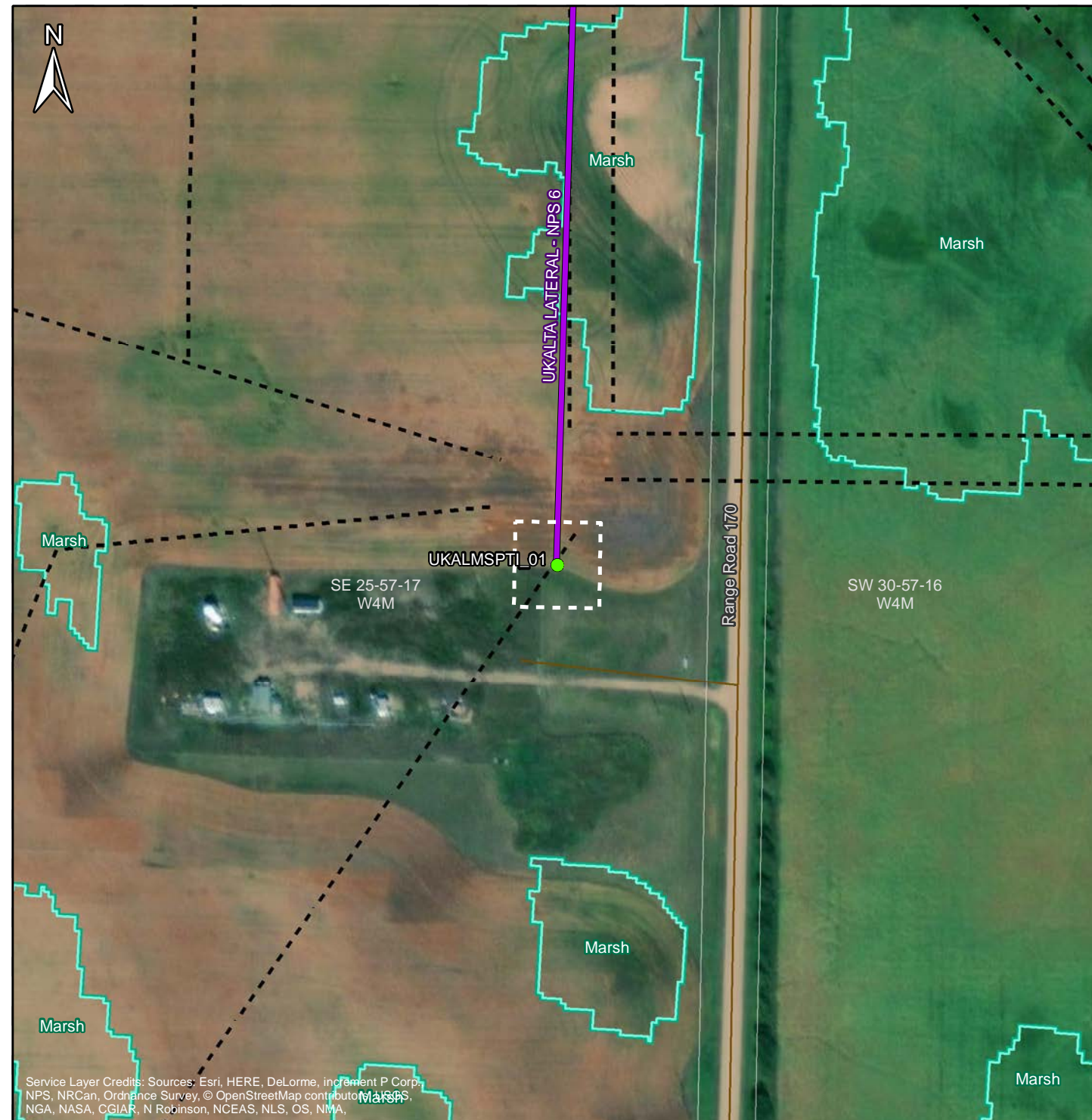


NGTL
2022 ABANDONMENT PROGRAM
TIL03 (TILL6PT_01)

County of Newell, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	UKALMSPTI_01	
PROJECT DISTURBANCE AREA ID	UKA01	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 25-57-17 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

1:2,000

0 50 100
Metres

NGTL
2022 ABANDONMENT PROGRAM
UKA01 (UKALMSPTI_01)

Lamont County, AB

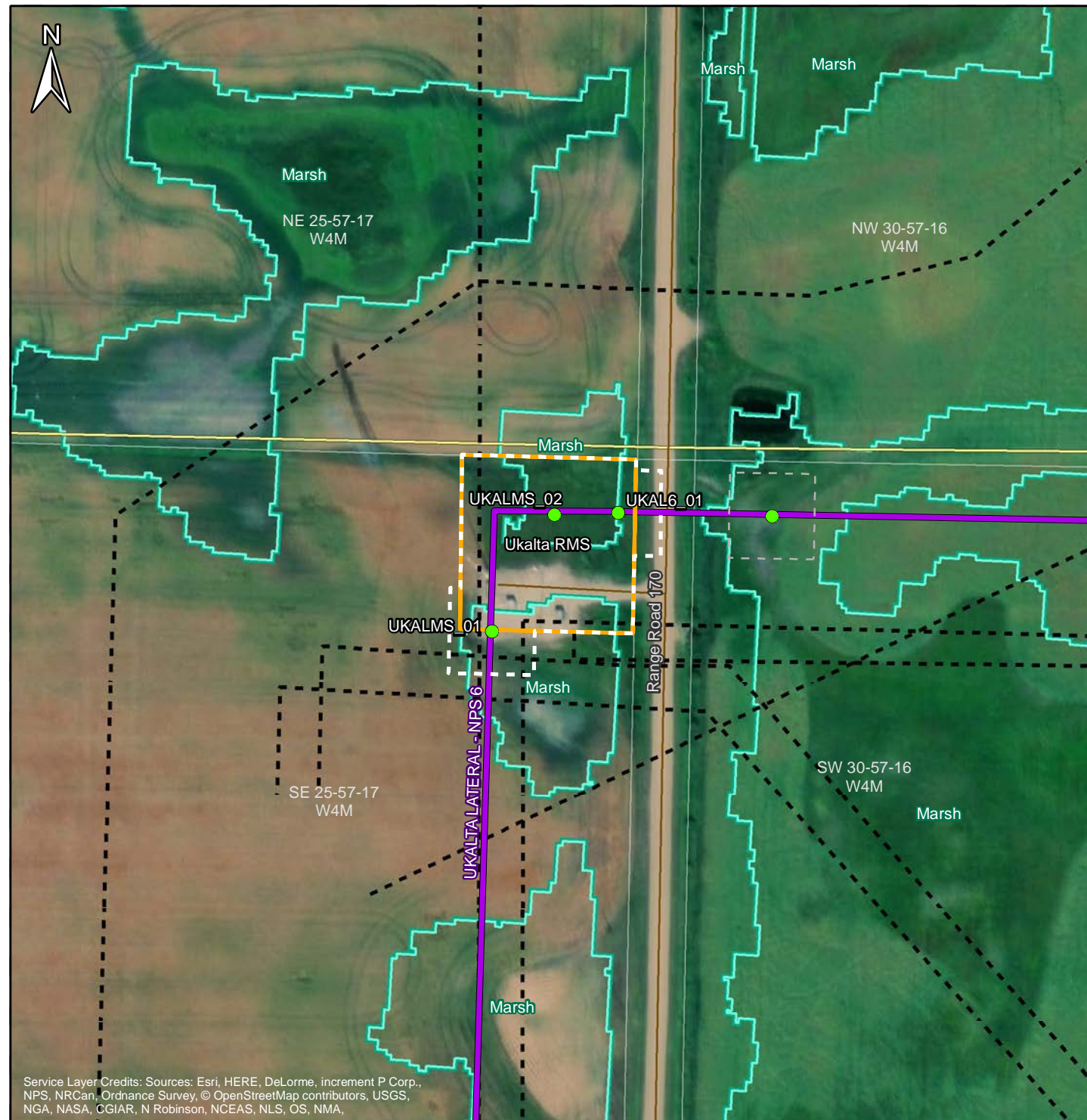
PROJECT NO. TBD

Environmental Site Information Sheet

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Electrical Transmission Line
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	Ukalta RMS, UKALMS_01 , UKALMS_02, UKAL6_01	
PROJECT DISTURBANCE AREA ID	UKA02	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line/isolation at NGTL line	
LEGAL LAND LOCATION	SW 30-57-16 W4M, SE 25-57-17 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	SRT OWL Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

1:2,000

0 50 100

Metres

NGTL

2022 ABANDONMENT PROGRAM

UKA02 (Ukalta RMS, UKALMS_01 , UKALMS_02, UKAL6_01)

Lamont County, AB

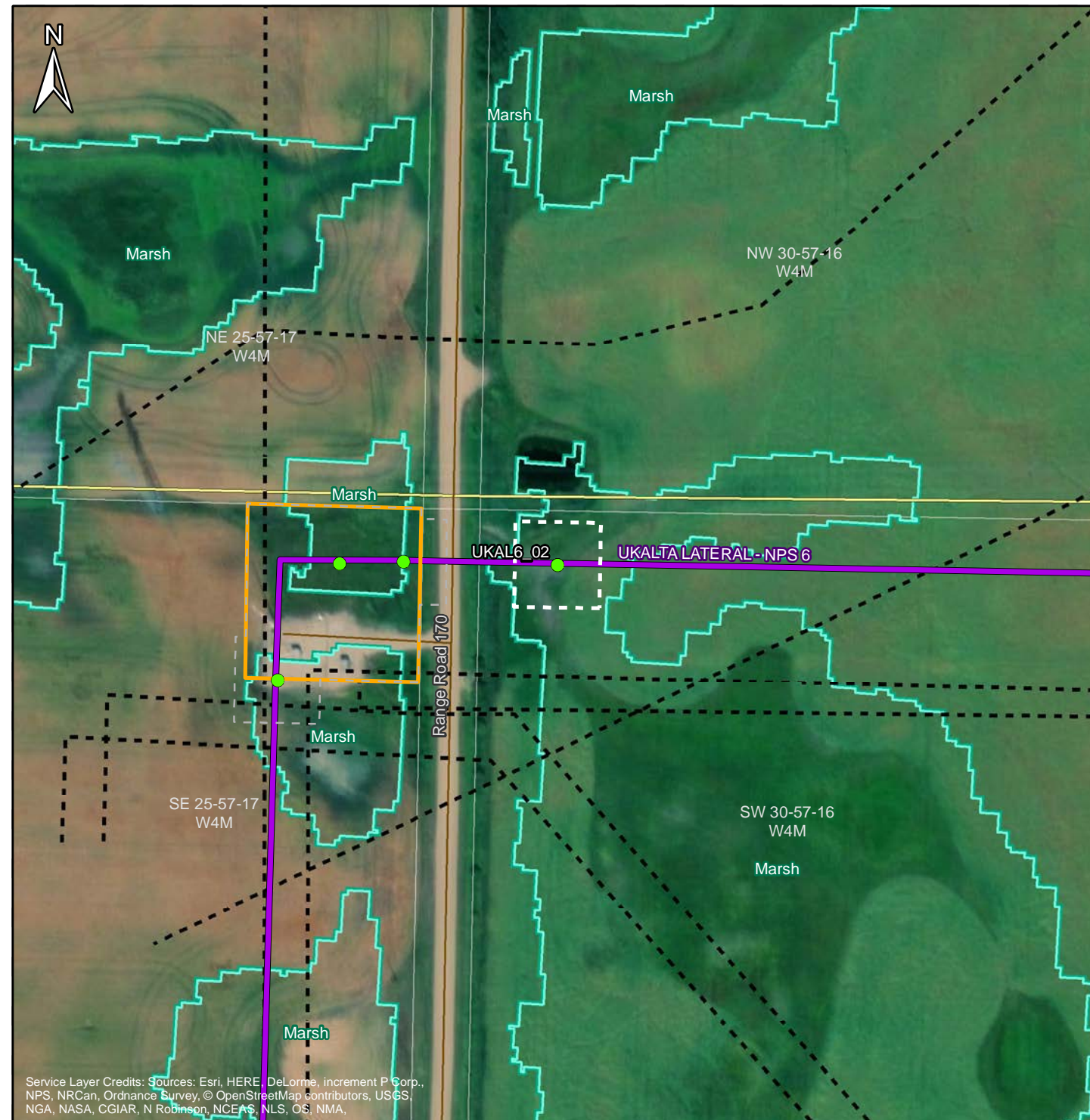
PROJECT NO. TBD

Environmental Site Information Sheet

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



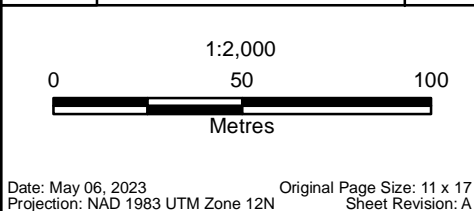
PROGRAM COMPONENT	UKAL6_02	
PROJECT DISTURBANCE AREA ID	UKA03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 30-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Electrical Transmission Line
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA.



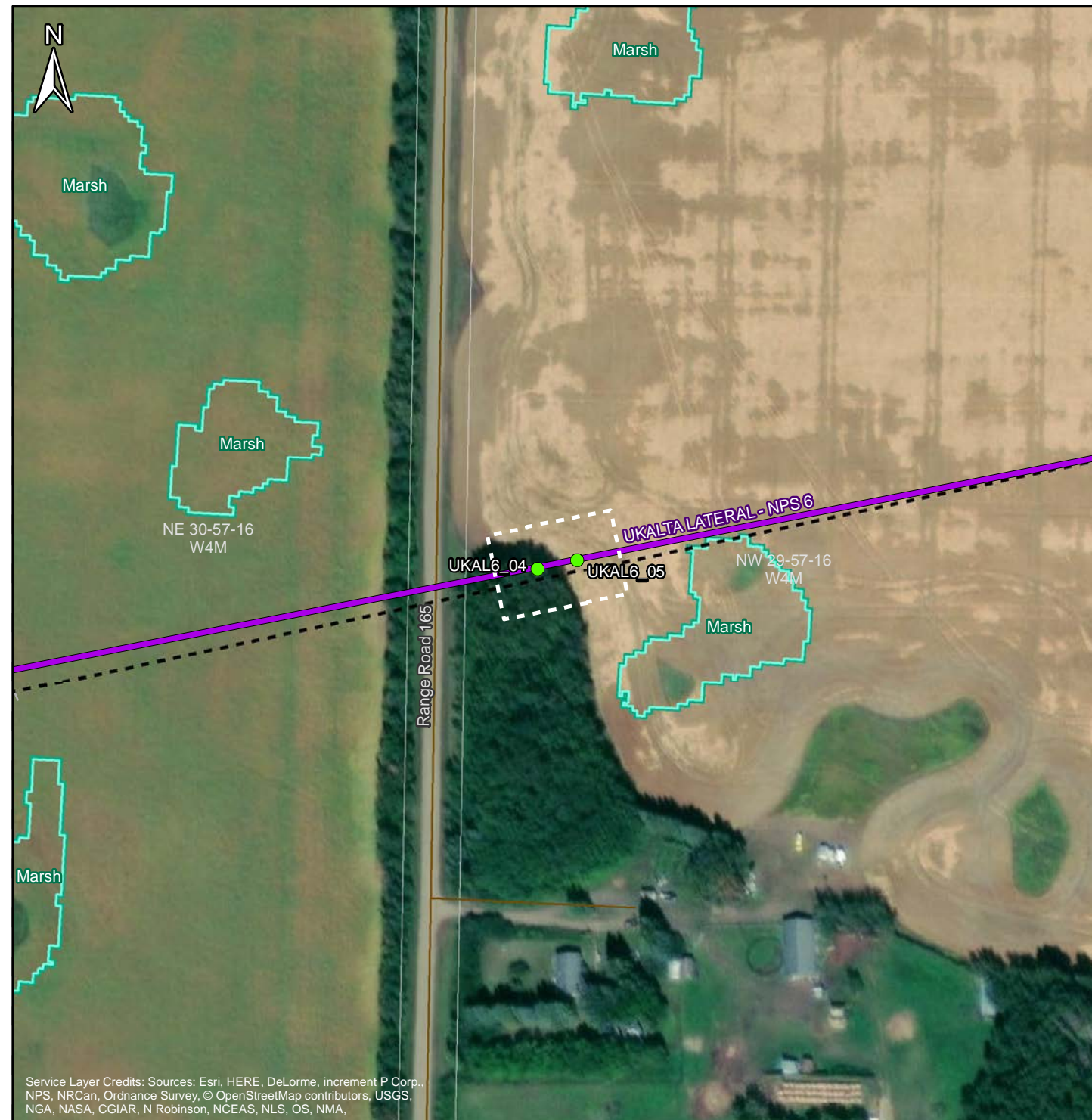
NGTL
2022 ABANDONMENT PROGRAM
UKA03 (UKAL6_02)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 06, 2023
Projection: NAD 1983 UTM Zone 12N
Original Page Size: 11 x 17
Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incentiv P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,



