

Wild Rose 2 Wind Power Project Amendment to the Environmental Evaluation



Prepared For

Wild Rose 2 Wind LP
Suite 2930, 155 Wellington Street West
Toronto, Ontario M5V 3H1

Prepared By

EDI Environmental Dynamics Inc.
400 – 622 5 Ave. SW
Calgary, AB T2P 0M6

EDI Contact

Daryl Johannesen
Senior Biologist

EDI Project

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AUTHORSHIP

Team members from EDI Environmental Dynamics Inc. who contributed to preparing this report include:

Jennifer Muir, M.Sc., P.Biol..... Primary Author
Susan Skinner, M.Sc. Contributing Author
Daryl Johannesen, M.Sc., P.Biol..... Senior Review



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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ABMI	Alberta Biodiversity Monitoring Institute
ACIMS	Alberta Conservation Information Management System
ACIS	Alberta Climate Information Service
AEP	Alberta Environment and Parks
AEP-WM	Alberta Environment and Parks – Wildlife Management
AESO	Alberta Electric System Operator
AIES	Alberta Interconnected Electric System
AUC	Alberta Utilities Commission
AWCS	Alberta Wetland Classification System
BBS	Breeding Bird Surveys
BMP	Best management practice
C&R Directive	Conservation and Reclamation Directive for Renewable Energy Operations
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
Directive	Wildlife Directive for Alberta Wind Energy Projects
ECCC	Environment and Climate Change Canada
EDI	EDI Environmental Dynamics Inc.
EE	Environmental Evaluation
EIS	Environmental Impact Statement
EPP	Environmental Protection Plan
ESA	Environmentally Significant Area
LOE	Letter of Enquiry
Magl	Metres above ground level
MW	Megawatt
PDSA	Pre-Disturbance Site Assessment
The Project	The Wild Rose 2 Wind Power Project
ROW	Right-of-Way
SARA	<i>Species at Risk Act</i>
SASR	System Access Service Request
STS	Supply Transmission Service
The Substation	Eagle Butte Substation
VEC	Valued Ecosystem Component



1 INTRODUCTION

Wild Rose 2 Wind GP Corp. (Wild Rose 2), on behalf of Wild Rose 2 Wind LP (each a subsidiary of Capstone Infrastructure Corporation), is approved by the Alberta Utilities Commission (AUC; Approval 27412-D02-2022; AUC 2022a) to construct and operate the Wild Rose 2 Wind Power Project (the Project), a wind energy facility in Cypress County, Alberta. The Project, located approximately 30 km south-east of Medicine Hat, Alberta, is situated within townships 09-04 W4M, 10-04 W4M, 09-05 W4M, and 10-05 W4M (see Attachment A).

Wild Rose 2 has been assessing new equipment for the Project and has optimized and updated the Project layout. The work has included final equipment selection and procurement, mitigation work to reduce Project effects (social and environmental), as well as preliminary construction planning.

EDI Environmental Dynamics Inc. (EDI) has been retained by Wild Rose 2 to prepare an Environmental Evaluation Amendment (i.e., the EE Amendment), considering the following past submissions to the AUC:

- Environmental Impact Statement (the Original EIS; Golder Associates Ltd. [Golder] 2010);
- Evaluation of Changes for the Wild Rose 2 Wind Power Project due to a Change in Turbine Supplier and Turbine Layout (Golder 2013); and,
- Evaluation of Changes for the Wild Rose 2 Wind Power Project due to a Change in Turbine Model and Turbine Layout (Golder 2016).

The EE Amendment provides a description of the proposed changes to the Original EIS since the last Evaluation of Changes memorandum was submitted for the Project (Golder 2016), in the context of updates to the AUC Rule 007: *Applications for Powerplants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines* (Rule 007; Alberta Utilities Commission [AUC] 2022). Wild Rose 2 previously received approval by the AUC for an Equipment Update for minor modifications to the Eagle Butte Substation (the Substation; 27479-D02-2022) and has subsequently filed an administrative change with the AUC on October 7, 2022 (Proceeding 27697) to rename the Eagle Butte Substation to the Wild Rose 2-owned portion of AltaLink Management Ltd's Elkwater 264S Substation. As such, this EE Amendment is for the remaining wind farm components (i.e., turbines and associated infrastructure, but not the substation).

To facilitate comparison and discussion within this EE Amendment, the Layout presented here will be referred to as the “Amended Layout”, and the prior layout reviewed in the 2016 Evaluation of Changes memorandum and subject to AUC Approval 27412-D02-2022, will be referred to as the “Approved Layout”. The Amended Layout is the same as that provided to Alberta Environment and Parks (AEP) for a Referral Report amendment for the Project. The structure of this EE Amendment follows a similar structure to that of the Original EIS and the previous Evaluation of Changes memoranda.



2 CONCORDANCE WITH AUC RULE 007 WP15

This EE Amendment has been prepared with the same structure to align with the Original EIS and previous Evaluation of Changes memoranda. The review of the Project is also in concordance with requirements outlined in WP15 of Section 4.4.4 of the AUC Rule 007 (AUC 2022; Table 1).

Table 1. Concordance with the AUC Rule 007 WP15 Requirements

WP15 Requirement	Applicable Report Section in the Original EIS	Applicable Report Section in this EE Amendment
Description of pre-project environmental and land use conditions in the local study area.	Section 4.0	Section 5
Identification and description of Project activities and infrastructure that may adversely affect the environment	Section 5.0	Section 4
Identification of specific ecosystem components within the local study area that may be adversely affected by the project: <ul style="list-style-type: none"> • Terrain and soils; • Surface water bodies and hydrology; • Groundwater; • Wetlands; • Vegetation species and communities; • Wildlife species and habitat; • Aquatic species and habitat; • Air quality; and, • Environmentally sensitive areas. 	Section 3.1	Section 5
Description of potential adverse effects of the project on the ecosystem components during the life of the project	Section 5.0	Section 4
Description of the methodology used to identify, evaluate and rate the adverse environmental effects and determine their significance, along with an explanation of the scientific rationale for choosing this methodology	Section 3.2	Golder 2010
Description of the mitigation measures proposed to be implemented during the life of the project to reduce the potential adverse effects	Section 5.0	Section 5
Description of the predicted residual adverse effects of the project and their significance after implementation of the proposed mitigation	Section 5.0	Section 5
Description of monitoring activities proposed to be implemented during the life of the project to verify the effectiveness of the proposed mitigation	Section 7.0	Section 6
List of the qualifications of the individual(s) who conducted or oversaw the environmental evaluation	N/A	Appendix A



3 PROJECT DESCRIPTION

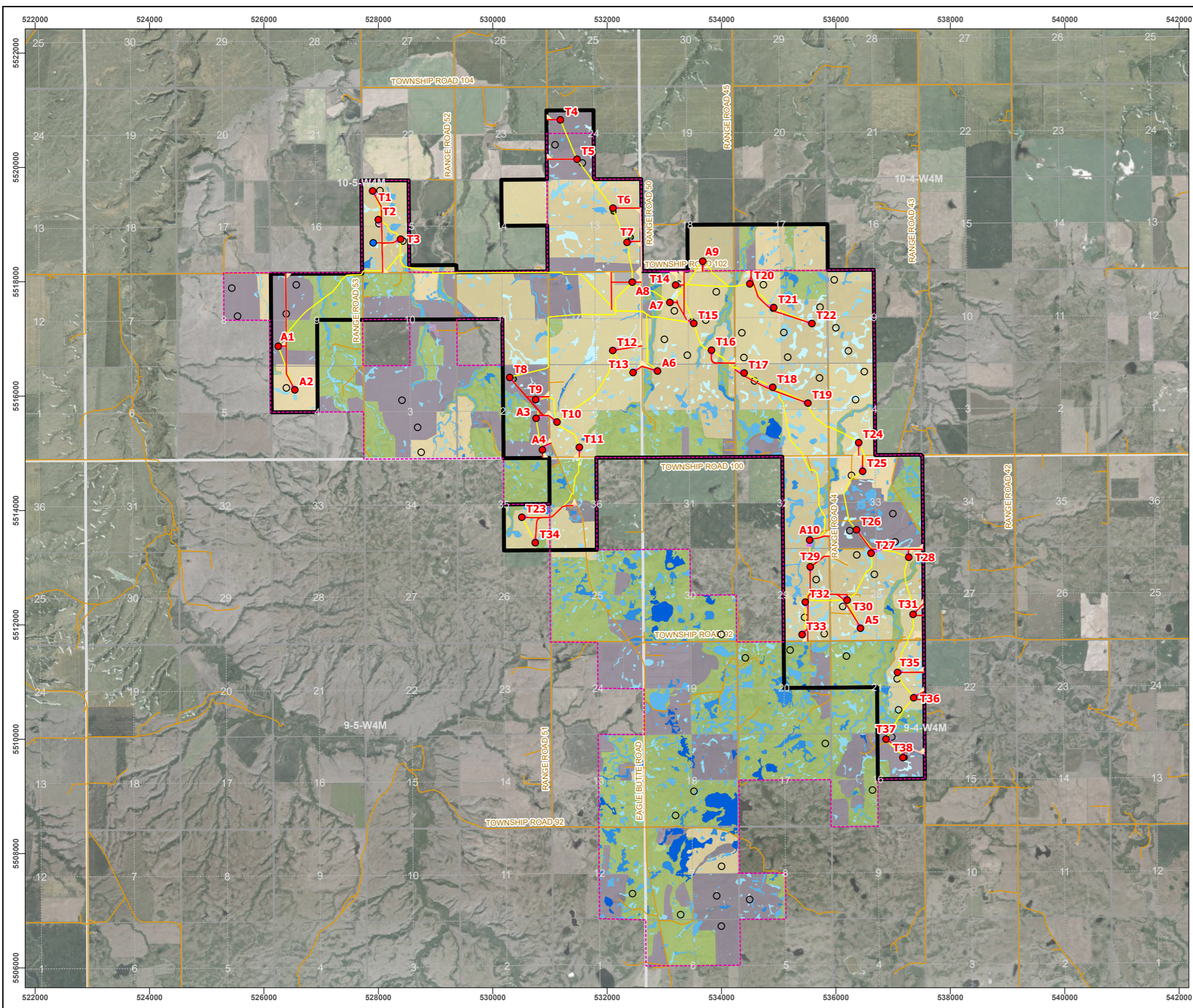
In the 2016 Evaluation of Changes memorandum¹, the review considered a layout consisting of 60 wind turbines (turbine model of Siemens SWT-3.2-113), with a total project capacity of 192 MW, and associated 34.5 kilovolt (kV) gathering system, access roads, laydown yard, operations and maintenance building, and other construction related components (e.g., temporary work areas, laydown areas).