PROGRAM COMPONENT	UKAL6_04 , UKAL6_05	
PROJECT DISTURBANCE AREA ID	UKA06	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 29-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

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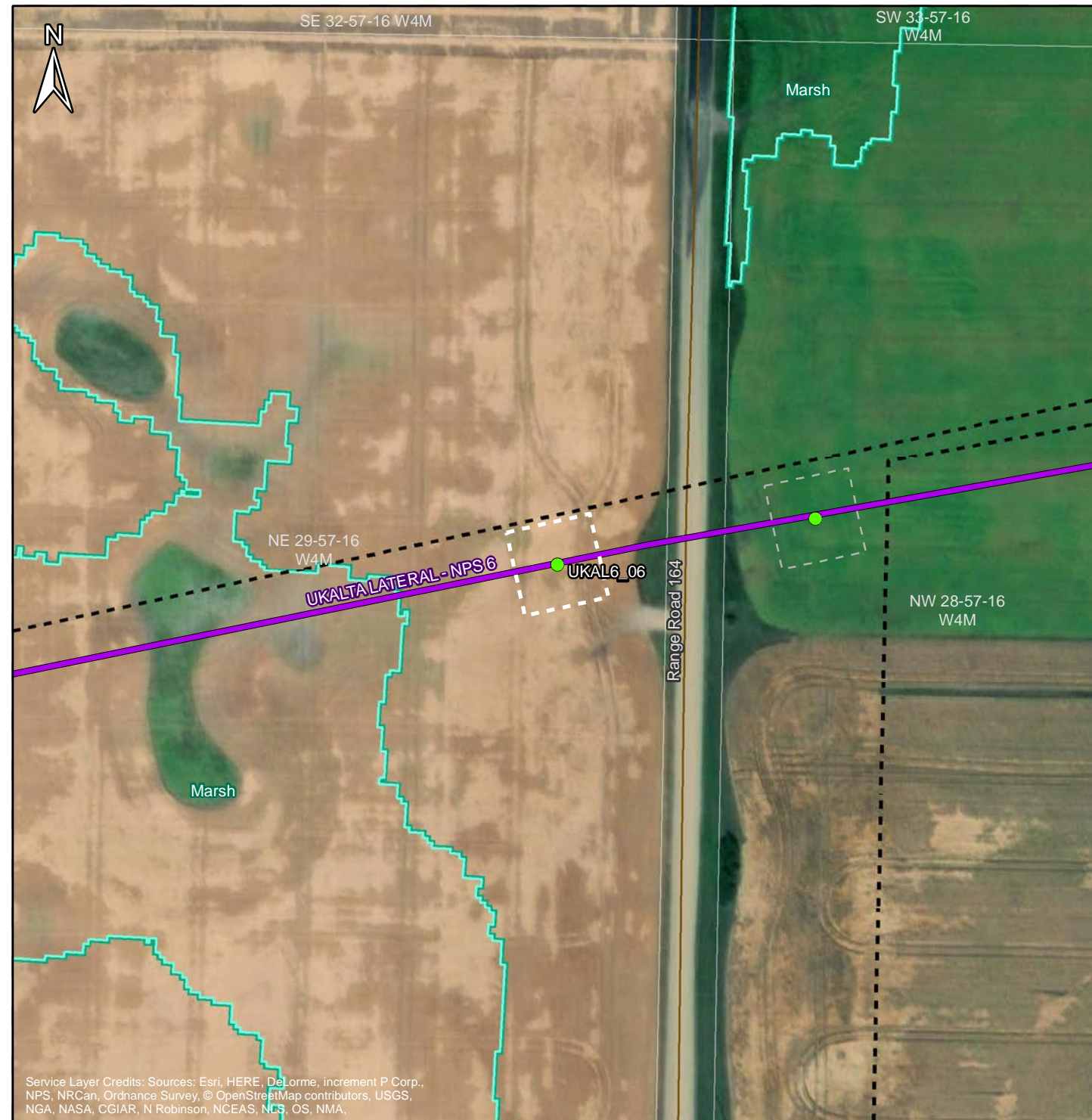
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Metres

NGTL
2022 ABANDONMENT PROGRAM
UKA06 (UKAL6_04 , UKAL6_05)
Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

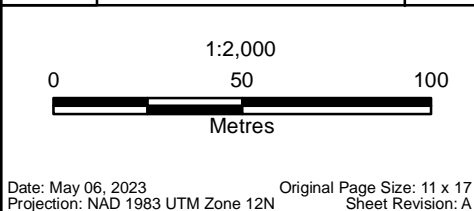


PROGRAM COMPONENT	UKAL6_06	
PROJECT DISTURBANCE AREA ID	UKA07	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NE 29-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
OTHER		

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

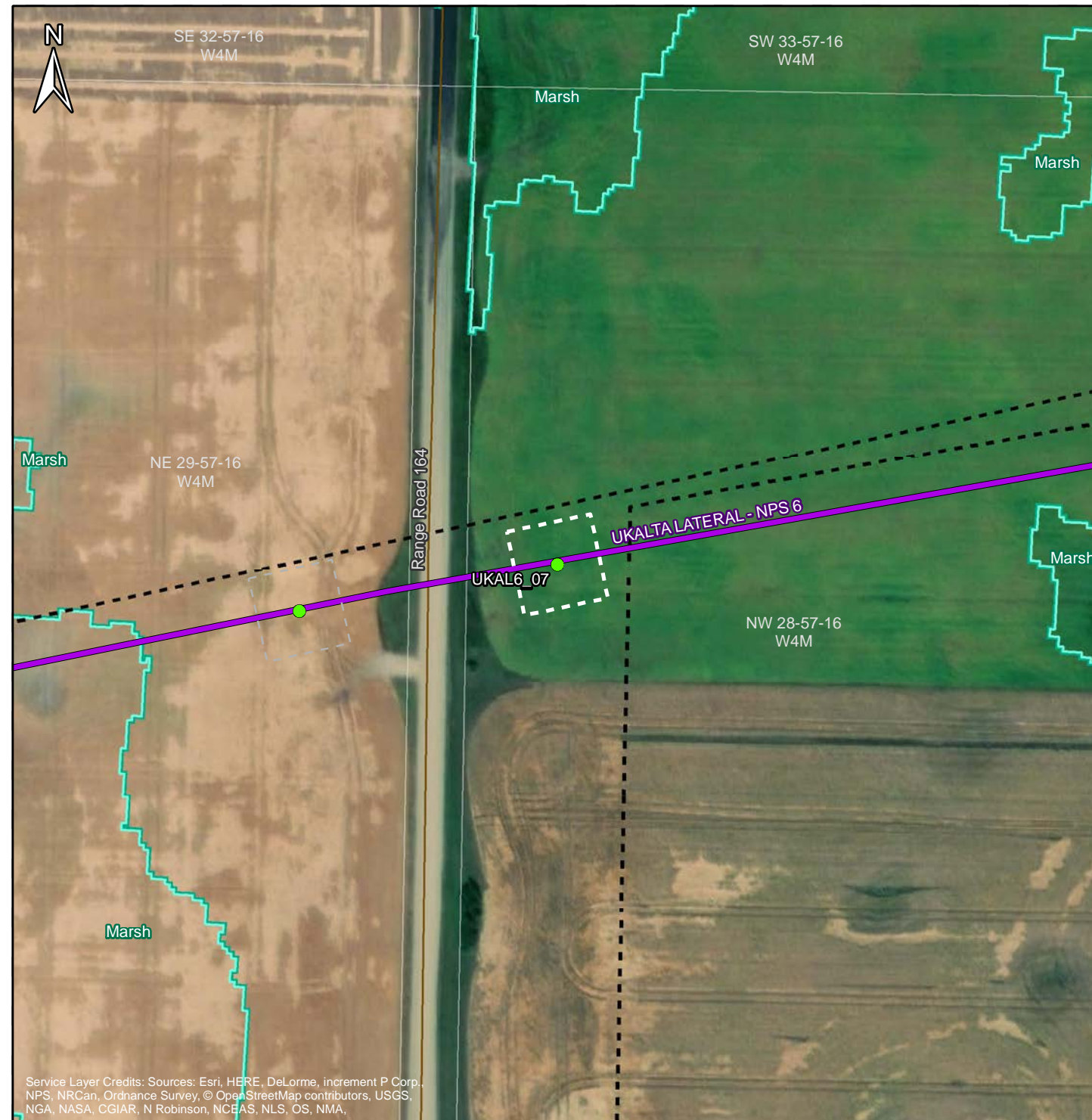


NGTL
2022 ABANDONMENT PROGRAM
UKA07 (UKAL6_06)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

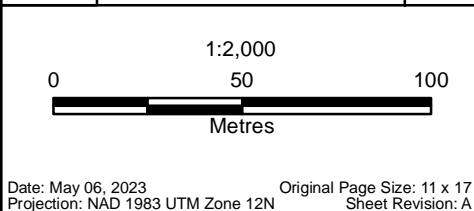


PROGRAM COMPONENT	UKAL6_07	
PROJECT DISTURBANCE AREA ID	UKA08	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 28-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

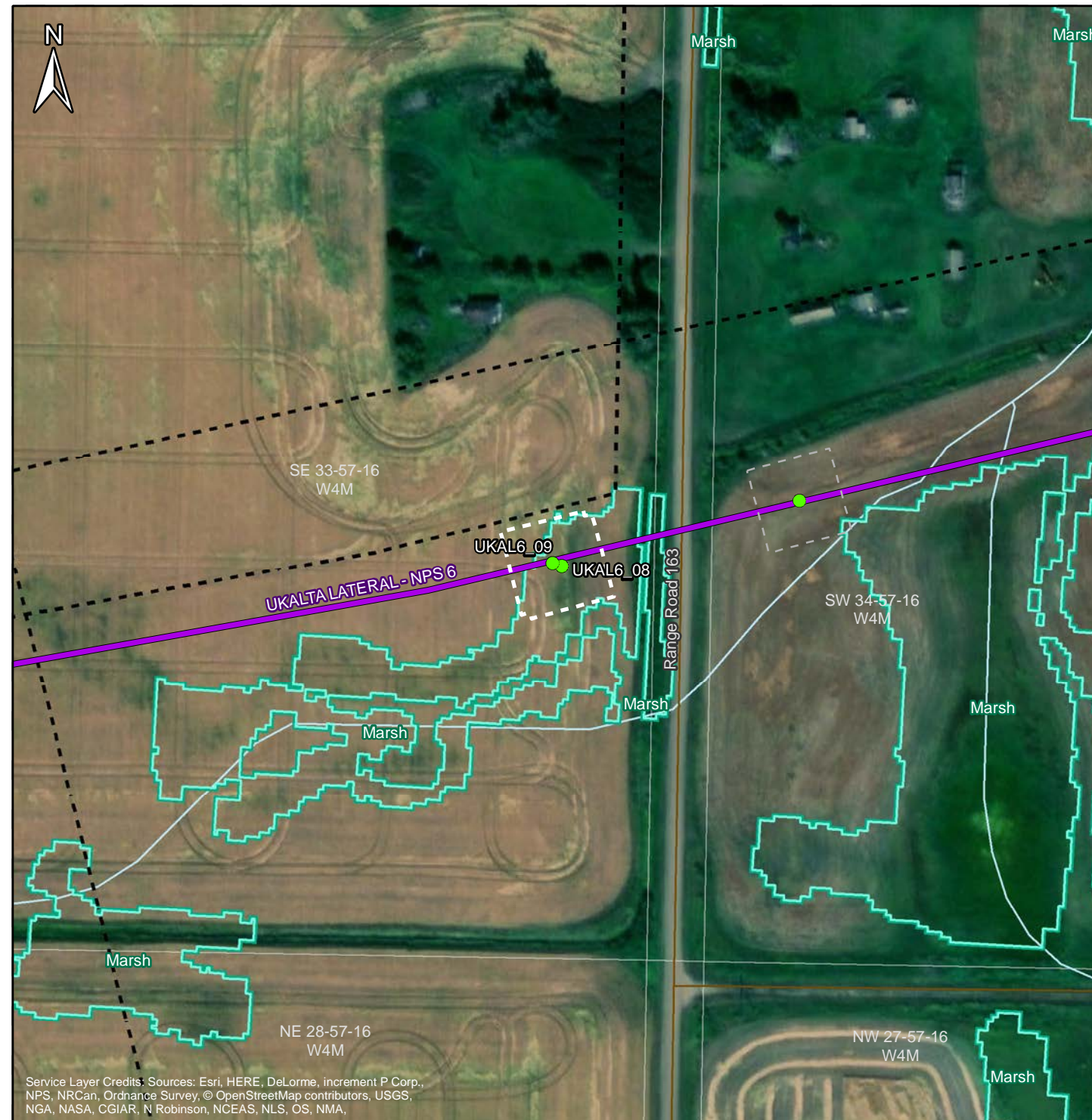


NGTL
2022 ABANDONMENT PROGRAM
UKA08 (UKAL6_07)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



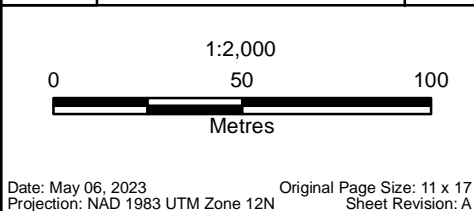
PROGRAM COMPONENT	UKAL6_08, UKAL6_09	
PROJECT DISTURBANCE AREA ID	UKA09	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 33-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Chernozemic
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- - - Existing Pipeline (AER)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

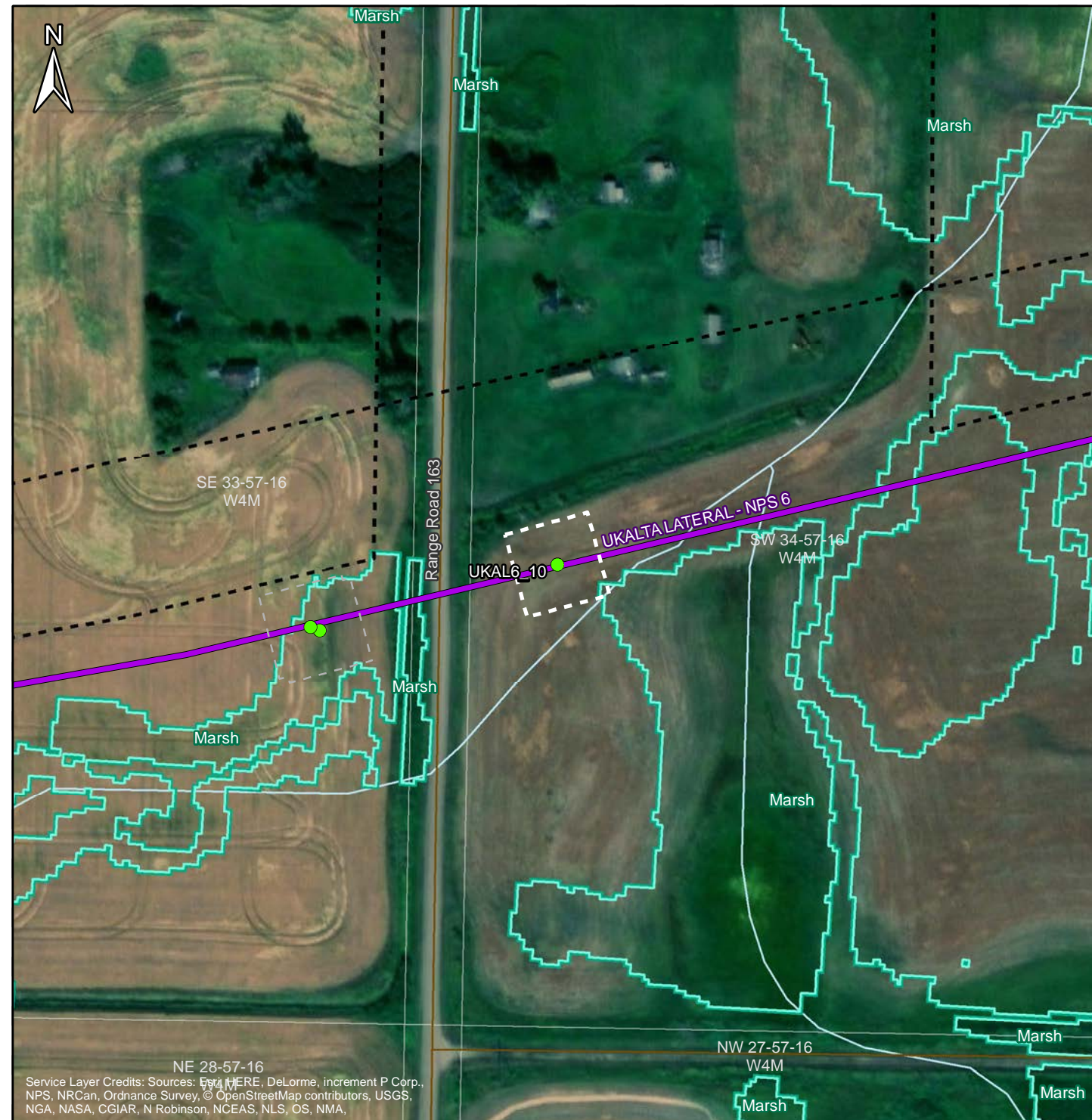


NGTL
2022 ABANDONMENT PROGRAM
UKA09 (UKAL6_08, UKAL6_09)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



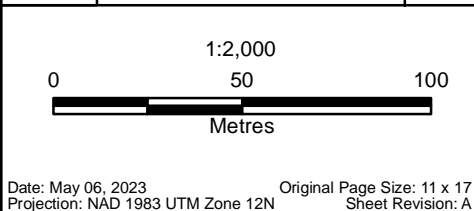
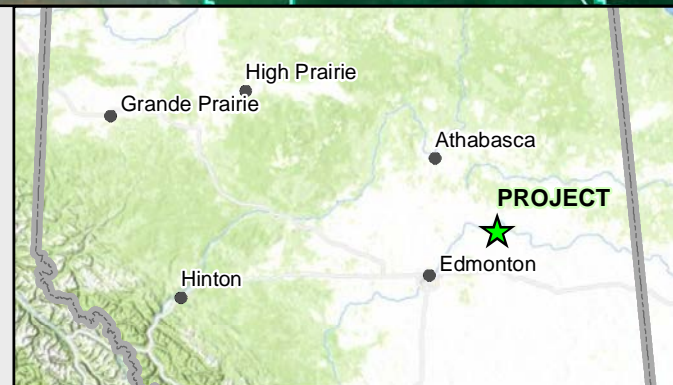
PROGRAM COMPONENT	UKAL6_10	
PROJECT DISTURBANCE AREA ID	UKA10	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 34-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> A watercourse was identified within 30 m of the PDA. No watercourses within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

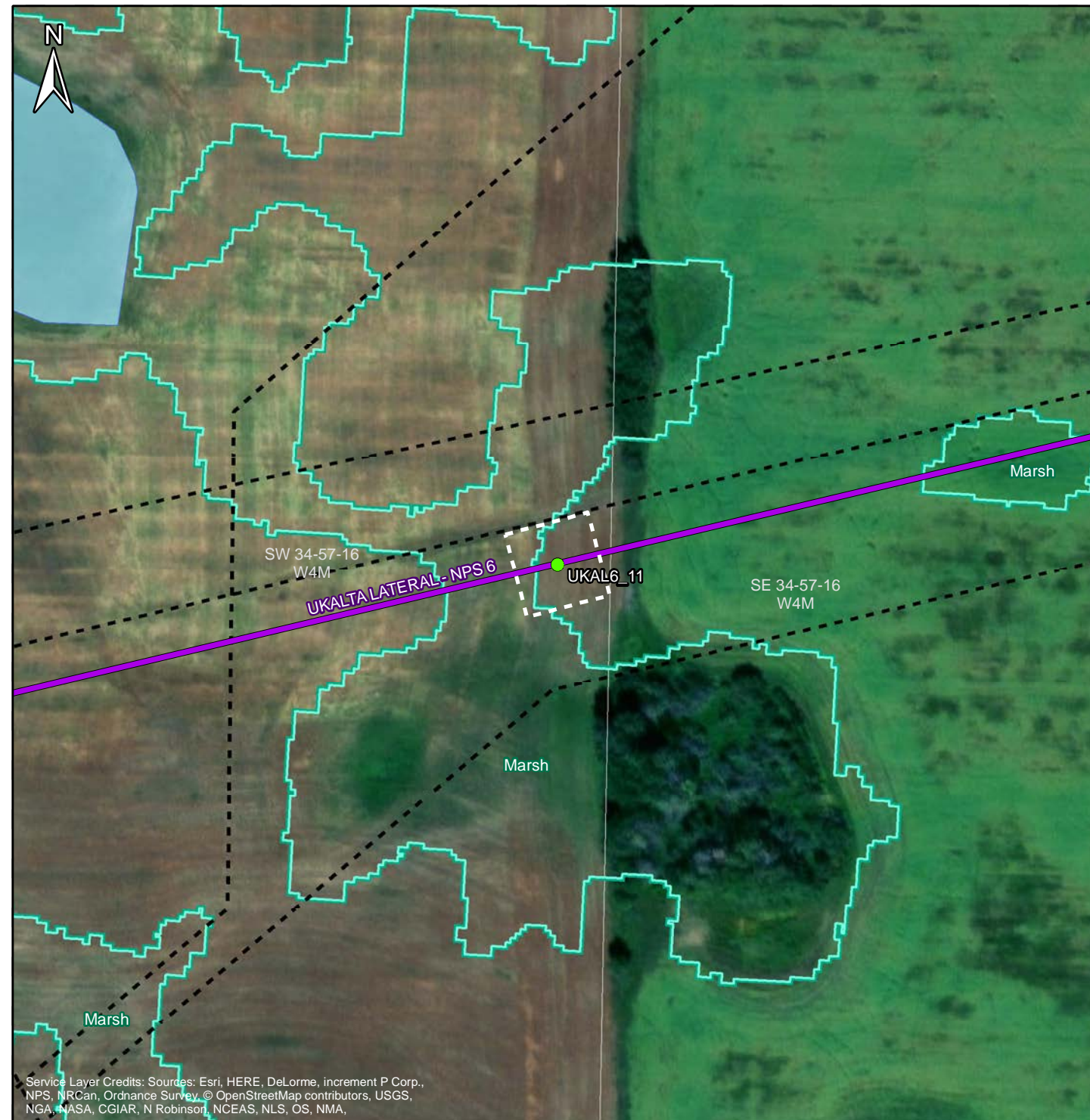


NGTL
2022 ABANDONMENT PROGRAM
UKA10 (UKAL6_10)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

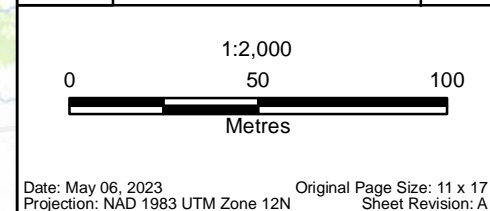
- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Existing Pipeline (AER)
- Mapped Waterbody (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, InCREMENT P Corp., NPS, NRCAN, Ordnance Survey, OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,



PROGRAM COMPONENT	UKAL6_11	
PROJECT DISTURBANCE AREA ID	UKA11	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 33-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
OTHER		

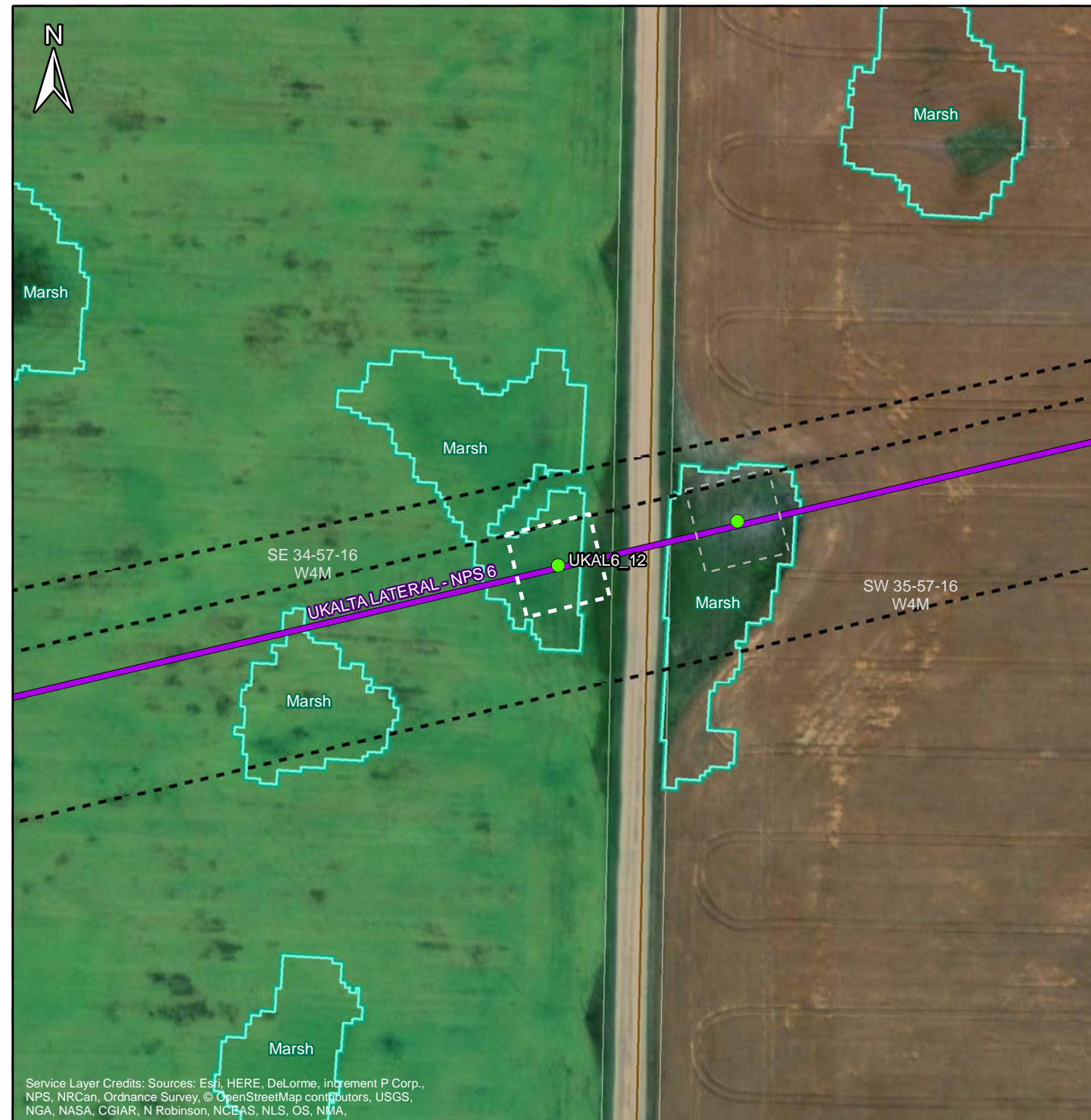


NGTL
2022 ABANDONMENT PROGRAM
UKA11 (UKAL6_11)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

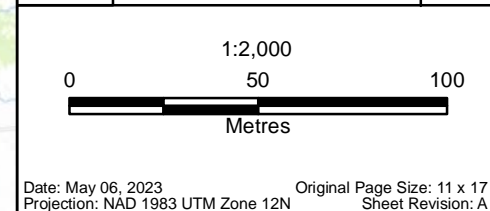
- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, InCREMENT P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCBAS, NLS, OS, NMA,



PROGRAM COMPONENT	UKAL6_12	
PROJECT DISTURBANCE AREA ID	UKA12	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 34-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