Wild Rose 2 has redesigned the Project and identified the Amended Layout using different wind turbine generation technology from the past assessments. The change in turbine model and reduction in the number of turbines for the Project necessitated a change to the layout to optimize the energy generation from the existing wind resource, while complying with regulations related to setbacks (e.g., environmental and noise) and considering stakeholder feedback and landowner requests. This, in turn, resulted in a reduction in the Project Area, as less land was required to support the Project components (see Figure 1 showing the Approved Project Area and the Amended Project Area).

The preferred turbine model for the layout design work is the SGRE-145 5.2MW turbine model (hereafter referred to as the SGRE-145). The Amended Layout presented herein consists of 48 turbine locations and associated electrical infrastructure. It is noted that the proponent may in the end only build a smaller subset of this layout, because of other limitations and constraints for the Project, but in this way, the current evaluation is considered conservative, as assesses more turbines than will ultimately be built. Furthermore, the Amended Layout presented herein is also the same layout that has been evaluated by AEP for a Renewable Energy Amendment Letter² for the Project, and also the economic assessment process to determine the final 38 turbines in the layout has not yet been completed. Thus, this EE Amendment is a conservative assessment of the Amended Layout as it describes all potential turbine locations and Project components under consideration and includes some areas of turbine and infrastructure features that may not be built in the end. Broadly, the Amended Layout has been revised to reduce overall potential adverse environmental effects and maximize power generation potential, along with associated realignments of access road and collector line routes; all Project processes, products and components (with reductions and relocations) are expected to be similar to those presented for the Approved Layout.

¹ Golder Associates Ltd. 2016. Evaluation of Changes for the Wild Rose 2 Wind Power Project due to a Change in Turbine Model and Turbine Layout. Prepared for NaturEner Wild Rose 2 Energy Inc. 30 pp.

² Alberta Environment and Parks. 2022. Alberta Environment and Parks – Fish and Wildlife Stewardship Renewable Energy Amendment Letter. October 20, 2022. 7 pp.

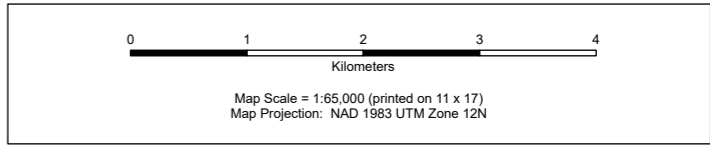
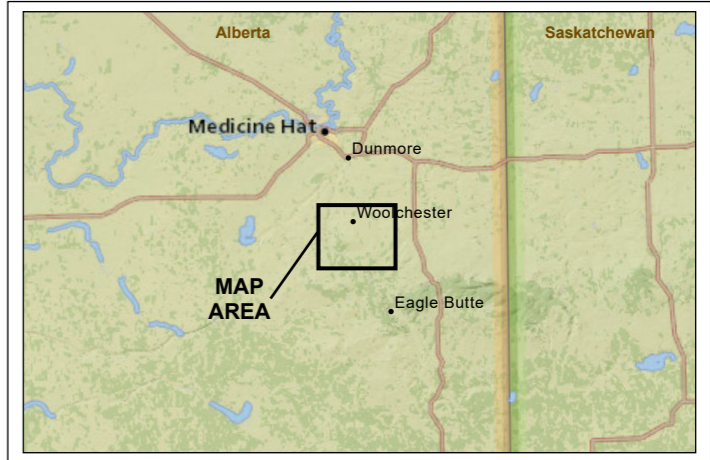


**Figure 1. Amended Wild Rose 2
Wind Power Project**

Wild Rose 2 Wind LP

Legend

Local Road	2016 Approved Project Area
Township	Amended Layout Project Area
Section	Land Cover
Quarter Section	Cultivated
Project Infrastructure	Farm Yard
2016 Approved Turbine Location	Native Grassland
MET Tower	Road
Turbine Location	Tame Pasture
Access - Existing	Trail or Unimproved Road
Access - Operational Disturbance	Wetland - Class I
Collector Line - Construction Disturbance	Wetland - Class II
Access - Construction Disturbance	Wetland - Class III
Turbine - Construction Disturbance	Wetland - Class IV
Laydown Area	Wetland - Class V



Data Sources

- Project Data. September 14, 2022. Wild Rose 2 Wind LP.
- 2016 Turbine Locations. August 16, 2016. Technical Memo. Golder Associates Ltd.
- Land Cover data. September 13, 2022. Golder Associates Ltd. and EDI Environmental Dynamics Inc.
- Wetland Data. September 14, 2022. EDI Environmental Dynamics Inc.
- Inset Basemap. National Geographic World Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Main Basemap. World Imagery: Cypress County, Earthstar Geographics

Disclaimer
EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data has been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

Drawn: C. Tennant	Checked: J. Muir	Figure 1	Date: 2022-10-14
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3.1 PROJECT COMPONENTS

Project activities during construction, operation and decommissioning phases associated with the Approved Layout and detailed in the EIS (Golder 2010), and updated in the Evaluation of Changes Technical Memorandum (Golder 2016), remain applicable today for the current Amended Layout.

The Project Area for the Amended Layout is approximately 4,669 ha, a reduction of 36% from the Project Area for the Approved Layout (7,262 ha; Figure 1). Seven quarter sections of land (SE 15-10-5, NE 14-10-5, NW 24-10-5, S 17-10-4, SE 18-10-4, and SE 35-9-5 W4M) have been added to the Project Area, but 46 have been removed, for a net decrease of 39 quarter sections or an approximate reduction of 2,593 ha (36%; **Error! Not a valid bookmark self-reference.**; Figure 1). Amended Layout Location.

Section	Township	Range	Meridian
16	9	4	W4M
21	9	4	W4M
28	9	4	W4M
29	9	4	W4M
32	9	4	W4M
33	9	4	W4M
4	10	4	W4M
5	10	4	W4M
6	10	4	W4M
7	10	4	W4M
8	10	4	W4M
35	9	5	W4M
36	9	5	W4M
1	10	5	W4M
2	10	5	W4M
4	10	5	W4M
9	10	5	W4M
10	10	5	W4M
11	10	5	W4M
12	10	5	W4M
13	10	5	W4M
15	10	5	W4M
24	10	5	W4M



Table 3 compares the construction footprint of the Amended Layout with that of the Approved Layout, showing a 35% (53.7 ha) reduction.

Table 2. Amended Layout Location.

Section	Township	Range	Meridian
16	9	4	W4M
21	9	4	W4M
28	9	4	W4M
29	9	4	W4M
32	9	4	W4M
33	9	4	W4M
4	10	4	W4M
5	10	4	W4M
6	10	4	W4M
7	10	4	W4M
8	10	4	W4M
35	9	5	W4M
36	9	5	W4M
1	10	5	W4M
2	10	5	W4M
4	10	5	W4M
9	10	5	W4M
10	10	5	W4M
11	10	5	W4M
12	10	5	W4M
13	10	5	W4M
15	10	5	W4M
24	10	5	W4M



Table 3. Comparison of Project Construction Footprints.

Project Component ¹	Approved Layout ²		Amended Layout ²		Change ¹	
	Length (km)	Area (ha)	Length (km)	Area (ha)	Length (km)	Area (ha)
Turbine Locations	N/A	36.9	N/A	37.7	N/A	0.8 (+2%)
Access Roads and Existing Trail Upgrades	32.2	45.0	25.9	42.0	6.3 (-20%)	3.0 (-7%)
Collector System	69.9	27.9	91.9	18.3	22.0 (+31%)	9.6 (-34%)
Crane Paths	28.8	40.1	N/A	N/A	N/A	N/A
Total	130.9	151.8	117.8	98.1	13.1 (-10%)	53.7 (-35%)

Notes:

- 1 Laydown areas, permanent met tower footprints, and existing trail upgrades were not included within area calculations for the Approved Layout and cannot be compared.
- 2 Some numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.
- 3 Total Amended Layout Project Area also includes laydown and permanent met tower footprints.

Wild Rose 2 has run a turbine supply procurement process for the Project for installation and commissioning of the site in 2023. The procurement requires new equipment for the site that will be suitable for the site location (i.e., site wind characteristics), satisfy Project constraints and noise requirements, and are commercially available to meet the Project timelines and commitments. The SGRE-145 turbine was the selected model coming out of the tender process, and Wild Rose 2 has since executed a turbine supply agreement with SGRE for delivery in 2023.

Table 4 compares turbine model specifications between the Amended Layout and the Approved Layout. While the Amended Layout presented here consists of 48 SGRE-145 turbines, the Amended Layout will be refined to a final subset of 38 of these turbines to be constructed on site. For actual operation of the site, it is noted that the nameplate capacity of the Project will increase to 197.6 MW, but the net output of megawatts injected to the Alberta Interconnected Electric System (AIES) grid will remain at 192 MW (i.e., no change is made to the System Access Service Request [SASR] or Supply Transmission Service [STS] value with the Alberta Electric System Operator [AESO]).

The SGRE-145 turbine model has a rotor diameter of 145m and a hub height of 95.5m above ground level (magl). These dimensions represent an increase of 28% and 3% when compared to the rotor diameter and hub heights approved for the Approved Layout model. Each SGRE-145 turbine has an increased rotor swept area of 65% when compared to the Siemens SWT-3.2-113 turbine model; however, overall, the total number of turbines has been greatly reduced for the Amended Layout.