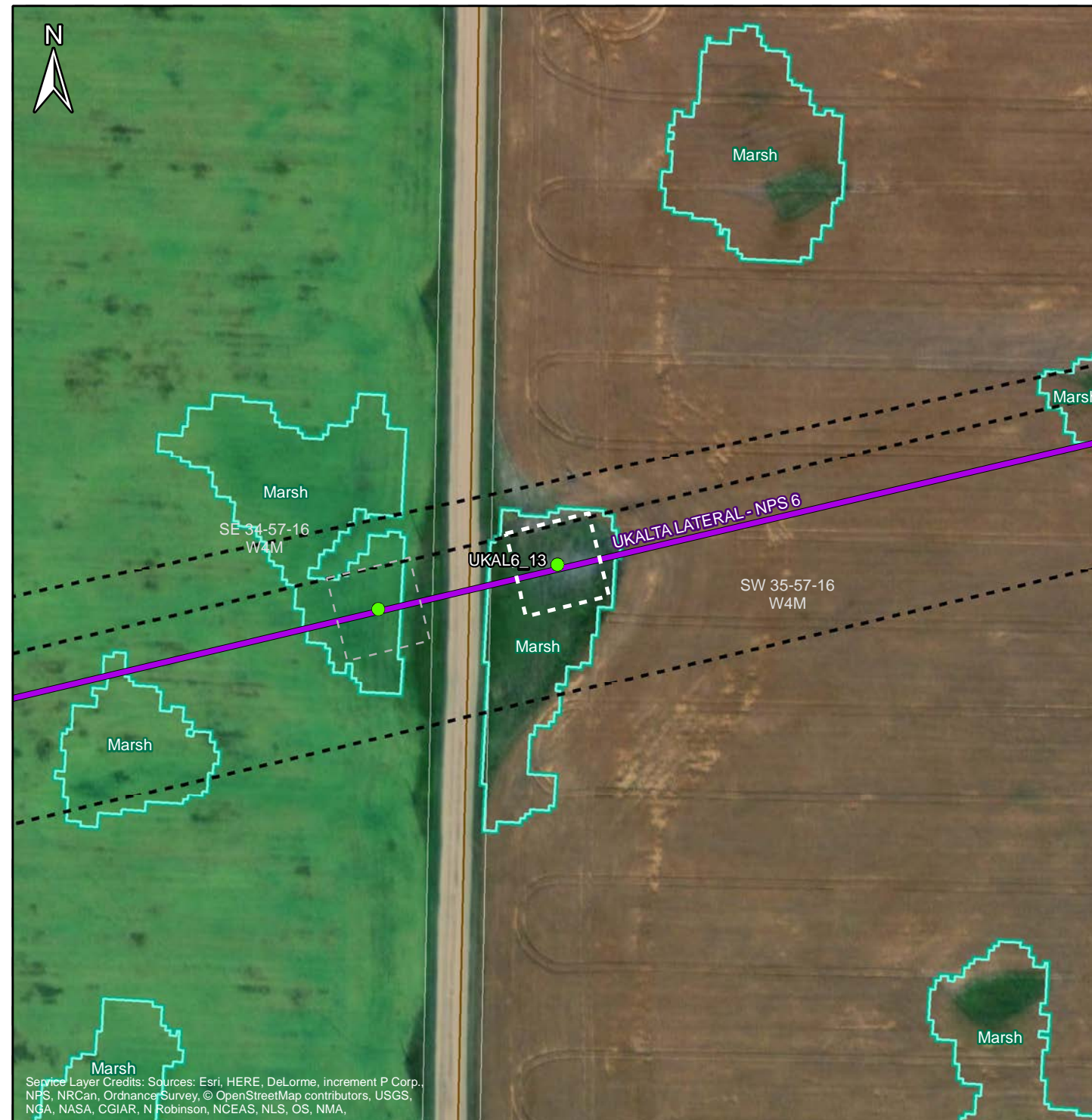


NGTL
2022 ABANDONMENT PROGRAM
UKA12 (UKAL6_12)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



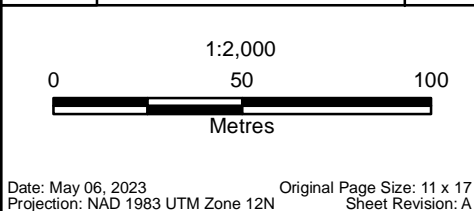
PROGRAM COMPONENT	UKAL6_13	
PROJECT DISTURBANCE AREA ID	UKA13	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 35-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

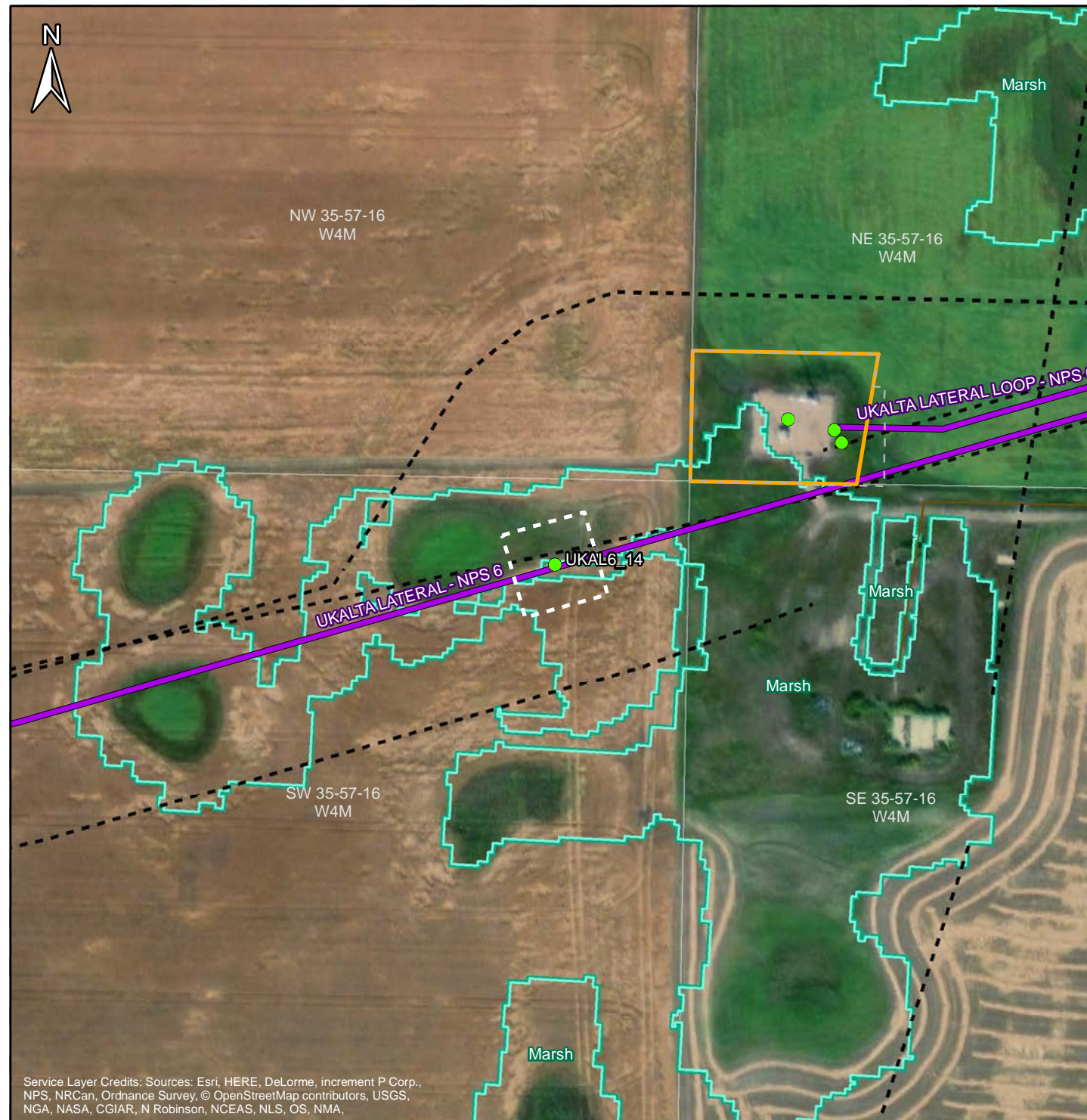
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TC ENERGY
DECOMMISSIONING & ABANDONMENT 2023
UKA13 (UKAL6_13)
Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	UKAL6_14	
PROJECT DISTURBANCE AREA ID	UKA14	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 35-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

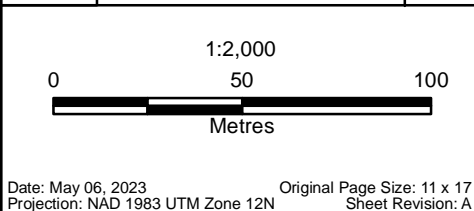
LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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NGTL
2022 ABANDONMENT PROGRAM
UKA14 (UKAL6_14)

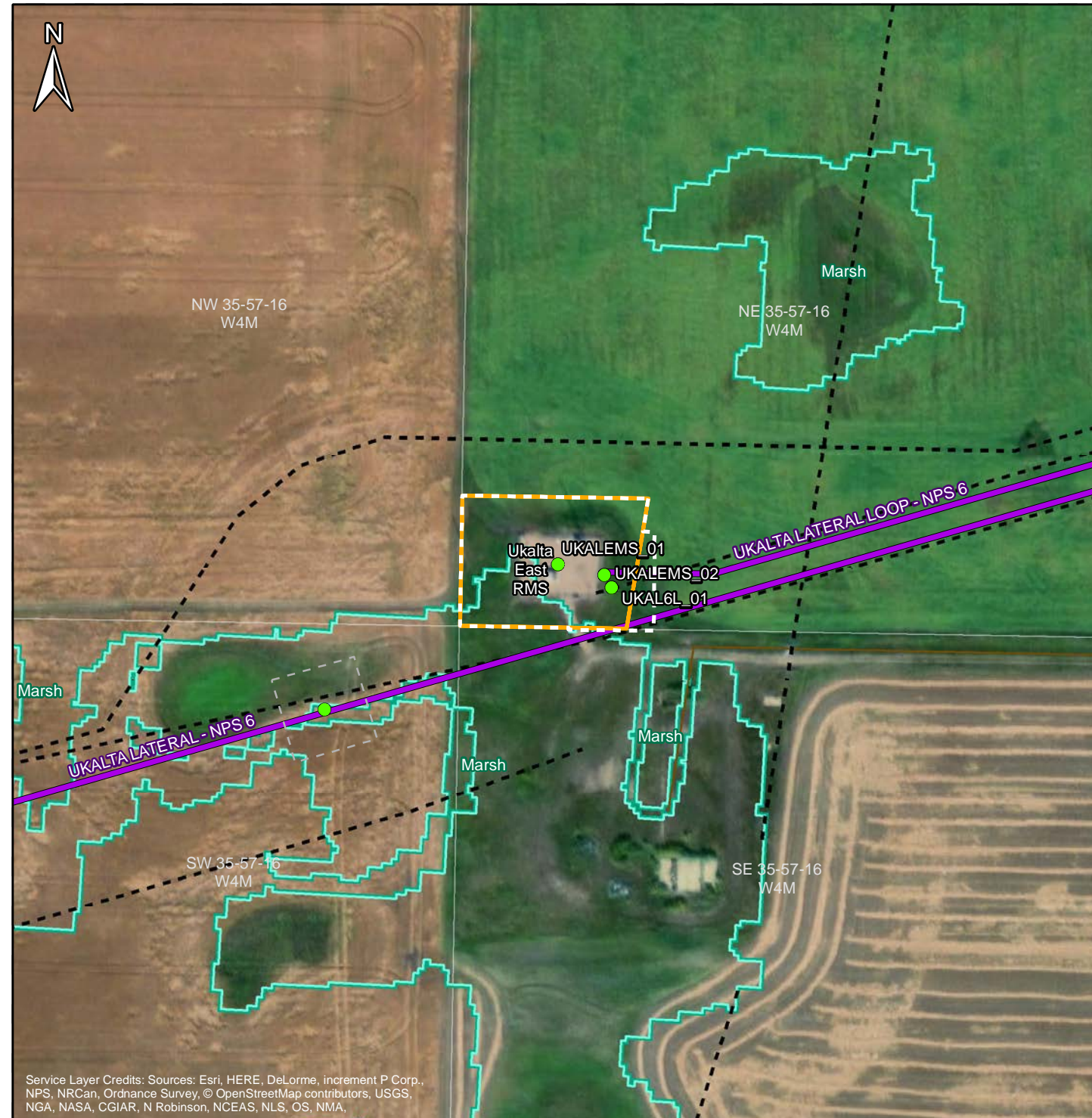
Lamont County, AB

PROJECT NO. TBD

Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

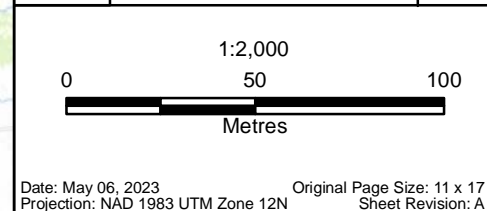
- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



PROGRAM COMPONENT	Ukalta East RMS, UKALEMS_01, UKAL6L_01, UKALEMS_02	
PROJECT DISTURBANCE AREA ID	UKA15	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	NE 35-57-16 W4M, SE 35-57-16 W4M, NE 35-057-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. See notes on Page 1.
	ACCESS	Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

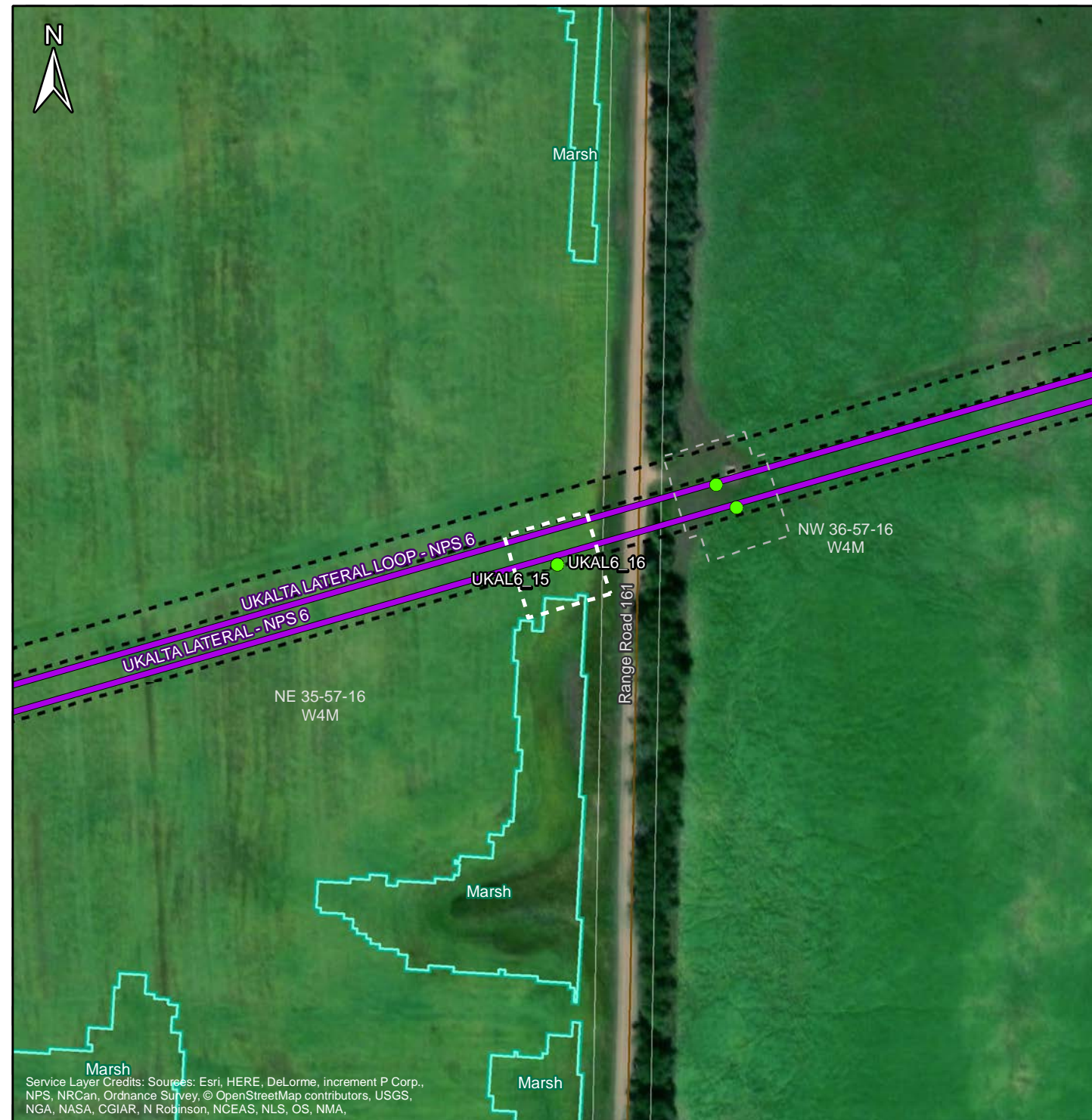


NGTL
2022 ABANDONMENT PROGRAM
UKA15 (Ukalta East RMS, UKALEMS_01, UKAL6L_01, UKALEMS_02)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

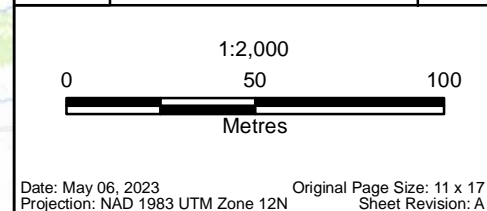
- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,



PROGRAM COMPONENT	UKAL6_15, UKAL6_16	
PROJECT DISTURBANCE AREA ID	UKA17	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NE 35-57-16 W4M, NW 36-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

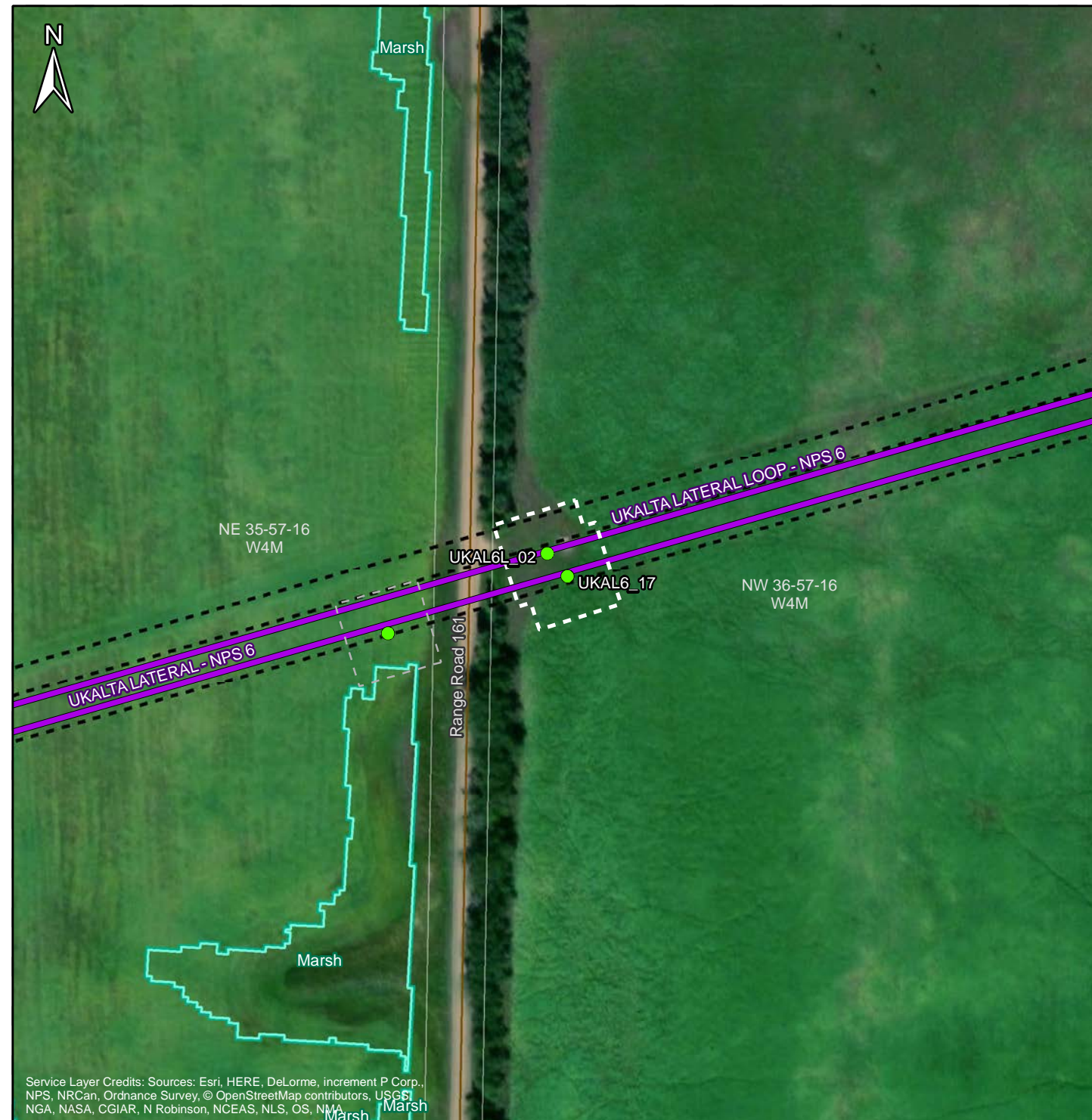


NGTL
2022 ABANDONMENT PROGRAM
UKA17 (UKAL6_15, UKAL6_16)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, increment P Corp., NPS, NRCan, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA



PROGRAM COMPONENT	UKAL6_17, UKAL6L_02	
PROJECT DISTURBANCE AREA ID	UKA18	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 36-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

1:2,000

Metres

NGTL
2022 ABANDONMENT PROGRAM
UKA18 (UKAL6_17, UKAL6L_02)

Lamont County, AB

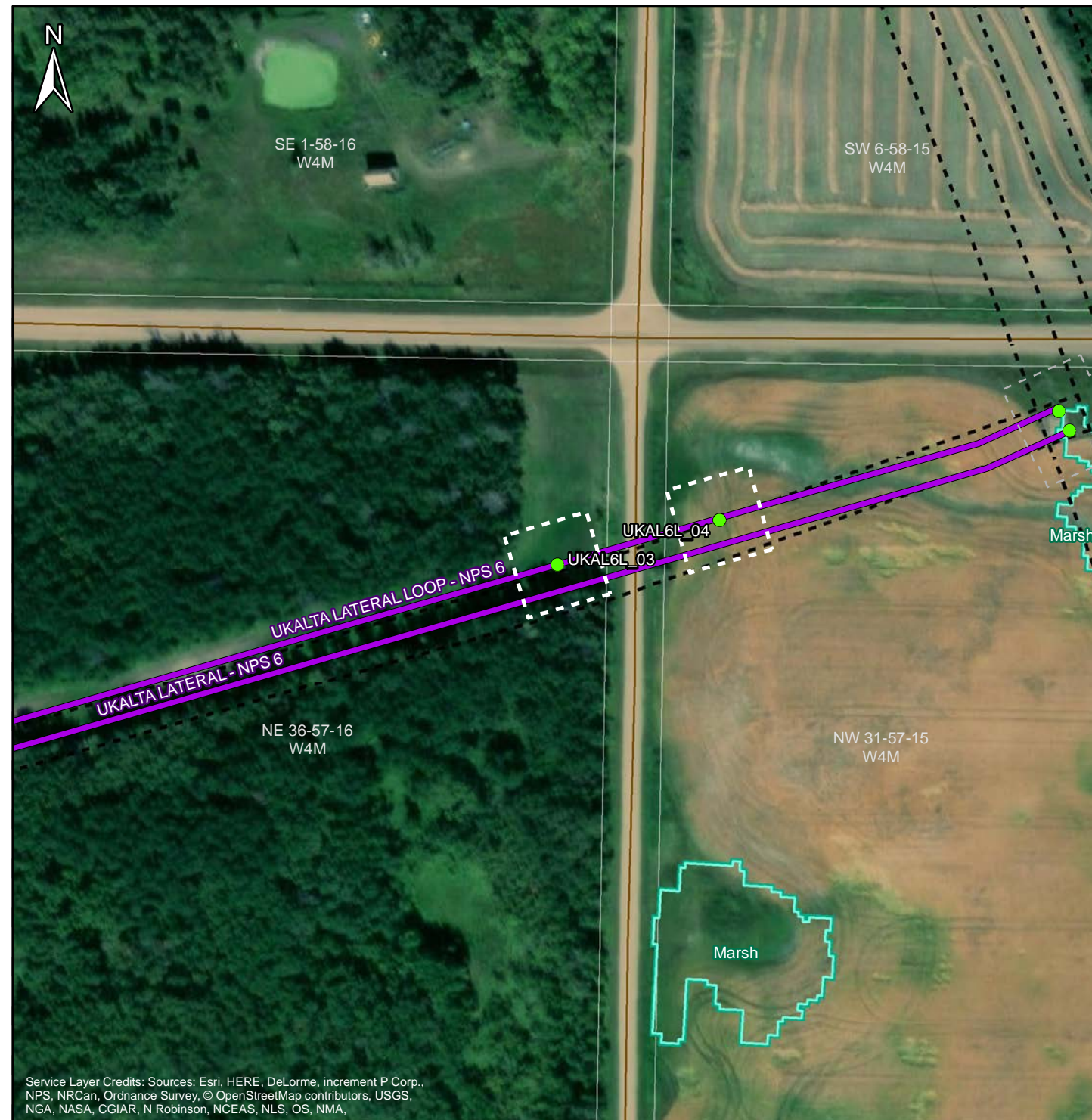
PROJECT NO. TBD

Environmental Site Information Sheet

Date: May 06, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	UKAL6L_03, UKAL6L_04	
PROJECT DISTURBANCE AREA ID	UKA19	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 31-57-15 W4M, NE 36-57-16 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Forest/Shrub	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. No wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

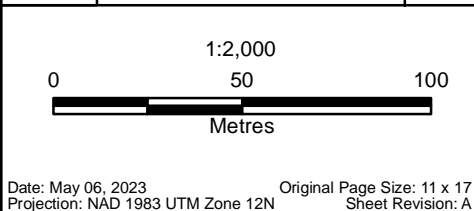
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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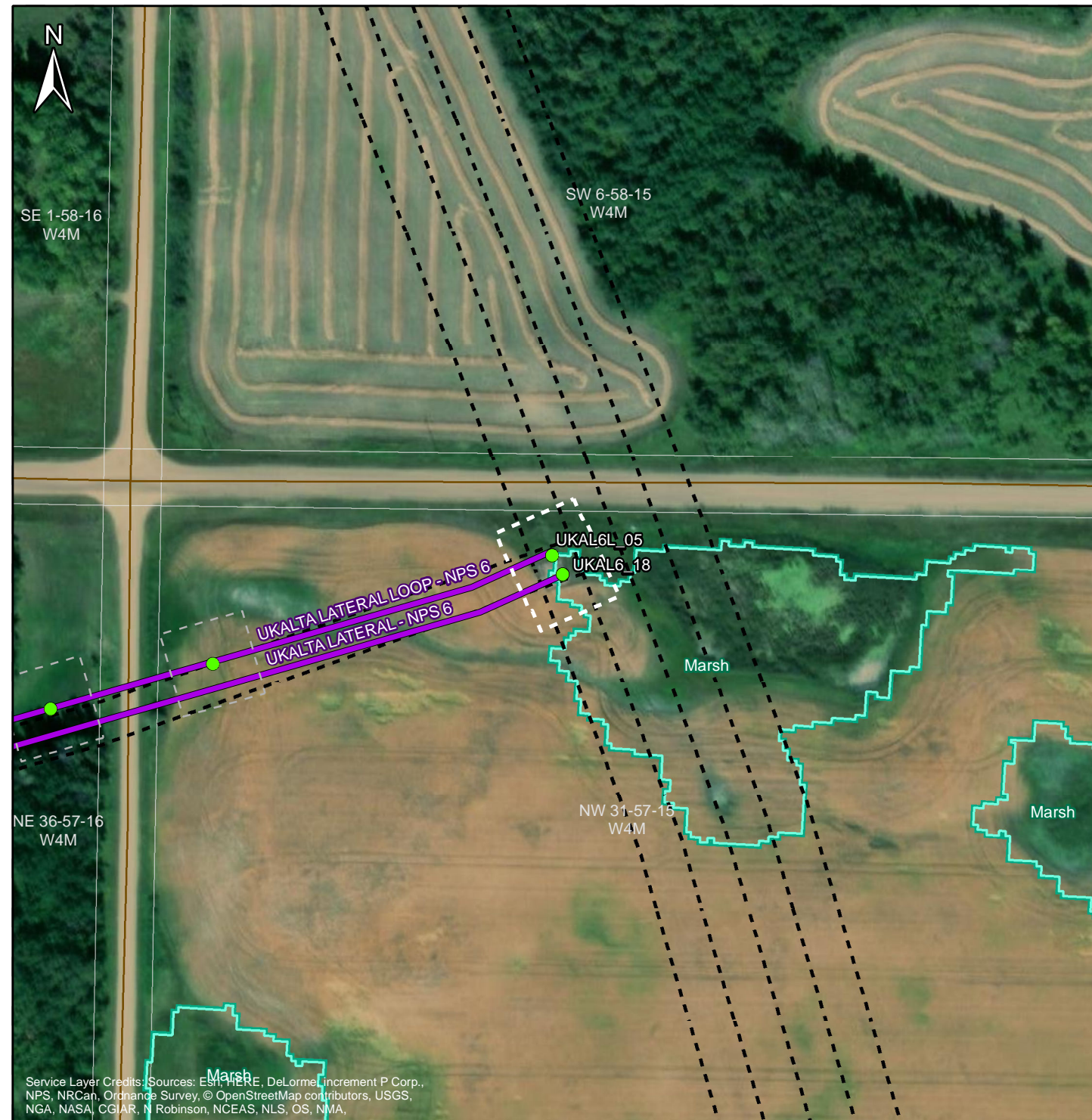


NGTL
2022 ABANDONMENT PROGRAM
UKA19 (UKAL6L_03, UKAL6L_04)

Lamont County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	UKAL6_18, UKAL6L_05	
PROJECT DISTURBANCE AREA ID	UKA20	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 31-57-15 W4M, SW 6-58-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> Wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. See notes on Page 1 regarding activities near wetlands. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

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0 50 100

Metres

NGTL

2022 Abandonment Program

UKA20 (UKAL6_18, UKAL6L_05)