The coordinates, land parcel, and land use type for all of the turbines in the Amended Layout are presented in Table 5. Construction disturbance has been reduced in the Amended Layout by 33%, and operational disturbance by 24%, when compared to the Approved Layout (Table 6).



Table 4. Turbine Model Specification Comparison.

Consideration	Approved Layout	Amended Layout	Change (%)
Manufacturer	Siemens	Siemens-Gamesa Renewable Energy	-
Model	SWT-113 3.2 MW	SGRE-145 5.2 MW	-
Turbine Capacity	3.2 MW	5.2 MW	2 MW (+63%)
Turbine Hub Height	92.5 magl	95.5 magl	3 magl (+3%)
Blade Length	56.5 m	72.5 m	16 m (+28%)
Rotor Diameter	113 m	145 m	32 m (+28%)
Rotor Swept Height	36 to 149 m	23 to 168 m	13 m (-36%) to 19 m (+13%)
Rotor Swept Area per Turbine	10,029 m ²	16,513 m ²	6,484 m ² (+65%)
Total Number of Turbines	60	48	12 (-20%)

Notes: magl = metres above ground level

Table 5. Turbine Coordinates and Land Cover Types.

Turbine ID	UTM Zone	UTM Easting	UTM Northing	QS	SEC	TWP	RGE	MER	Land Cover
A1	12	526250	5516873	SW	9	10	5	W4M	Tame Pasture
A2	12	526540	5516110	NW	4	10	5	W4M	Cultivated
A3	12	530758	5515612	SE	2	10	5	W4M	Tame Pasture
A4	12	530868	5515062	SE	2	10	5	W4M	Tame Pasture
A5	12	536429	5511941	SW	28	9	4	W4M	Cultivated
A6	12	532881	5516439	NW	6	10	4	W4M	Cultivated
A7	12	533096	5517639	NW	7	10	4	W4M	Cultivated
A8	12	532439	5517995	NE	12	10	5	W4M	Cultivated
A9	12	533672	5518360	SE	18	10	4	W4M	Cultivated
A10	12	535541	5513483	SE	32	9	4	W4M	Cultivated
T1	12	527899	5519590	NW	15	10	5	W4M	Cultivated
T2	12	528000	5519087	NW	15	10	5	W4M	Cultivated
T3	12	528389	5518745	SW	15	10	5	W4M	Cultivated
T4	12	531182	5520833	NW	24	10	5	W4M	Tame Pasture
T5	12	531474	5520144	SW	24	10	5	W4M	Tame Pasture
T6	12	532101	5519289	NE	13	10	5	W4M	Cultivated
T7	12	532348	5518690	SE	13	10	5	W4M	Cultivated
T8	12	530297	5516327	NE	2	10	5	W4M	Tame Pasture
T9	12	530750	5515940	NE	2	10	5	W4M	Tame Pasture
T10	12	531124	5515547	SW	1	10	5	W4M	Cultivated
T11	12	531514	5515106	SW	1	10	5	W4M	Cultivated
T12	12	532098	5516799	SE	12	10	5	W4M	Cultivated
T13	12	532453	5516414	NE	1	10	5	W4M	Cultivated
T14	12	533197	5517944	NW	7	10	4	W4M	Cultivated
T15	12	533516	5517273	SE	7	10	4	W4M	Cultivated



Turbine ID	UTM Zone	UTM Easting	UTM Northing	QS	SEC	TWP	RGE	MER	Land Cover
T16	12	533824	5516804	SE	7	10	4	W4M	Cultivated
T17	12	534395	5516405	NW	5	10	4	W4M	Cultivated
T18	12	534896	5516156	NW	5	10	4	W4M	Cultivated
T19	12	535510	5515878	NE	5	10	4	W4M	Cultivated
T20	12	534494	5517964	NW	8	10	4	W4M	Cultivated
T21	12	534913	5517550	NW	8	10	4	W4M	Cultivated
T22	12	535580	5517270	SE	8	10	4	W4M	Cultivated
T23	12	530508	5513883	SE	35	9	5	W4M	Cultivated
T24	12	536398	5515188	SW	4	10	4	W4M	Cultivated
T25	12	536468	5514686	NW	33	9	4	W4M	Cultivated
T26	12	536359	5513664	SW	33	9	4	W4M	Tame Pasture
T27	12	536614	5513253	NW	28	9	4	W4M	Cultivated
T28	12	537273	5513183	NE	28	9	4	W4M	Cultivated
T29	12	535551	5513016	NE	29	9	4	W4M	Cultivated
T30	12	536197	5512433	SW	28	9	4	W4M	Cultivated
T31	12	537348	5512184	SE	28	9	4	W4M	Cultivated
T32	12	535463	5512398	SE	29	9	4	W4M	Cultivated
T33	12	535409	5511832	SE	29	9	4	W4M	Cultivated
T34	12	530743	5513437	SE	35	9	5	W4M	Cultivated
T35	12	537076	5511169	NE	21	9	4	W4M	Cultivated
T36	12	537358	5510726	SE	21	9	4	W4M	Cultivated
T37	12	536875	5510002	NE	16	9	4	W4M	Tame Pasture
T38	12	537171	5509679	NE	16	9	4	W4M	Tame Pasture



Table 6. Comparison of land cover types encountered by the Approved and Amended Project Layouts.

Land Use			Cultivated Cropland ¹		Native Pasture ¹		Tame Pasture ¹		Wetland/Drainage ^{1,2}		Total ¹	
			Approved	Amended	Approved	Amended	Approved	Amended	Approved	Amended	Approved	Amended
Project Area	Area (ha)	--	2,663.7	2,636.9	2,344.5	705.8	1,639.8	697.8	614.0	567.9	7,262.0	4,668.8
	Percent of Project Area (%)	--	37	56	32	15	23	15	8	12	100	100
Turbine Locations	Number of Turbines ³	--	34	38	11	0	15	10	N/A	0	60	48
	Area (ha)	Construction	20.3	28.2	7.2	0.1	9.3	7.8	N/A	1.6	36.9	37.7
		Operations ³	2.6	0.5	0.8	0.0	1.1	0.1	N/A	0.0	4.6	0.7
Permanent Access Roads	Length (km)	--	16.3	17.1	5.9	0.3	10.0	5.2	N/A	1.7	32.2	25.9
	Area (ha)	Construction	22.8	26.5	8.2	0.8	13.9	8.6	N/A	3.9	45.0	27.5
		Operations ³	8.5	10.7	3.1	0.2	5.2	3.5	N/A	1.1	16.7	11.4
Crane Paths	Length (km)	--	14.7	N/A	6.5	N/A	6.3	N/A	1.3	N/A	28.8	N/A
	Area (ha)	Construction	20.5	N/A	9.1	N/A	8.7	N/A	1.9	N/A	40.1	N/A
Underground Collection System	Length (km)	--	38.3	65.7	12.4	5.8	16.6	14.5	2.7	3.6	69.9	91.9
	Area (ha)	Construction Only	15.7	12.7	4.8	1.7	6.3	2.7	1.1	0.6	27.9	18.3
Laydown	Area (ha)	Construction Only	Not provided	7.0	Not provided	N/A	Not provided	N/A	Not provided	N/A	Not provided	7.0
Permanent Met Tower	Area (ha)	Construction	Not provided	<0.1	Not provided	N/A	Not provided	N/A	Not provided	<0.1	Not provided	<0.1
		Operations ³	Not provided	N/A	Not provided	N/A	Not provided	N/A	Not provided	<0.1	Not provided	<0.1
Total Disturbance	Area (ha)	Construction	81.3	74.3	29.3	2.6	38.2	19.1	3.0	6.2	151.8	102.2
		Operations ³	11.1	11.3	3.9	0.2	6.3	3.6	N/A	1.1	21.3	16.2

Notes:

1 Some numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.

2 Temporary wetland disturbance will be avoided to the extent feasible by installing collector lines underneath the feature by means of horizontal directional drilling, as appropriate.

3 Dominant land use reported for each turbine.

4 Operational disturbance areas consider reclamation of areas disturbed during construction that will not be part of the operational disturbance footprint (e.g., temporary disturbance that is expected to revegetate during operations).



3.2 CHANGES TO PROJECT ACTIVITIES

Project activities during construction, operations, and decommissioning of the Amended Layout are expected to be the same as those outlined previously for the Approved Layout (Golder 2010, 2016); however, some alterations to Project infrastructure (e.g., access roads, collector lines) have been updated.

3.2.1 ACCESS

The Amended Layout will require 25.9 km of access roads, a decrease of 6.3 km from that required for the Approved Layout (32.2 km; Table 6). Access during construction of the Amended Layout will have a narrower access road (10 m wide) compared to the Approved Layout (14 m wide). The width of the access roads during operation will be increased slightly from 5.2 m for the Approved Layout to 6.0 m wide for the Amended Layout.

During construction, temporary intersection improvements will be required at various intersection locations to accommodate the safe delivery of turbine components via truck and trailers with large turning radii. Following delivery of turbine components, these temporary intersection improvements will be removed and reclaimed. Construction of these intersection improvements may require vegetation clearing, topsoil stripping, subsoil grading, compaction of subsoil and/or gravel application, depending on site-specific conditions.

3.2.2 TURBINE SITES

The larger SGRE-145 turbines for the Amended Layout will require larger staging sites, crane pads and temporary workspaces. The work area required at each of the 48 turbine locations for safe construction practices will range between 0.2 and 1.3 ha, which includes the crane pad. Temporary workspace for the Amended Layout ranges between 0.7 ha and 1.3 ha in size, in comparison to 0.8 ha for the Approved Layout. The size of the operational turbine footprint will be approximately 12 m in radius (approximately 0.05 ha), a reduction of 50% from the Approved Layout (15.9 m in radius; approximately 0.1 ha).

3.2.3 COLLECTOR SYSTEM

The Approved Layout required 69.9 km of underground collectors, and 8.5 km of overhead collectors. The Amended Layout has removed all overhead collectors (a 100% decrease), and will use 91.9 km of underground collectors, resulting in a conservative increase of 22.0 km (31%) of underground collectors (Table 6). While the Approved Layout required a disturbance footprint width of approximately 4.5 m, the Amended Layout will require 4 m, a decrease of 0.5 m (11%).

Similar to the Approved Layout, underground collectors for the Amended Layout will be installed by ploughing-in and/or trench excavation. Horizontal Directional Drilling (HDD) is planned to be used at strategic sensitive crossing locations (e.g., wetlands, drainages, roads) based on site-specific conditions.



3.2.4 TEMPORARY LAYDOWN AREA

While not included as part of the Approved Layout, the Amended Layout includes a 7.0 ha laydown area located on cultivated land at the north-east corner of NE 12-10-5 W4M (Figure 1; Table 6). The laydown area will be used during Project construction as a temporary storage and work area, and will be fully reclaimed once construction is complete. Furthermore, a small portion of this area along Township Road 102 will be used for the operation and maintenance building.

3.2.5 OPERATION AND MAINTENANCE BUILDING

For the Approved Layout, the operation and maintenance building was planned to be located with the substation. For the Amended Layout, the operation and maintenance building has been moved to be adjacent to Township Road 102, surrounded by the temporary laydown area planned in NE 12-10-5 W4M.

3.2.6 PERMANENT METEOROLOGICAL TOWER

A permanent meteorological tower is planned to be installed in SW 15-10-5 W4M. The meteorological tower will be free-standing with a construction footprint with a radius of approximately 15 m (approximately 650 m²) and a small basal operational footprint with a radius of 2.5 m (approximately 20 m²). Meteorological tower specifications or locations were not previously provided for the Approved Layout.

3.3 PROJECT SCHEDULE

Site preparation and commencement of construction of the Project (e.g., approaches, access, turbine pads) is scheduled to commence in Spring 2023. The remainder of the site construction, turbine deliveries and commissioning are planned to occur later in 2023, with commercial operation expected for December 31, 2023. Final site reclamation is anticipated to be completed in Summer 2024.



4 ENVIRONMENTAL EVALUATION UPDATE

The original Project EIS (Golder 2010) evaluated the predicted likely residual effects of the Project on social, economic, and environmental Valued Ecosystem Components (VECs). The overall conclusion of the EIS was that the Project could be developed and operated without causing significant adverse environmental effects (Golder 2010).

Subsequently, Evaluation of Changes Memoranda were completed for revisions to the Project Layout in 2013 (Golder 2013), and for the Approved Layout in 2016 (Golder 2016). Within these memoranda, the Project Layout was reduced by 45 turbines, and 3 turbines, respectively. The overall conclusions of these Evaluation of Changes Memoranda were that the Project could be developed and operated without causing significant adverse environmental effects (Golder 2013, 2016).

The VECs listed in Table 7 were evaluated in the EIS for potential effects and likely residual effects resulting from the Approved Layout (Golder 2016). Similar to previous Evaluation of Changes Memoranda, Table 7 includes rationale for assessing these VECs further in the following sections in the context of the requirements in paragraph WP 15 of the AUC Rule 007 (AUC 2022).

The following sections provide a summary of the assessed likely effects of the Amended Layout on the VECs for which changes are anticipated, including:

- terrain and soils;
- wetlands, surface water bodies and hydrology;
- vegetation species and communities, including environmentally sensitive areas; and,
- wildlife species and habitat.



Table 7. Valued Ecosystem Component Selection Table and Rationale for Further Evaluation for the Amended Layout

Valued Ecosystem Component(s) ¹	Rule 007 Specific Ecosystem Components ²	Rationale for Evaluation for the Amended Layout
Soil Quality	Terrain and Soils	Proposed changes could affect previous assessment results
Surface Hydrology	Aquatic Species and Habitat, Groundwater	Proposed changes are not expected to affect previous assessment results
Wetlands	Wetlands, Surface Water Bodies and Hydrology	Proposed changes could affect previous assessment results
Land Use, Native Pasture and Listed Plant Species	Vegetation Species and Communities, Environmentally Sensitive Areas	Proposed changes could affect previous assessment results
Bird and Bat Species, Listed Wildlife	Wildlife Species and Habitat	Proposed changes could affect previous assessment results
Air Quality	Air Quality	Proposed changes are not expected to affect previous assessment results
Noise Levels	N/A	Proposed changes addressed by updated Noise Impact Assessment (under separate cover)
Safety Issues	N/A	Proposed changes are not expected to affect previous assessment results
Employment	N/A	Proposed changes are not expected to affect previous assessment results
Heritage Resources	N/A	Will be addressed directly with Alberta Culture and Status of Women
Visual Aesthetics	N/A	Will be addressed with local stakeholders (under separate cover)
Radio Communications	N/A	Proposed changes are not expected to affect previous assessment results

Notes

- 1 Golder 2010
- 2 AUC 2022

4.1 TERRAIN AND SOILS

4.1.1 BASELINE UPDATE

Baseline information previously reported in Section 4.1.2 of the Project EIS (Golder 2010) remains applicable to the Amended Layout.

4.1.2 POTENTIAL EFFECTS

Similar to the Approved Layout, construction of the Amended Layout is expected to result in the temporary removal and short-term disturbance of topsoil. Site restoration is expected to return most soils to previous condition and land use capability (Golder 2010, 2016). During operations, topsoil on the Amended Layout footprint is expected to be displaced during the life of the Project to accommodate the operational footprint (i.e., access roads, turbine footprints; Golder 2010, 2016).



A decrease in the amount of disturbance to terrain and soils is anticipated, given that the Amended Layout has fewer turbines and less associated components. Following construction and reclamation of temporarily disturbed areas, only 16.2 ha of operational disturbance is anticipated for the Amended Layout, a 23% decrease from the Approved Layout.

4.1.3 MITIGATION MEASURES

Mitigation measures to reduce potential adverse effects of the Amended Layout on terrain and soils are the same as proposed in past Project submissions (Golder 2010, 2016, NaturEner 2019). The mitigation measures included in these past Project submissions have been evaluated in the context of the Amended Layout, and the following mitigation measures will be applied to the Project:

- Existing roads and trails have been incorporated within the Project design and will be used to the extent practical.
- Temporary crane paths will be designed to follow access roads or collector system to the extent practical.
- Activities that can contribute to soil compaction (heavy equipment and vehicle traffic) will be limited to surveyed rights-of-way (ROWs), leases and temporary workspaces on the site. The activity of heavy equipment will be restricted if wet soil conditions occur.
- Topsoil will be stripped to the thickness indicated by the soil survey for storage separate from the stripped subsoil. Soil piles will be low profile and stabilized as necessary. Topsoil will be placed over the replaced subsoil during site reclamation, for areas not required for operations.
- Reclamation of the sites, including seeding of disturbed areas, is expected to maintain the productivity of the soil for cultivation or grass production, which would minimize the exposure of soil to erosion.
- A site-specific Environmental Protection Plan (EPP) for the construction phase of the Project will be developed, including details related to environmental concerns (e.g., sensitive wildlife and vegetation), and procedures (e.g., salvage of topsoil and control of soil erosion).
- All Project activities will follow the EPP to minimize the potential for spills. Any spill site will be remediated in a timely manner.
- In accordance with the *Conservation and Reclamation Directive for Renewable Energy Operations* (Government of Alberta 2018a), a Pre-Disturbance Site Assessment (PDSA) will be completed for the Amended Layout prior to construction to inform site-specific reclamation.

4.1.4 RESIDUAL EFFECTS

With the implementation of these mitigation measures, the likely residual adverse effects of the Amended Layout on terrain and soils are predicted to be Low (i.e., same as predicted for the Approved Layout).



4.2 WETLANDS, SURFACE WATER BODIES AND HYDROLOGY

4.2.1 BASELINE UPDATE

Wetlands were historically identified, delineated and classified according to the Stewart and Kantrud (1971) wetland classification system in 2009 (Golder 2010), with supplemental studies completed in the south portion of the Approved Layout Project Area in 2013 (Golder 2016). Since then, the *Alberta Wetland Policy* was released (Government of Alberta 2013a) and a suite of wetland directives and guidance documents have followed as part of its implementation, including the *Alberta Wetland Identification and Delineation Directive* (Government of Alberta 2015) and the *Alberta Wetland Classification System* (Alberta Environment and Sustainable Resource Development 2015).

As such, wetland mapping was revised in 2021, to identify, classify and delineate wetlands potentially affected by the Amended Layout, in accordance with updated provincial procedures. An initial desktop review was completed by a qualified EDI wetland ecologist with the use of a variety of available data sources, including:

- Historic wetland mapping (Golder 2010, 2016);
- Aerial Photographic Record System historical aerial photographs (August 1, 1970; October 10, 1977; June 18, 1985; May 16 1992; April 27, 1998; August 6, 2012) (Government of Alberta 2022a);
- ESRI Satellite Imagery (2018);
- Alberta Biodiversity Monitoring Institute (ABMI) Wetland Inventory Data (Alberta Biodiversity Monitoring Institute 2022);
- Alberta Merged Wetland Inventory (AEP 2020b);
- AltaLis 1:20k topography data (contours) (AltaLIS Ltd. 2022); and
- Historical climate data (Government of Alberta 2022c).

For the purpose of the desktop review, wetlands were identified and delineated within the Amended Layout Project Area following Pathway 5 – Comprehensive Desktop Delineation with Field Verification (Government of Alberta 2015). Wetland permanence was assessed according to the *Guide for Assessing Permanence of Wetland Basins* (Alberta Environment and Parks 2016), including analysis of historical climate data and air photos to establish the duration of flooding and wetland inundation across changes in seasons and precipitation. All wetlands identified and mapped within the Amended Layout Project Area were classified according to the *Alberta Wetland Classification System* (AWCS) (Alberta Environment and Sustainable Resource Development 2015).

To select aerial photographs representative of the wetlands over time, yearly, monthly and daily precipitation data from 1956-2021 were obtained from the Alberta Agriculture and Rural Developments' Alberta Climate Information Service (ACIS) (Government of Alberta 2022b). Using this information, available imagery was correlated with historical meteorological data to choose historical air photos from normal, dry and wet time



periods. Imagery was chosen based on years and seasons most appropriate for the wetland classes examined and availability of useful imagery.