Lamont County, AB

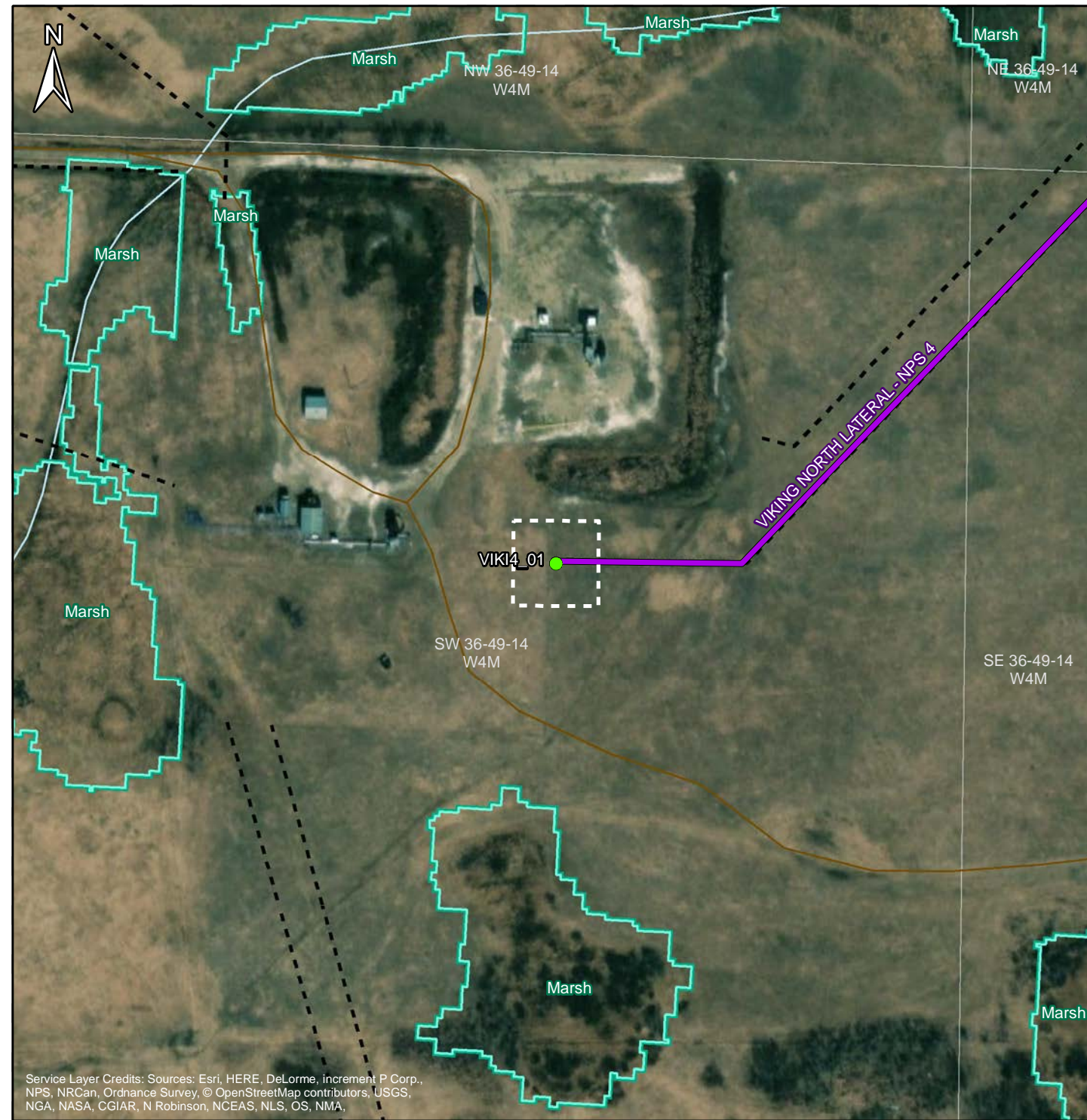
PROJECT NO. TBD

Environmental Site Information Sheet

Date: May 18, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	VIKI4_01	
PROJECT DISTURBANCE AREA ID	VIK01	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 36-49-14 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

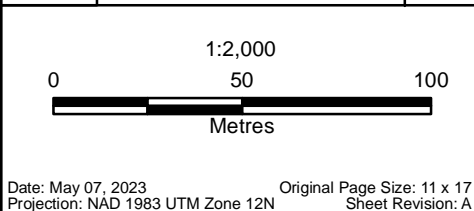
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- - - PDA
- Road
- - - Existing Pipeline (AER)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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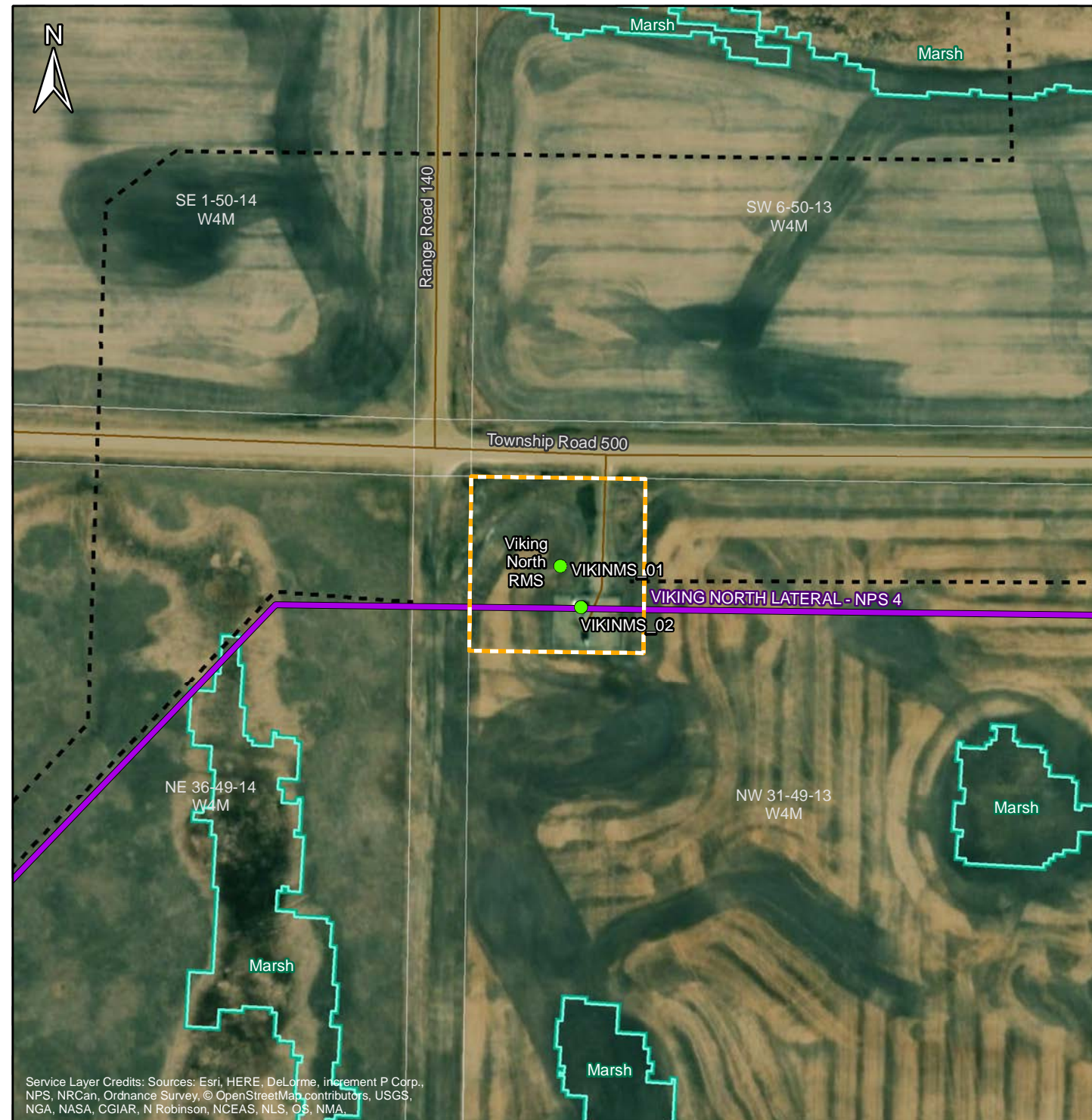


NGTL
2022 ABANDONMENT PROGRAM
VIK01 (VIKI4_01)

Beaver County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

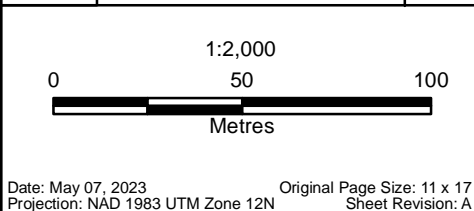
- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

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PROGRAM COMPONENT	Viking North RMS, VIKINMS_01 , VIKINMS_02	
PROJECT DISTURBANCE AREA ID	VIK04	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL linesolation at NGTL line	
LEGAL LAND LOCATION	NW 31-049-13 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

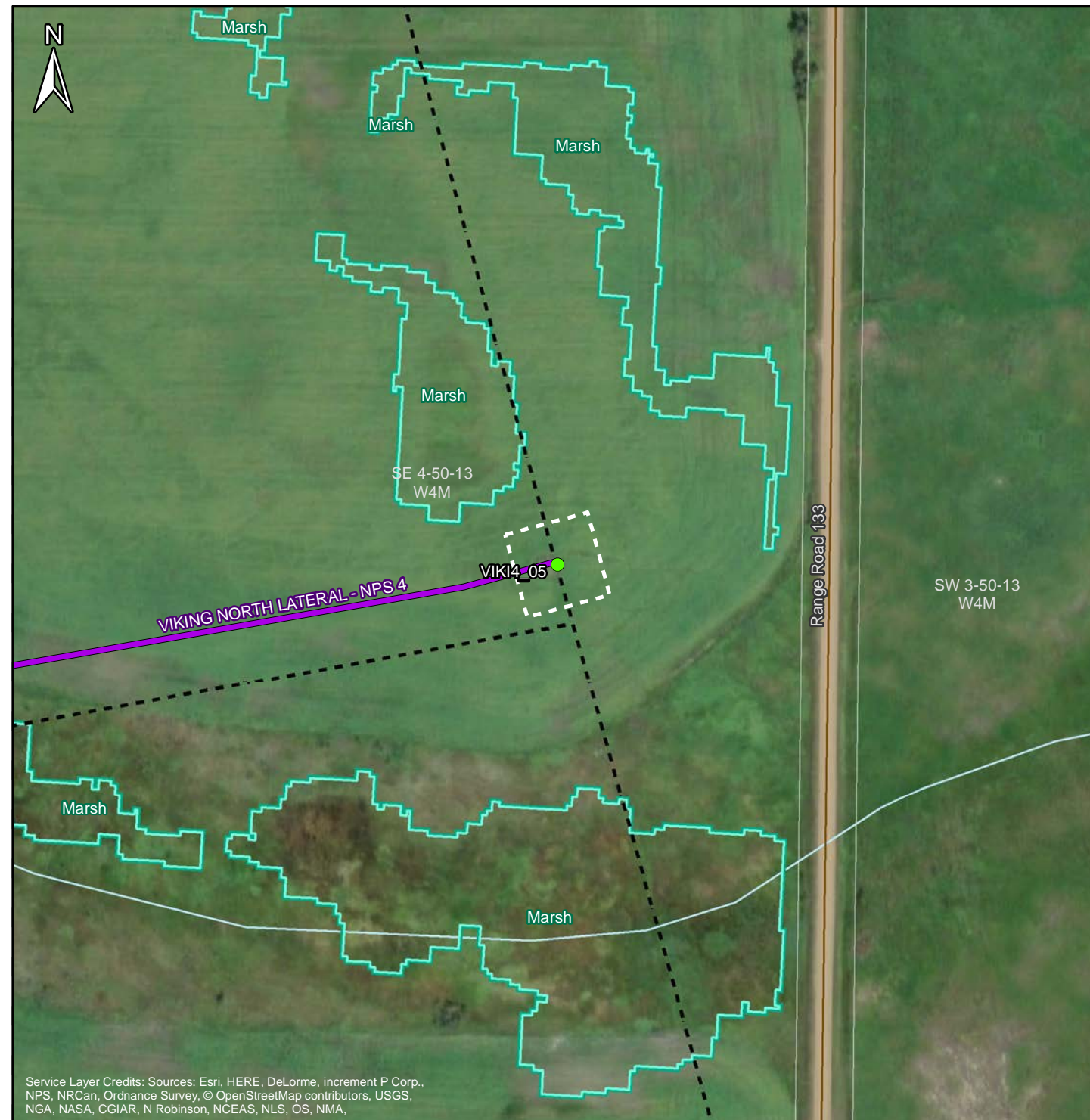


NGTL
2022 ABANDONMENT PROGRAM
VIK04 (Viking North RMS, VIKINMS_01 , VIKINMS_02)

Beaver County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	VIK14_05	
PROJECT DISTURBANCE AREA ID	VIK07	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 4-50-13 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed, Grassland	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. A watercourse was identified within 100 m of the PDA. See notes on Page 1 regarding activities near watercourses. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

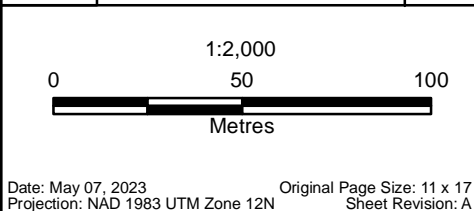
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- - - Existing Pipeline (AER)
- Mapped Watercourse (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incentiv P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

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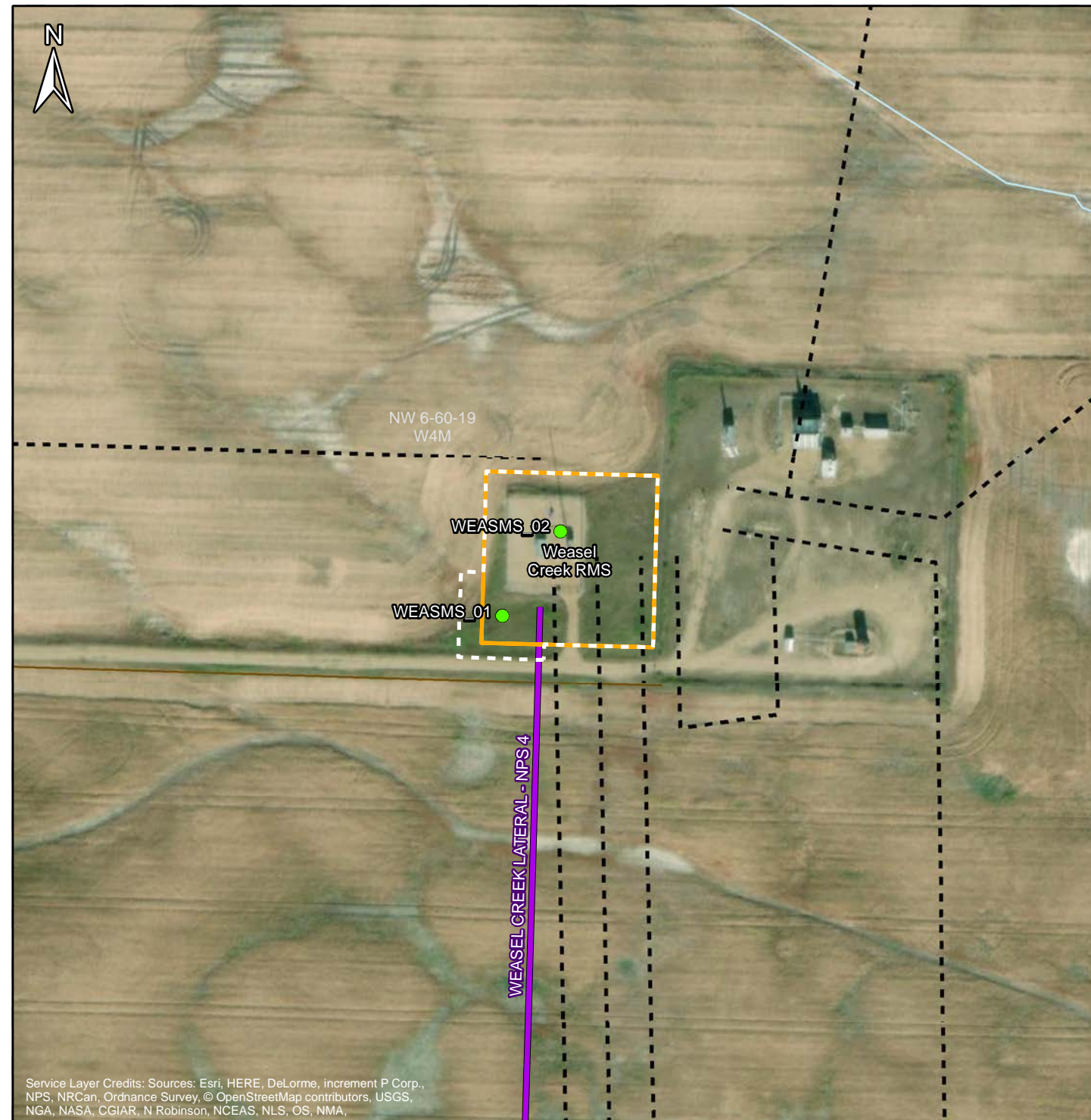


TC ENERGY
DECOMMISSIONING & ABANDONMENT 2023
VIK07 (VIK14_05)