Following the desktop review, a targeted field survey was completed from October 13 to October 16, 2021, to verify desktop wetland classifications and delineations. Following the field survey, desktop wetland data was updated to reflect field observations.

4.2.2 POTENTIAL EFFECTS

The Amended Layout has been designed to avoid wetlands to the extent practical. In accordance with the Directive, a setback of 100 m from wetlands of Class III (Seasonal) or above from all Amended Layout infrastructure and of 172.5 m (100 m plus blade length) from all turbines has been employed where feasible (Figure 2a – d).

Given the updated revisions to wetland mapping, the potential effects of the Approved Layout and the Amended Layout are not directly comparable. The majority of wetlands identified within the Project Area are within or cross privately-owned, agricultural land (i.e., cultivation and pasture) noted to be chronically disturbed by agricultural activity. For the Amended Layout, the majority of construction disturbance to wetlands (85% or 5.3 ha) is expected to occur to the lower class (Class I and II) wetlands, located in agricultural fields. The wetland disturbances include 3.3 ha for Project access, 1.6 ha for turbine construction sites, and 0.3 ha for collector line installation. Similarly, the majority of operational disturbance to wetlands (91% or 1.0 ha) is within Class I and II wetlands associated with access (1.0 ha) and small areas (<0.1 ha in total) of portions of the meteorological tower and turbine footprints.

While access roads in the Approved Layout avoided wetlands, portions of four seasonal graminoid marsh wetlands (M-G-III; Wetlands 140, 168, 750, and 1707; Figure 3b) previously disturbed by construction of existing grid roads are anticipated to be disturbed by the Amended Layout; specifically, construction and operation of the access to Turbines T16, A6, and A10. In total, up to 0.64 ha of disturbance is anticipated during construction, and 0.14 ha of disturbance to wetlands Class III or above is expected through operations (Table 8).

While six Class III or above wetlands were anticipated to be crossed by collector lines for the Approved Layout, one Class III wetland chronically disturbed by cultivation is anticipated to be temporarily disturbed by collector installation for the Amended Layout (0.04 ha). In addition, fifteen Class III or above wetlands (mostly associated with drainages previously disturbed by construction of grid roads) are anticipated to be avoided by the Amended Layout with the use of horizontal directional drilling or by collector installation within the existing road ditch during the construction of the Amended Layout (Table 8). In total, 0.64 ha of disturbance to wetlands Class III or above is anticipated during construction, with 0.14 ha of disturbance expected to persist into operations of the Amended Layout (Table 8).

Table 9 summarizes Class III or above wetland occurrences within 100 m of the Amended Layout, and the rationale for the siting decision. In total, the Amended Layout is located within a 100 m setback of 65 Class III or above wetlands (i.e., within the setback but with no direct effects).



Table 8. Amended Layout Components with the Potential to Disturb Class III or Above Wetlands.

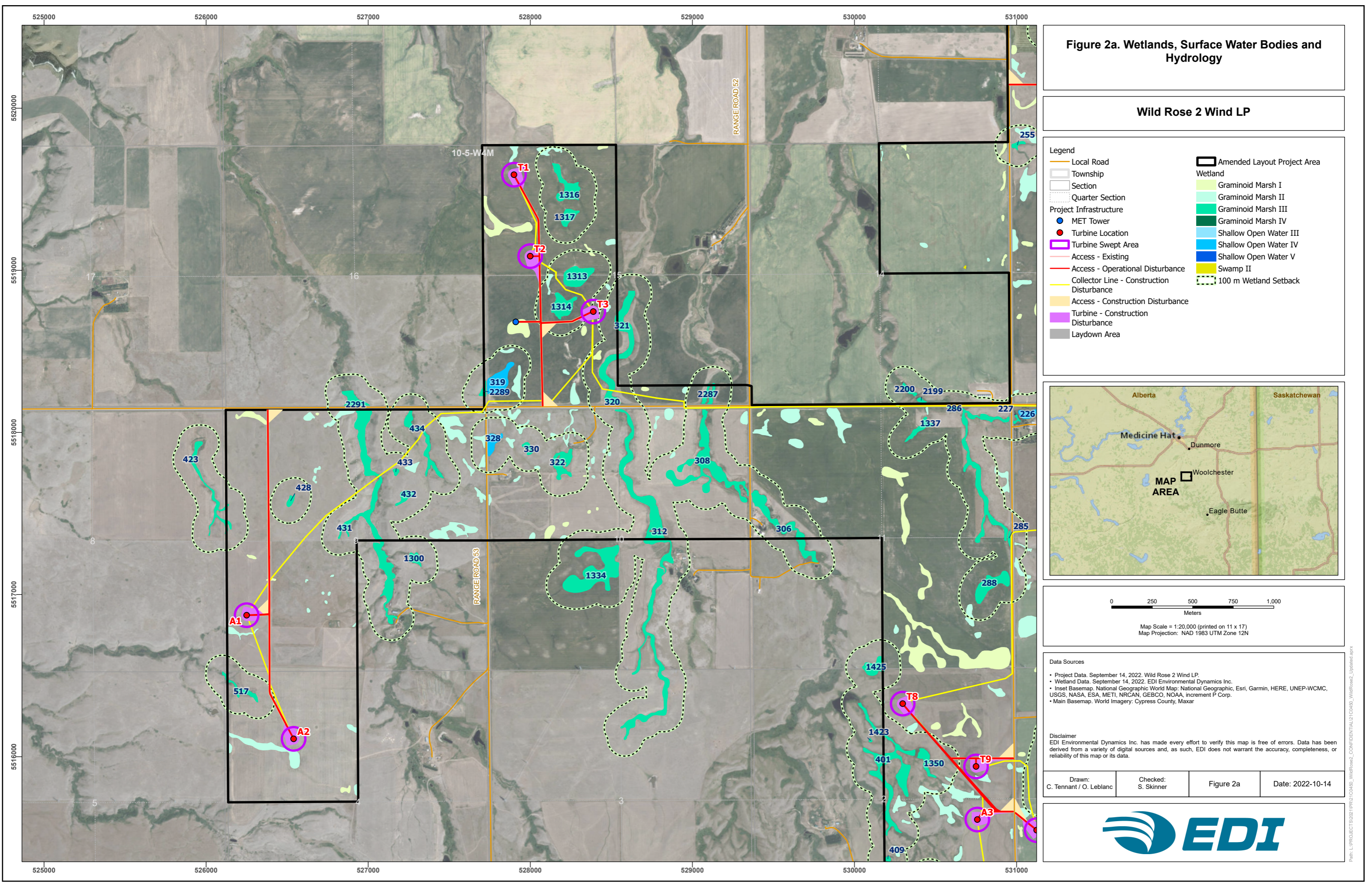
Wetland Name/ID	Wetland Class ^{1,2}	Proposed Infrastructure Type	Construction Disturbance (ha)	Operational Disturbance (ha)	Disturbance Avoided?	Rationale/Justification for Siting
140	M/G/III	Collector	0.04	-	Yes	Disturbance anticipated to be avoided with the use of Horizontal Directional Drilling (HDD).
		Access	0.06	0.04	No	Disturbance associated with access to Turbine T16. Balancing competing constraints.
168	M/G/III	Collector	0.03	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
		Access	0.19	0.03	No	Disturbance associated with access to Turbine A6. Balancing competing constraints.
1707	M/G/III	Collector	0.06	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
		Access	0.05	0.04	No	Disturbance associated with access to Turbines A10 and T29. Balancing competing constraints.
1988	M/G/III	Collector	0.04	-	No	Balancing competing constraints.
200	M/G/III	Collector	0.04	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
226	M/G/III	Collector	<0.01	-	Yes	Disturbance anticipated to be avoided through collector installation within the existing road ditch.
2364	M/G/III	Collector	<0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
2365	M/G/III	Collector	0.02	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
2380	M/G/III	Collector	0.02	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
31	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
320	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
431	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.

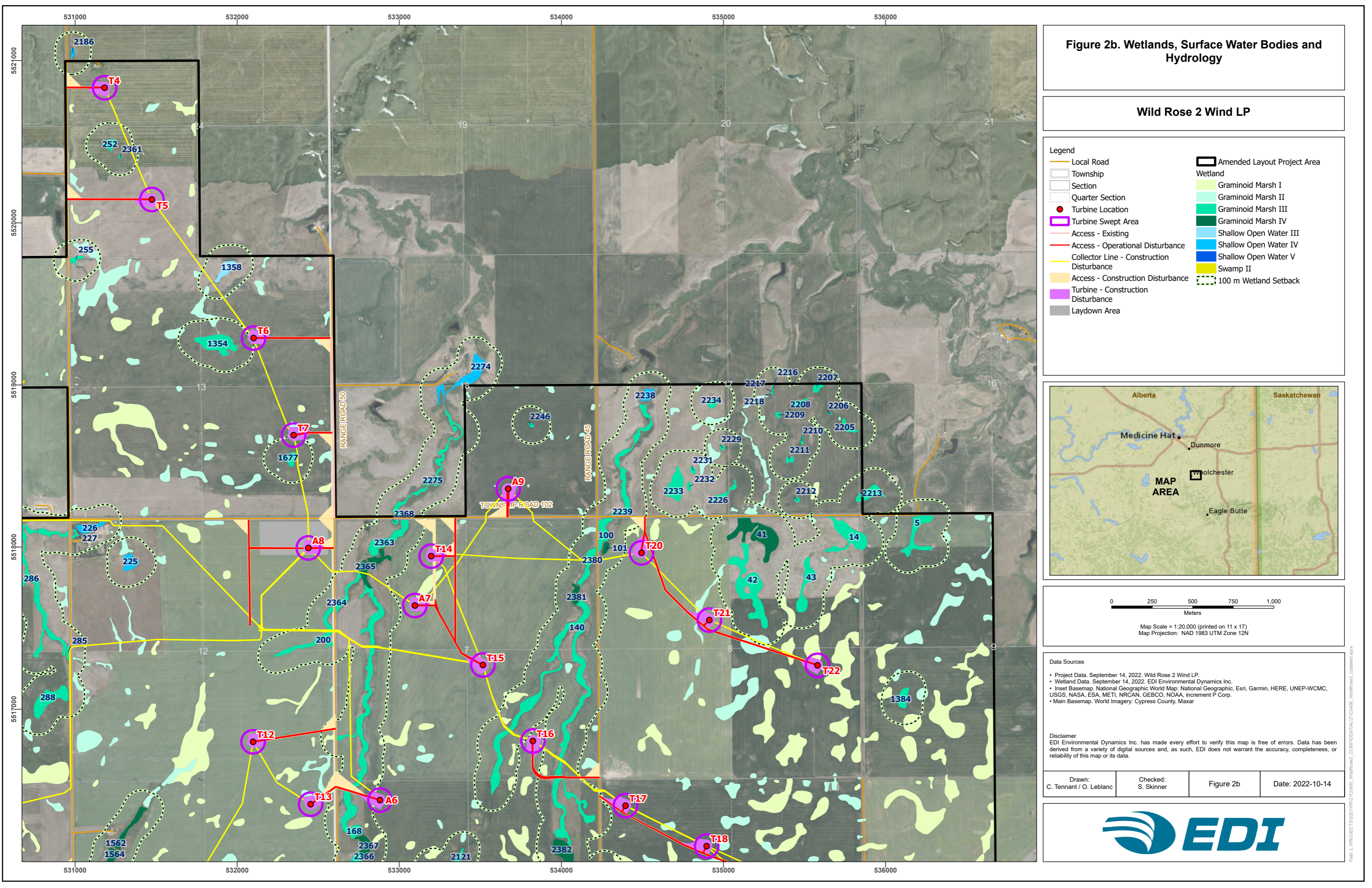


Wetland Name/ID	Wetland Class ^{1,2}	Proposed Infrastructure Type	Construction Disturbance (ha)	Operational Disturbance (ha)	Disturbance Avoided?	Rationale/Justification for Siting
434	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
532	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
533	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
587	M/G/III	Collector	0.01	-	Yes	Disturbance anticipated to be avoided with the use of HDD.
750	M/G/III	Access	0.30	0.04	No	Disturbance associated with access to Turbine A6.
Total Potential Wetland Disturbance (ha)			0.91	0.14		
Total Wetland Disturbance Avoided (ha)			0.27	-		
Total Anticipated Wetland Disturbance (ha)			0.64	0.14		

Notes

- 1 Alberta Wetland Classification System (Alberta Environment and Sustainable Resource Development 2015).
- 2 Roman numerals are equivalent to wetland classes described in Stewart and Kantrud (1971).





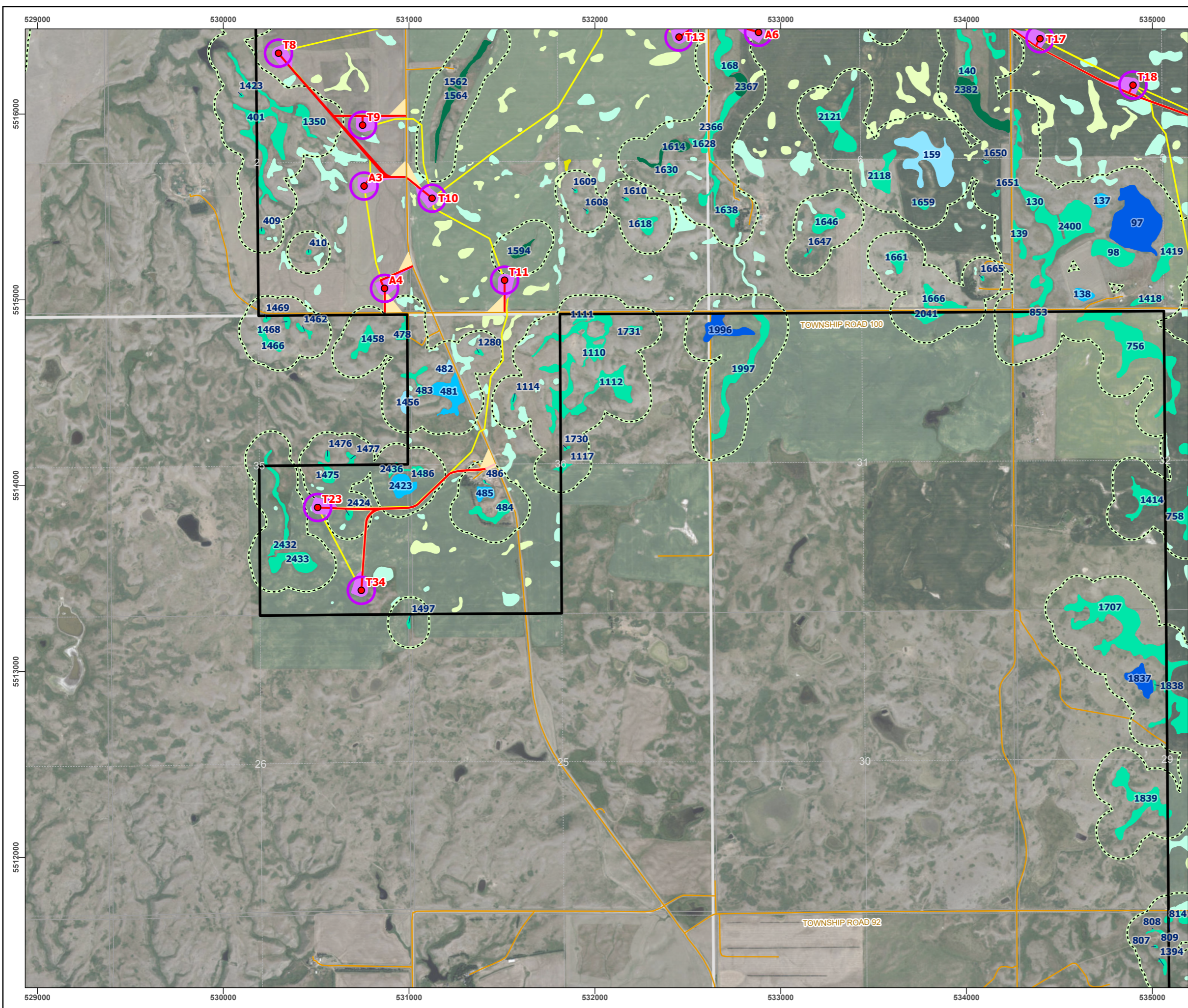


Figure 2c. Wetlands, Surface Water Bodies and Hydrology

Wild Rose 2 Wind LP

Legend

Local Road	Amended Layout Project Area
Township	Wetland
Section	Graminoid Marsh I
Quarter Section	Graminoid Marsh II
Turbine Location	Graminoid Marsh III
Turbine Swept Area	Graminoid Marsh IV
Access - Existing	Shallow Open Water III
Access - Operational Disturbance	Shallow Open Water IV
Collector Line - Construction Disturbance	Shallow Open Water V
Access - Construction Disturbance	Swamp II
Turbine - Construction Disturbance	100 m Wetland Setback
Laydown Area	



0 250 500 750 1,000
Meters

Map Scale = 1:20,000 (printed on 11 x 17)
Map Projection: NAD 1983 UTM Zone 12N

Data Sources

- Project Data, September 14, 2022, Wild Rose 2 Wind LP.
- Wetland Data, September 14, 2022, EDI Environmental Dynamics Inc.
- Inset Basemap, National Geographic World Map; National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Main Basemap, World Imagery: Cypress County, Maxar

Disclaimer
EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data has been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

Drawn: C. Tennant / O. Leblanc	Checked: S. Skinner	Figure 2c	Date: 2022-10-14
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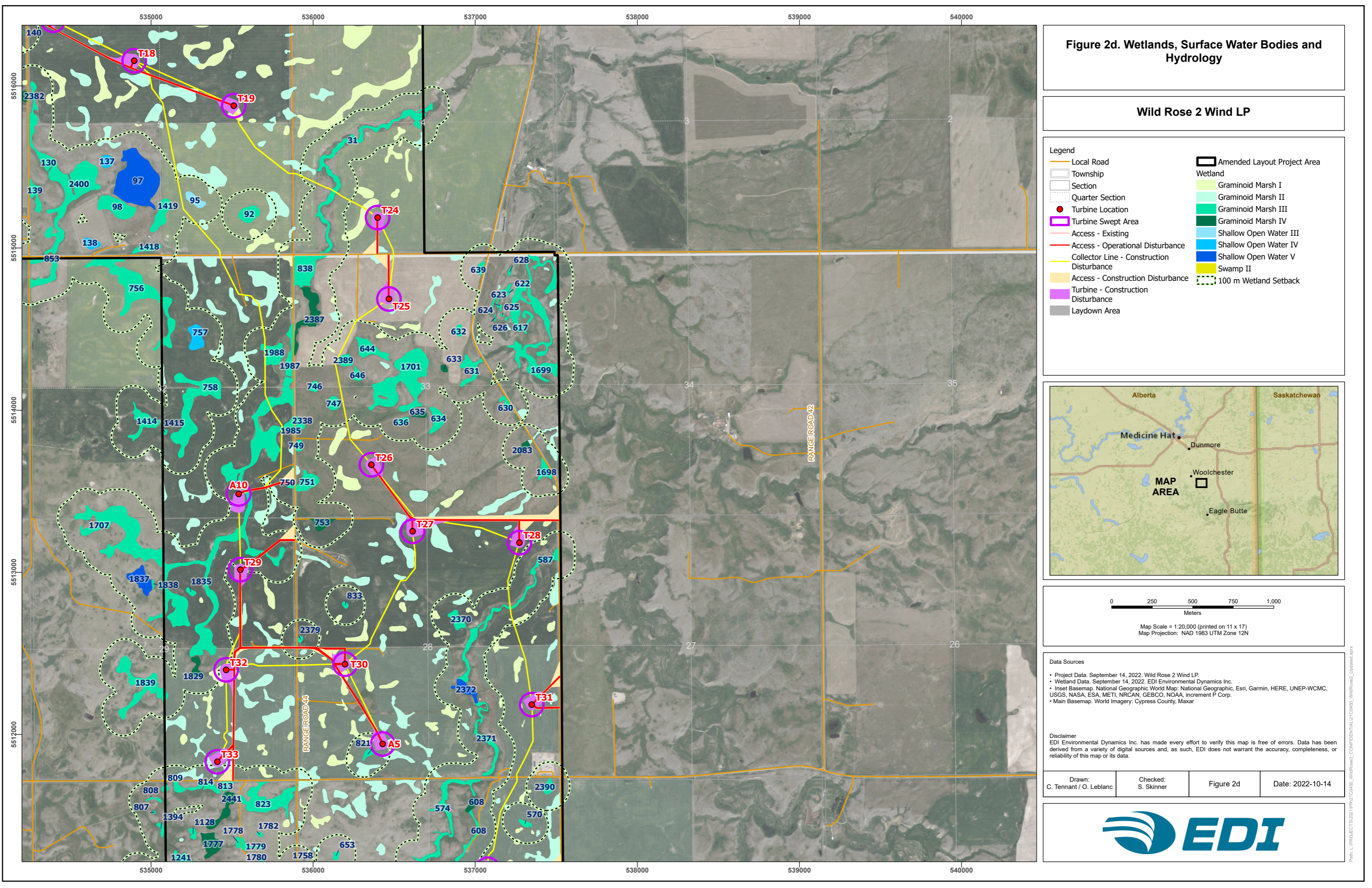