Beaver County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



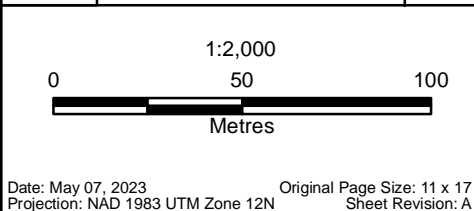
PROGRAM COMPONENT	Weasel Creek RMS, WEASMS_02, WEASMS_01	
PROJECT DISTURBANCE AREA ID	WEA01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	NW 06-060-19 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Watercourse (Altalis)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,



NGTL
2022 ABANDONMENT PROGRAM
WEA01 (Weasel Creek RMS, WEASMS_02, WEASMS_01)

Smoky Lake County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 07, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	WEAS4_02RD, WEAS4_03RD	
PROJECT DISTURBANCE AREA ID	WEA03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 6-60-19 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	Luvisolic • Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	• Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. • Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	• No watercourses within 30 m of the PDA. • No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	• No fish-bearing watercourses within 30m of the PDA. • No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	• No rare plants or rare ecological communities have been identified within the PDA. • No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	• No wetlands have been identified within or intersecting the PDA. • No wetlands have been identified within 100m of the PDA.
	WILDLIFE	SRT OWL • Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	• There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	• There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	• In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). • See notes on Page 1.
	ACCESS	• Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	• See notes on Page 1 regarding reclamation. • Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. • Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

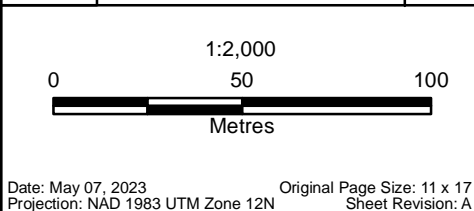
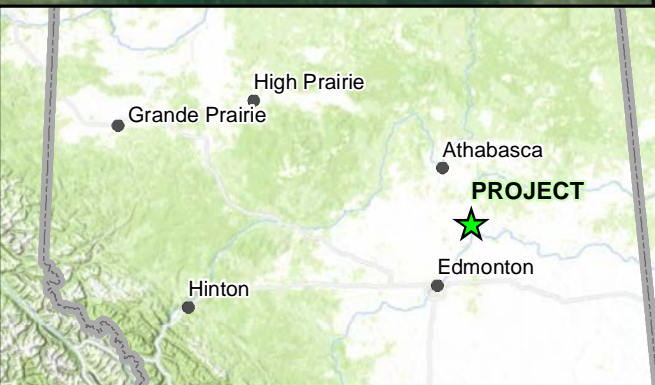
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA,

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

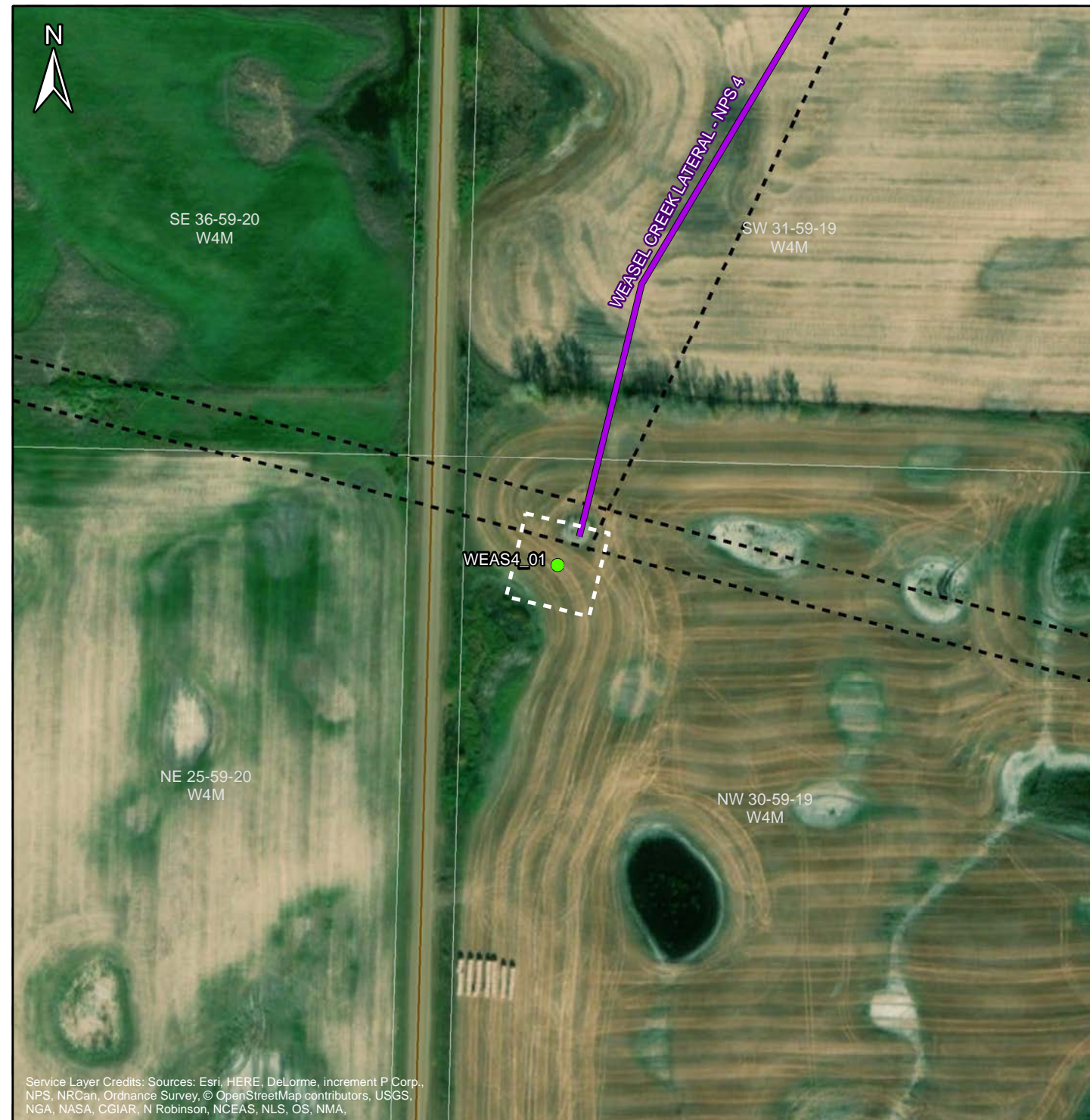


NGTL
2022 ABANDONMENT PROGRAM
WEA03 (WEAS4_02RD, WEAS4_03RD)

Smoky Lake County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

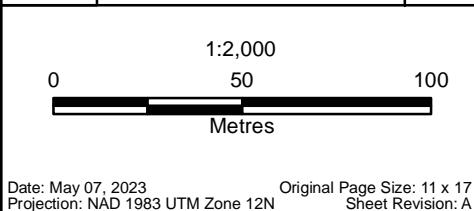


PROGRAM COMPONENT	WEAS4_01	
PROJECT DISTURBANCE AREA ID	WEA04	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	NW 30-59-19 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- - - Existing Pipeline (AER)

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.



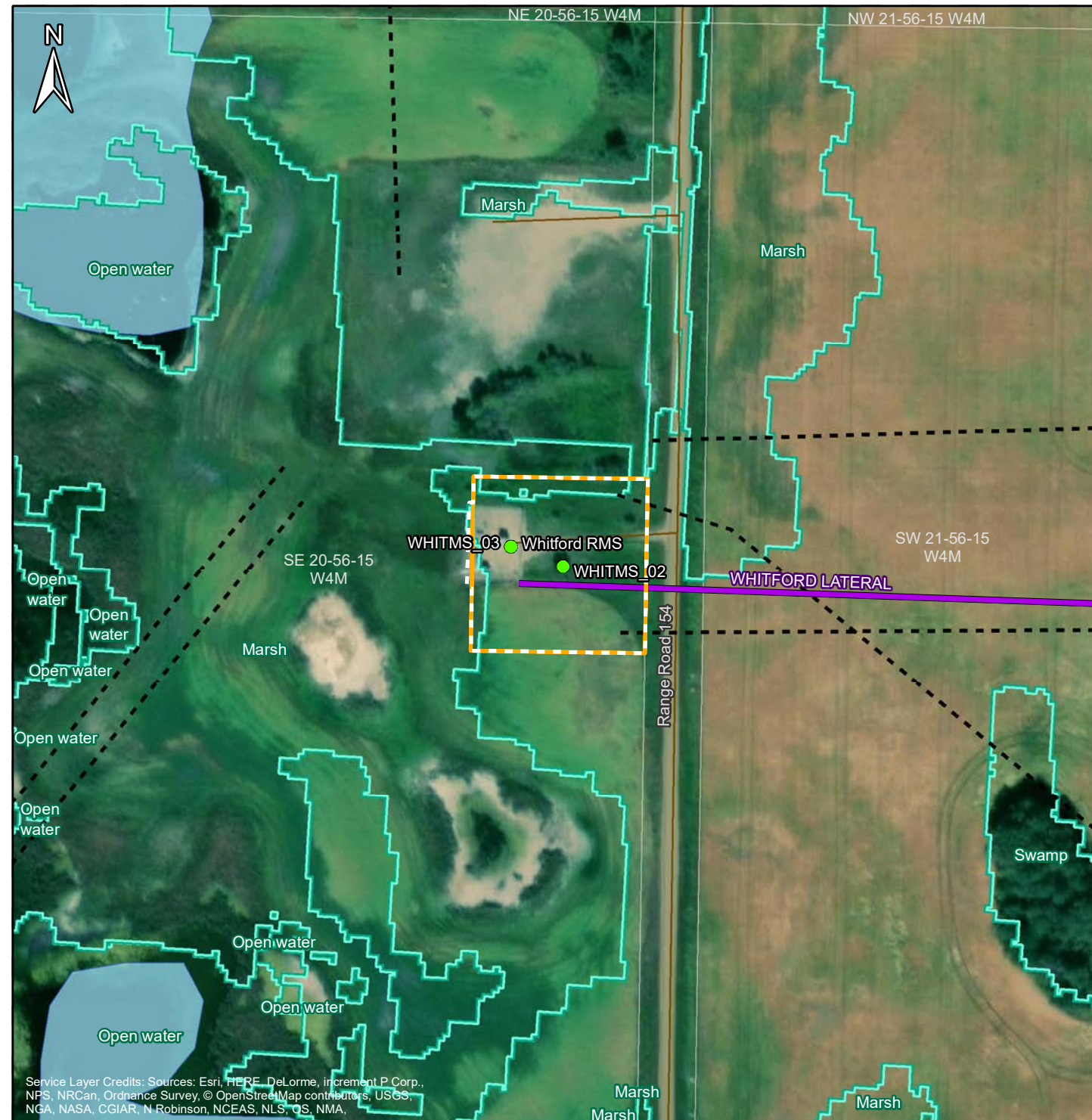
**NGTL
2022 ABANDONMENT PROGRAM
WEA04 (WEAS4_01)**

Smoky Lake County, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

Date: May 07, 2023 Original Page Size: 11 x 17
Projection: NAD 1983 UTM Zone 12N Sheet Revision: A

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

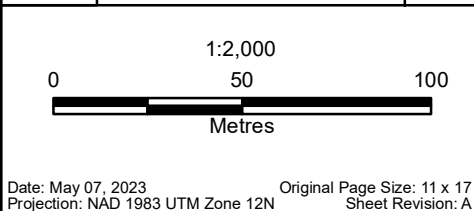


PROGRAM COMPONENT	Whitford RMS, WHITMS_02, WHITMS_03	
PROJECT DISTURBANCE AREA ID	WHI01	
PLANNED ACTIVITIES	Removal of meter station, including buildings, yard piping, fencing, gravel and driveway Isolation at NGTL line	
LEGAL LAND LOCATION	SE 20-056-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	• Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Brunisols, Gleysols, Luvisols and/or Organic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	• Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. • Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	• No watercourses within 30 m of the PDA. • No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	• No fish-bearing watercourses within 30m of the PDA. • No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	• No rare plants or rare ecological communities have been identified within the PDA. • No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	• Wetlands have been identified within or intersecting the PDA. • Wetlands have been identified within 100m of the PDA. • A notification under the Water Act COP will be submitted at least 14 days prior to planned physical abandonment activities (temporary disturbance) in a marsh wetland or open water. • See notes on Page 1 regarding activities near wetlands. • Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. • Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	SRT OWL • Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	• There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	• There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	• Existing and/or potential contamination associated with project facilities will be investigated and addressed (where required) in accordance with the Phase II Environmental Site Assessment Plan, submitted for CER approval as part of the Application. • In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). • See notes on Page 1.
	ACCESS	• Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	• Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. • See notes on Page 1 regarding reclamation. • Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. • Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Meter Station
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Mapped Waterbody (Altalis)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential species at Risk wildlife constraints that may interact within the PDA.

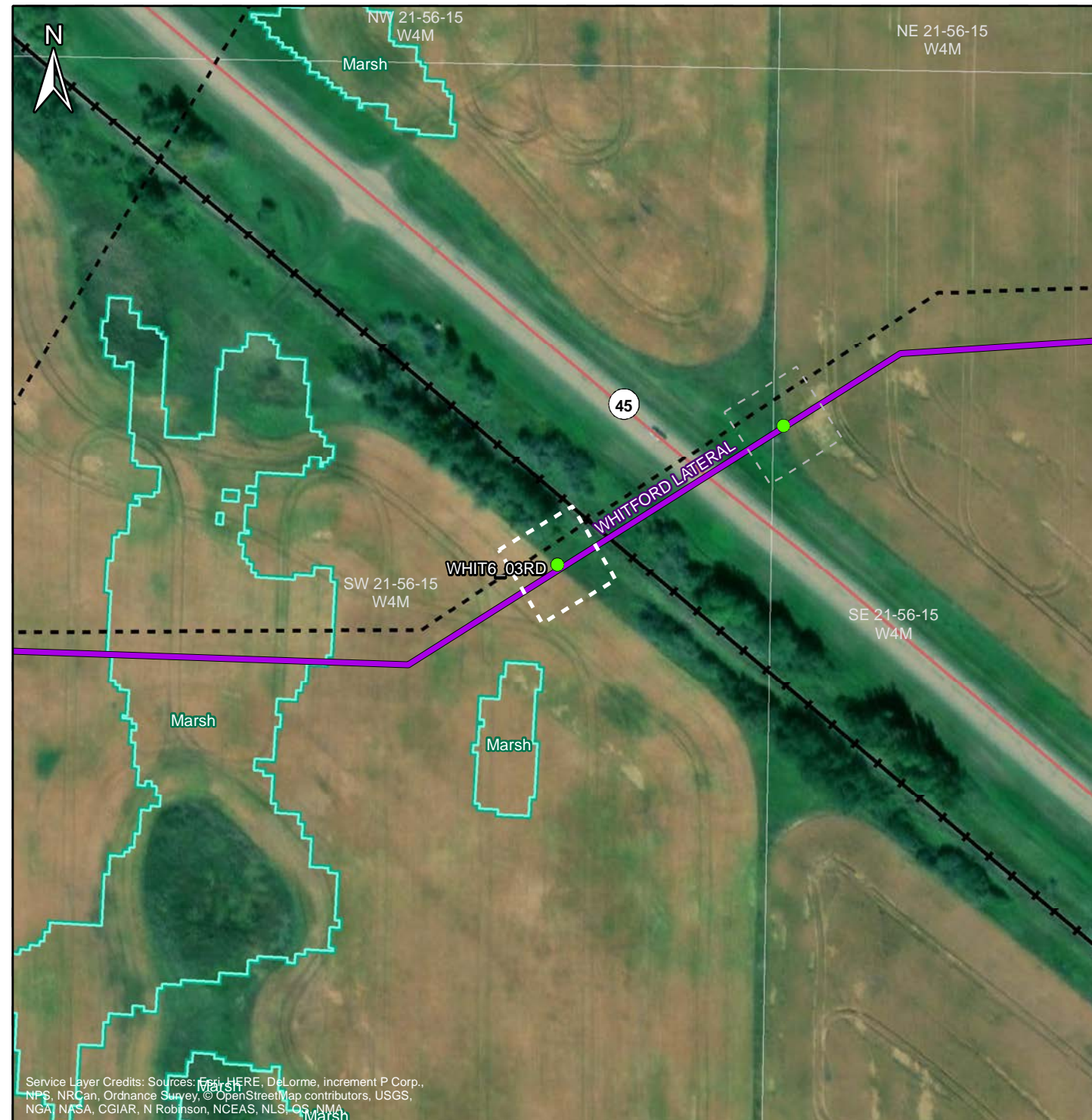


NGTL
2022 ABANDONMENT PROGRAM
WHI01 (Whitford RMS, WHITMS_02, WHITMS_03)