Table 9. Amended Layout Components Sited within 100 m of Class III or Above Wetlands.

Wetland Name/ID	Wetland Class ^{1,2}	Nearest Proposed Infrastructure Type Within Setback ^{3,4}	Proximity of Infrastructure to the Nearest Wetland Edge (m)	Rationale/Justification for Siting
42	M-G-III	Collector (C)	86.71	Temporary disturbance. Class III portion of the wetland basin is >100 m from infrastructure.
95	W-III	Collector (C)	27.22	Temporary disturbance.
100	M-G-III	Collector (C)	41.86	Associated with drainage; temporary disturbance.
101	M-G-IV	Collector (C)	28.23	Associated with drainage; temporary disturbance. Anthropogenically disturbed (dugout).
227	M-G-III	Collector (C)	53.46	Temporary disturbance.
252	M-G-III	Collector (C)	60.80	Temporary disturbance.
285	M-G-III	Collector (C)	4.35	Wetland located along edge of Eagle Butte Road; temporary disturbance.
286	M-G-III	Collector (C)	4.65	Associated with drainage; temporary disturbance.
288	M-G-III	Collector (C)	9.39	Temporary disturbance.
308	M-G-III	Collector (C)	7.73	Temporary disturbance.
319	W-IV	Collector (C)	42.14	Temporary disturbance.
321	M-G-III	Turbine (T3)	65.60	Associated with drainage; balancing competing constraints.
433	M-G-III	Collector (C)	14.65	Temporary disturbance.
478	M-G-III	Access (C)	19.21	Balancing competing constraints.
485	W-IV	Access (C)	82.67	Access parallels existing disturbance (farmyard); wetland is anthropogenically disturbed (dugout).
486	M-G-III	Access (C)	51.11	Access parallels existing disturbance (farmyard).
517	M-G-III	Access (C)	75.50	Balancing competing constraints.
522	M-G-III	Access (C)	29.28	Access parallels existing road; wetland is anthropogenically disturbed (dugout).
539	M-G-III	Turbine (T37)	37.07	Balancing competing constraints.
608	M-G-III	Turbine (T35)	97.75	Balancing competing constraints.
644	M-G-III	Collector (C)	41.23	Temporary disturbance.
646	M-G-III	Collector (C)	85.62	Temporary disturbance.
747	M-G-III	Collector (C)	17.21	Temporary disturbance.
749	M-G-III	Collector (C)	84.61	Temporary disturbance.
751	M-G-III	Access (C)	11.73	Balancing competing constraints.



Wetland Name/ID	Wetland Class ^{1,2}	Nearest Proposed Infrastructure Type Within Setback ^{3,4}	Proximity of Infrastructure to the Nearest Wetland Edge (m)	Rationale/Justification for Siting
813	M-G-III	Access (C)	8.38	Disturbance is located on the opposite side of Township Road 92 from the wetland.
814	M-G-III	Access (C)	36.01	Disturbance is located on the opposite side of Township Road 92 from the wetland.
821	M-G-III	Turbine (A5)	3.96	Balancing competing constraints.
1000	M-G-III	Access (C)	51.64	Disturbance is located on opposite side of Range Road 43 from the wetland; wetland is anthropogenically disturbed (dugout).
1039	M-G-III	Access (C)	23.72	Disturbance is located on opposite side of Range Road 43 from the wetland; access parallels existing road.
1040	M-G-III	Access (C)	69.98	Disturbance is located on opposite side of Range Road 43 from the wetland; access parallels existing road.
1280	M-G-III	Collector (C)	99.26	Temporary disturbance.
1313	M-G-III	Collector (C)	13.41	Temporary disturbance.
1314	M-G-III	Access (C)	10.32	Balancing competing constraints.
1337	M-G-III	Collector (C)	63.01	Temporary disturbance.
1350	M-G-III	Access (O)	39.19	Associated with drainage; wetland is anthropogenically disturbed (dugout).
1354	M-G-III	Turbine (T6)	41.46	Balancing competing constraints.
1358	W-III	Collector (C)	26.97	Temporary disturbance, wetland is anthropogenically disturbed.
1388	M-G-IV	Collector (C)	5.28	Temporary disturbance.
1419	M-G-III	Collector (C)	69.65	Temporary disturbance.
1475	M-G-III	Turbine (T23)	68.70	Balancing competing constraints.
1486	M-G-III	Collector (C)	76.05	Utilizing and existing road approach and disturbance (farmyard); balancing competing constraints.
1564	M-G-IV	Collector (C)	58.93	Temporary disturbance; wetland is anthropogenically disturbed.
1594	M-G-IV	Turbine (T11)	55.22	Wetland is anthropogenically disturbed; balancing competing constraints.
1677	M-G-III	Collector (C)	3.28	Temporary disturbance.
1829	M-G-IV	Turbine (T32)	75.49	Balancing competing constraints.
1985	M-G-III	Collector (C)	7.72	Temporary disturbance.
2186	W-IV	Access (C)	95.66	Temporary disturbance.
2199	M-G-III	Collector (C)	19.05	Temporary disturbance.
2200	M-G-III	Collector (C)	58.61	Temporary disturbance.



Wetland Name/ID	Wetland Class ^{1,2}	Nearest Proposed Infrastructure Type Within Setback ^{3,4}	Proximity of Infrastructure to the Nearest Wetland Edge (m)	Rationale/Justification for Siting
2239	M-G-III	Access (C)	26.31	Associated with drainage; disturbance is located on opposite side of Township Road 201 from the wetland.
2275	M-G-III	Access (C)	77.39	Balancing competing constraints.
2285	M-G-III	Access (C)	42.45	Disturbance is located on opposite side of Range Road 43 from the wetland.
2287	M-G-III	Collector (C)	21.32	Temporary disturbance.
2289	M-G-III	Collector (C)	31.39	Temporary disturbance.
2338	M-G-III	Collector (C)	80.98	Temporary disturbance.
2361	M-G-III	Collector (C)	62.64	Temporary disturbance.
2363	M-G-III	Access (C)	41.49	Balancing competing constraints.
2379	M-G-III	Access (C)	25.95	Balancing competing constraints.
2389	M-G-III	Collector (C)	2.10	Temporary disturbance.
2407	M-G-III	Access (O)	14.67	Disturbance is located on opposite side of Range Road 43 from the wetland.
2423	M-G-IV	Collector (C)	42.82	Balancing competing constraints; utilizing and existing road approach and disturbance (farmyard); wetland is anthropogenically disturbed.
2424	M-G-III	Access (C)	0.03	Balancing competing constraints.
2432	M-G-III	Turbine (T23)	90.39	Associated with drainage; balancing competing constraints.
2441	M-G-IV	Access (C, O)	70.18	Disturbance is located on the opposite side of Township Road 92 from the wetland.

Notes

- 1 Alberta Wetland Classification System (Alberta Environment and Sustainable Resource Development 2015).
- 2 Roman numerals are equivalent to wetland classes described in Stewart and Kantrud (1971).
- 3 C = Construction Disturbance, O = Operation Disturbance. Turbine setbacks are measured from the tip of the rotor blade.



4.2.3 MITIGATION MEASURES

The majority of mitigation measures to reduce potential adverse effects of the Amended Layout on wetlands, surface water bodies, and hydrology are the same as summarized in past Project submissions (Golder 2010, 2016, NaturEner 2019). The mitigation measures included in these past Project submissions have been evaluated in the context of the Amended Layout, and the following mitigation measures will be applied to the Project:

- The AEP Code of Practice for Watercourse Crossings will be adhered to.
- The use of culverts at ditch and water run crossings is expected to maintain site drainage. Reclamation of the site will be designed to re-establish natural drainage patterns.
- Turbines have been sited at least 172.5 m (turbine blade length + 100 m) from all wetlands, where feasible.
- Where practical, other project components (e.g., access roads, and collector lines) have been set back 100 m from all wetlands Class III and above.
- Construction will occur during dry or frozen ground conditions to the extent practicable.
- Rig matting, geotextiles, vegetated buffer zones, earthen berms and/or silt fencing will be implemented, as appropriate.
- Equipment will be routed around wetlands where feasible.
- Existing disturbance corridors (e.g., Eagle Butte Road) were followed to the extent practical.
- Any disturbances to wetlands that can not be avoided by the Amended Layout will be addressed appropriately as per the requirements of the *Water Act* and/or the *Alberta Wetland Policy*.
- Wetland replacement fees, as appropriate, will be paid to AEP in accordance with Alberta Wetland Policy requirements.
- Wetlands will be clearly marked prior to start of construction to prevent vehicle traffic from entering the wetland boundary.
- Where temporary wetland crossings are required for collector lines, crossings will be conducted during dry or frozen conditions where feasible.
- Following the construction phase, temporary access roads and workspaces immediately adjacent to wetlands will be re-vegetated as quickly as feasible to reduce the potential for siltation. The batch plant will include a settling pond to contain and treat wastewater, as necessary.
- A site-specific EPP for the construction phase of the Project will be developed, including details related to environmental concerns (e.g., sensitive wildlife and vegetation), and procedures (e.g., salvage of topsoil and control of soil erosion).
- All Project activities will follow Best Management Practices (BMPs) and the EPP to reduce sedimentation and prevent spills.
- Soil management and erosion control methods will be developed and presented in the EPP.