County of Two Hills No. 21, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



PROGRAM COMPONENT	WHIT6_03RD	
PROJECT DISTURBANCE AREA ID	WHI03	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 21-56-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. Wetlands have been identified within 100m of the PDA. Follow general wetland mitigation measures as outlined in Section 8.1 of the EPP. See notes on Page 1 regarding activities near wetlands. Conduct refuelling at least 100 m away from any watercourse or waterbody, when feasible.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> Natural recovery is the preferred method of reclamation in wetlands. Do not seed wetland areas unless otherwise specified by the Company. See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

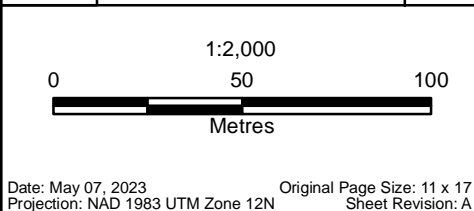
LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Highway
- Road
- Railway
- - - Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA

Service Layer Credits: Sources: Esri, HERE, DeLorme, Incent P Corp., NPS, NRCAN, Ordnance Survey, OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA

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Abandonment Infrastructure data provided by TC Energy dated 2023/04/24

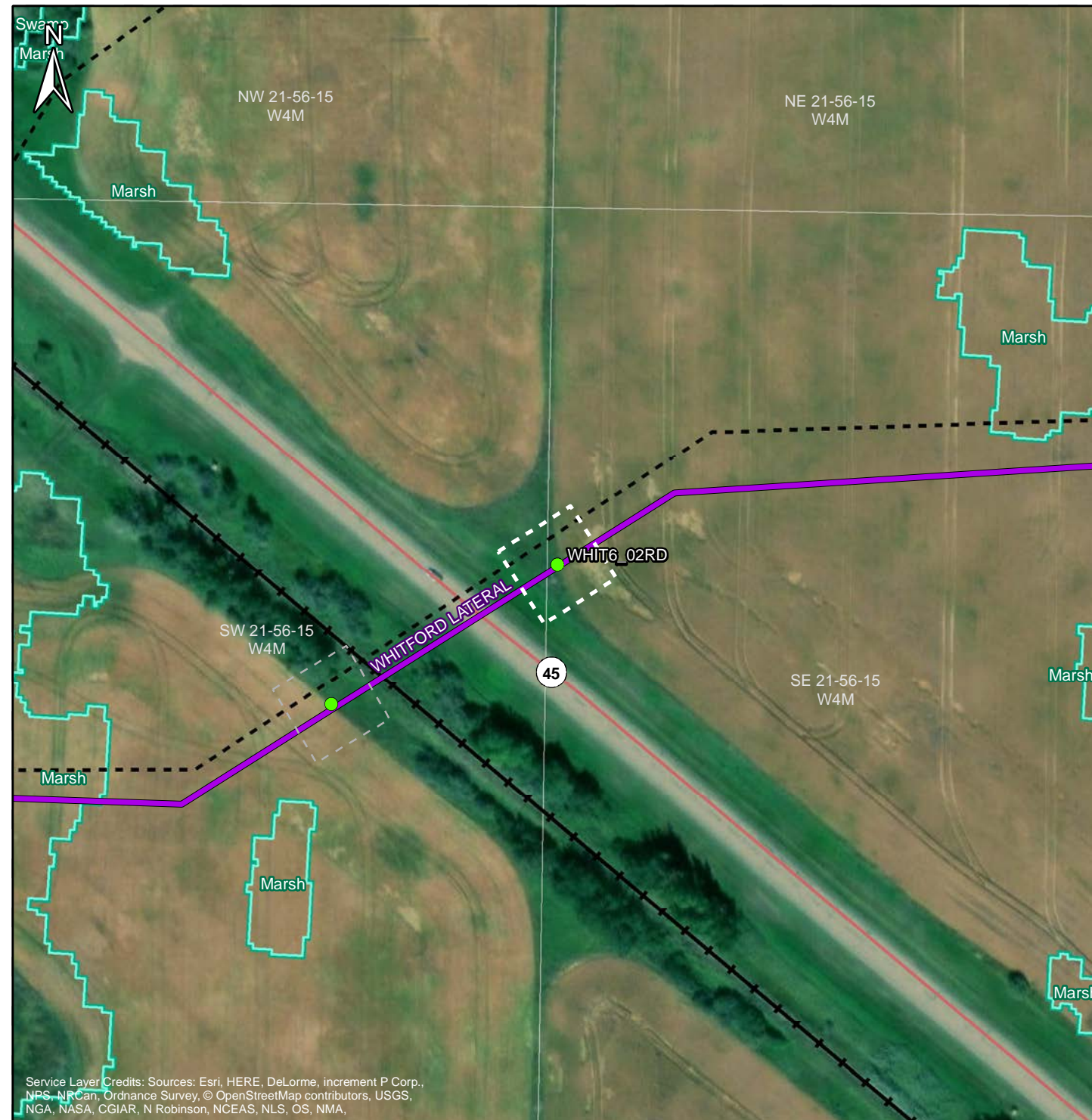


**NGTL
2022 ABANDONMENT PROGRAM
WHI03 (WHIT6_03RD)**

County of Two Hills No. 21, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.

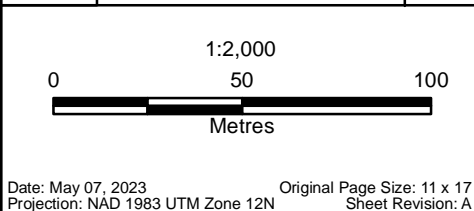


PROGRAM COMPONENT	WHIT6_02RD	
PROJECT DISTURBANCE AREA ID	WHI05	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SE 21-56-15 W4M, SW 21-56-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonetzic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	

LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Other Component PDA
- Highway
- Road
- Railway
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

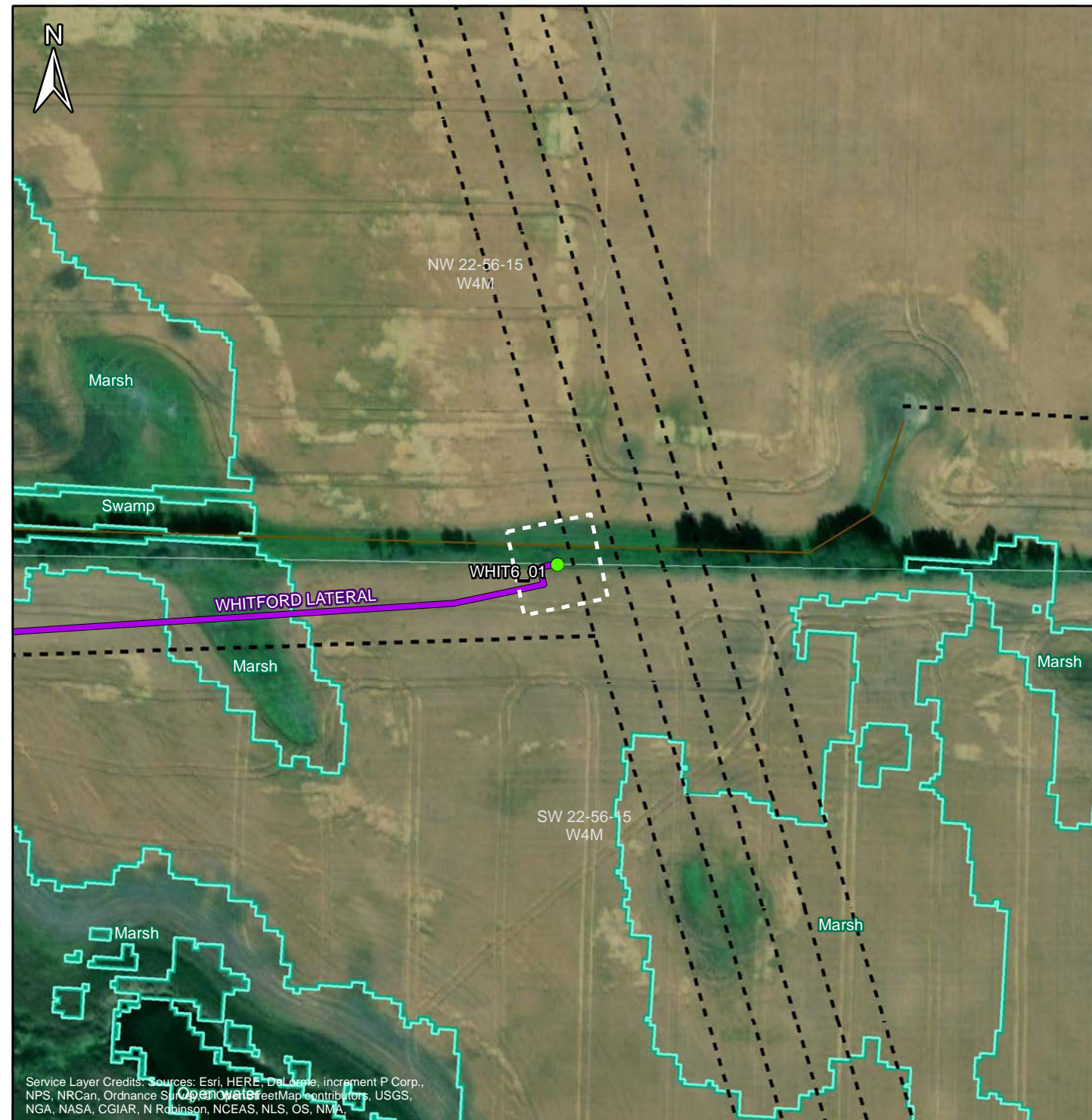


NGTL
2022 ABANDONMENT PROGRAM
WHI05 (WHIT6_02RD)

County of Two Hills No. 21, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.



LEGEND

- Isolation Point
- Lateral to be Abandoned In-place
- PDA
- Road
- Existing Pipeline (AER)
- Alberta Merged Wetland Inventory

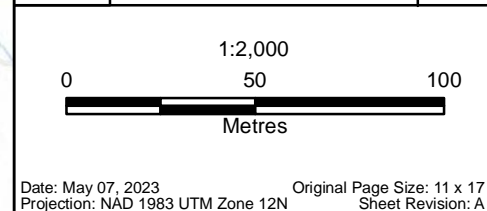
Please see Table on Page 2 for list of potential Species at Risk wildlife constraints that may interact within the PDA.

Service Layer Credits: Sources: Esri, HERE, DeLorme, InCREMENT P Corp., NPS, NRCAN, Ordnance Survey, OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA.

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PROGRAM COMPONENT	WHIT6_01	
PROJECT DISTURBANCE AREA ID	WHI06	
PLANNED ACTIVITIES	Isolation at NGTL line	
LEGAL LAND LOCATION	SW 22-56-15 W4M	
LAND OWNERSHIP	Freehold	
LAND USE	Agriculture, Developed	
RESOURCES AND CONSTRUCTION MITIGATION MEASURES	SOILS DESCRIPTION	<ul style="list-style-type: none"> Existing soil conditions for this PDA cannot be identified from publicly available data. It is expected soil orders are likely to be Solonchic, Chernozemic, Luvisolic, Brunisols, Organic and/or Regosolic.
	SOIL HANDLING / SOIL SALVAGE DEPTH AND CRITERIA	<ul style="list-style-type: none"> Where a gravel surface is in place, topsoil may be present beneath gravel. The EI will confirm applicable depths, however assume salvage of approximately 10-15 cm of topsoil is required within this area, and areas outside of gravel areas. Where work is to be conducted on an existing facility site, gravel will be salvaged and stockpiled separately, unless otherwise directed by the Company.
	WATERCOURSES	<ul style="list-style-type: none"> No watercourses within 30 m of the PDA. No watercourses within 100 m of the PDA.
	FISHERIES RESOURCES	<ul style="list-style-type: none"> No fish-bearing watercourses within 30m of the PDA. No fish-bearing watercourses within 100 m of the PDA.
	VEGETATION	<ul style="list-style-type: none"> No rare plants or rare ecological communities have been identified within the PDA. No rare plants or rare ecological communities have been identified within the 100 m of the PDA.
	WETLANDS	<ul style="list-style-type: none"> No wetlands have been identified within or intersecting the PDA. No wetlands have been identified within 100m of the PDA.
	WILDLIFE	<p>SRT OWL</p> <ul style="list-style-type: none"> Avoid physical abandonment activities (including clearing and reclamation) within 200 m as decided by a Qualified Professional of an identified short-eared owl active nest from April 15 to August 15.
	HISTORICAL RESOURCES	<ul style="list-style-type: none"> There are no known historical resources in the PDA.
	TRADITIONAL LAND USE	<ul style="list-style-type: none"> There are no known Traditional Land and Resource Use sites in the PDA.
	SITE CONTAMINATION CONSIDERATIONS	<ul style="list-style-type: none"> In the event contaminated soils or other materials are encountered during Project activities, implement the Contaminated Soils Contingency Plan (Appendix 1E of the EPP) and the Chemical and Waste Management Plan (Appendix 1F of the EPP). See notes on Page 1.
	ACCESS	<ul style="list-style-type: none"> Restrict all abandonment activities to the approved Project site. All Project traffic will adhere to safety and road closure regulations.
	RECLAMATION	<ul style="list-style-type: none"> See notes on Page 1 regarding reclamation. Where the pipe or a facility has been removed, as required, acquire an appropriate volume of fill to replace the void. Fill material must be approved in accordance with Company requirements prior to use.
	OTHER	



NGTL
2022 ABANDONMENT PROGRAM
WHI06 (WHIT6_01)

County of Two Hills No. 21, AB
PROJECT NO. TBD
Environmental Site Information Sheet

ERM
ERM PROJECT NO. 0679315

THE CURRENT VIEW OF THE FACILITY IS APPROXIMATE. FACILITY SIZE AND ORIENTATION WILL BE FURTHER REFINED DURING DETAILED ENGINEERING TO AVOID OVERLAP WITH EXISTING ROADS AND OTHER INFRASTRUCTURE, AND TO ALIGN WITH PROPERTY BOUNDARIES BASED ON DISCUSSIONS WITH POTENTIALLY AFFECTED LANDOWNERS. PERMANENT ACCESS ROAD TO THE FACILITY IS PRELIMINARY AND WILL BE REFINED DURING DETAILED ENGINEERING DESIGN.