- Erosion control measures will be employed around turbine locations, the Operations and Maintenance facility, and access roads including re-vegetation or placement of large diameter rock on slopes and the installation of berms, as appropriate.

4.2.4 RESIDUAL EFFECTS

With the implementation of these mitigation measures, the likely residual adverse effects of the Amended Layout on wetlands, surface water bodies, and hydrology are predicted to be Low (i.e., the same as predicted for the Approved Layout).

4.3 VEGETATION SPECIES AND COMMUNITIES

4.3.1 BASELINE UPDATE

Baseline information previously reported in Section 4.1.2 of the Project EIS (Golder 2010) remains applicable to the Amended Layout. Land use mapping was undertaken within SE 35-9-5 and SE 18-10-4 W4M as these quarters were added to the Amended Layout Project Area (Figure 1).

4.3.2 POTENTIAL EFFECTS

4.3.2.1 Native Pasture

All turbines of the Amended Layout are located within agricultural lands (i.e., cultivated cropland and tame pasture). While the Approved Layout sited 11 turbines within native pasture, the Amended Layout has removed all turbines from native pasture. Portions of the Amended Layout are located within native pasture, including up to 1.7 ha of temporary construction disturbance during collector line installation, <0.1 ha of temporary workspace at turbine A6, and 0.8 ha and 0.2 ha of construction and operational disturbance, respectively, for road access to turbines T7, T13, T16, A6, and A10 (Figure 1; Table 10). In comparison with the Approved Layout, the Amended Layout has reduced construction disturbance on native pasture by 33% (Table 10). The majority of drainages within the Project Area support native pasture.

Table 11 provides the legal location, proposed infrastructure type and area affected within the native pasture/wetland drainage habitat type. Where these features are crossed by the Amended Layout, they were defined as narrow, shallow, drainages with slopes that prevent cultivation and that allow the native pasture to persist within the drainage, with chronic disturbance from agricultural land use abutting the top of the drainage. The value of these drainage features as wildlife habitat is limited by their small size and lack of topographic diversity, as compared to a larger, more complex coulee, which these wetland drainages eventually lead to, outside the Amended Layout Project Area.



Table 10. Native Pasture Encountered by the Amended Layout.

Land Cover Type	Approved Layout			Amended Layout		
	Total Project Area (ha) ¹	Construction Footprint (ha) ¹	Operational Footprint (ha) ¹	Total Project Area (ha) ¹	Construction Footprint (ha) ¹	Operational Footprint (ha) ¹
Native Pasture	2,344.5	3.9	0.1	705.8 (-70%)	2.6 (-33%)	0.2 (+100%)

Notes

- 1 Some numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.
- 2 Temporary disturbance to wetlands and native pasture associated with drainages will be avoided to the extent feasible by installing collector lines underneath the feature by means of horizontal directional drilling, as appropriate.

Table 11. Amended Layout infrastructure within native pasture/wetland drainage habitat types

Legal Location (W4M)	Proposed Infrastructure Type within Setback ¹	Area of Disturbance (ha) ²	Rationale/Justification for Siting
NE 1-10-5	Access (C)	0.02	Balancing competing constraints.
	Access (O)	<0.01	
NE 28-9-4	Collector (C)	0.02	Disturbance anticipated to be avoided with the use of Horizontal Directional Drilling (HDD).
NW 12-10-5	Collector (C)	0.06	Collector is anticipated to be ploughed in within the existing road ditch.
NW 6-10-4	Collector (C)	0.07	Disturbance anticipated to be avoided with the use of HDD.
	Access (C)	0.45	
	Access (O)	0.09	
	Turbine (C)	0.04	
NW 7-10-4	Collector (C)	0.08	Disturbance anticipated to be avoided with the use of HDD.
NW 8-10-4	Collector (C)	0.04	Disturbance anticipated to be avoided with the use of HDD.
SE 13-10-5	Access (C)	0.07	Balancing competing constraints.
	Access (O)	<0.01	
SE 14-10-5	Collector (C)	0.11	Collector is anticipated to be ploughed-in within the existing road ditch.
SE 21-9-4	Collector (C)	0.18	Some disturbance anticipated to be avoided with the use of HDD.
SE 32-9-4	Collector (C)	<0.01	Disturbance anticipated to be avoided with the use of HDD.
	Access (C)	<0.01	
	Access (O)	0.01	
	Turbine (C)	0.03	
SE 7-10-4	Collector (C)	0.06	Disturbance anticipated to be avoided with the use of HDD.
	Access (C)	0.11	
	Access (O)	0.07	
SW 15-10-5	Collector (C)	0.07	Collector is anticipated to be ploughed in within the existing road ditch. Where this is not feasible, disturbance anticipated to be avoided with the use of HDD.



SW 18-10-4	Access (C)	0.01	Balancing competing constraints.
	Existing Access (O)	0.02	
SW 4-10-4	Collector (C)	0.05	Disturbance anticipated to be avoided with the use of HDD.

Notes

- 1 C = Construction Disturbance, O = Operational Disturbance.
- 2 Some numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.

4.3.2.2 Listed Plant Species

Neither the Approved Project Area nor the Amended Layout Project Area are located within the Endangered and Threatened Plant Range (Government of Alberta 2022c). A search of the Alberta Conservation Information Management System (ACIMS) in September 2022 did not identify any element occurrences of listed plants within the Amended Layout Project Area (AEP 2022).

Vegetation surveys completed between June 15 and 22, 2009 identified field grape fern (*Botrychium campestre*) in SW 35-9-5 W4M (Golder 2010), within the Amended Layout Project Area. Two plants were identified within a Kentucky bluegrass (*Poa pratensis*) dominated grassland with patches of snowberry (*Symphoricarpos occidentalis*), growing within a mat of pussytoes (*Antennaria* sp.) and clover (*Trifolium* sp.; Golder 2010). Field grape fern is presently tracked in Alberta with a provincial ranking of S3 (Vulnerable; AEP 2022), but is not federally listed under the *Species at Risk Act* (SARA) or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; Government of Canada 2022).

The EIS originally concluded that development within native pasture has the potential to result in adverse effects on listed plant species or tracked plant communities (Golder 2010). Although specific location information for the field grape fern population in SW 35 is not available, all infrastructure within SW 35 has been sited on chronically disturbed cultivated lands and as such this population is expected to be avoided. As the Amended Layout has removed all turbines from native pasture and reduced construction disturbance by 33%, the potential for adverse effects on listed plant species are expected to be less than was predicted for the Approved Layout (i.e., Low).

4.3.2.3 Environmentally Sensitive Areas

Alberta Environmentally Significant Areas (ESAs) were updated in 2014, after the publication of the Project EIS (Golder 2010). ESAs are defined as areas that are important to the long-term maintenance of biological diversity, physical landscape features and/ or other natural processes based on a weighted composite of four criteria: areas that contain focal species, species groups or their habitats; areas that contain rare, unique, or focal habitat; areas with ecological integrity; and areas that contribute to water quality and quantity. After summing the values of all four criteria, a cut-off value of >0.189 designates quarter sections as ESAs in the province (Fiera Biological Consulting 2014). ESAs do not necessarily require or confer legal protection; rather, they are used as an information tool to support municipal, regional, and provincial scale planning initiatives (AEP 2022b).



In comparison to the Approved Layout, where 21 quarter sections within the Project Area were defined as ESAs, only 6 quarter sections within the Amended Layout Project Area are defined as ESAs (a 71% decrease). Of the six ESA quarter sections within the Amended Layout Project Area, only three (SE 35-9-5, NW 36-9-5, NE 09-10-5) have Project infrastructure sited within them (50%; Table 12), in comparison to the Approved Layout where 14 of 21 ESAs (67%) had Project infrastructure sited within them.

All three, quarter sections identified as ESAs encountered by the Amended Layout have been characterized as ESAs predominantly due to perceived ‘ecological integrity’ and contributions to water quantity and quality. All disturbance to NW 36-9-5 and NE 09-10-5 is anticipated to be temporary (i.e., underground collector lines, temporary intersection improvements), and will be reclaimed upon completion of construction. In SE-35-9-5, all Amended Layout infrastructure has been sited on existing disturbance (i.e., cultivation, farmyard), and wetlands and native pasture have been avoided.

Table 12. Environmentally Significant Areas located within the Amended Layout Project Area.

Legal Land Location (W4M)	Criterion 1 Focal Species or their Habitats	Criterion 2 Rare, Unique or Focal Habitat	Criterion 3 Ecological Integrity	Criterion 4 Water Quantity and Quality	ESA Sum	Amended Layout Infrastructure Present?
SE-35-9-5	0	0	0.1405	0.0699	0.2104	Yes; infrastructure sited only on existing disturbance (cultivation)
NE 20-9-4	0.002	0	0.133	0.0801	0.2151	No
SE 01-10-5	0.01	0	0.058	0.15	0.218	No
NW 36-9-5	0	0	0.133	0.0801	0.2131	Yes; all disturbance anticipated to be temporary (during construction only)
SW 05-10-4	0.012	0.002	0.1275	0.09	0.2315	No
NE 09-10-5	0	0	0.0905	0.1302	0.2207	Yes; all disturbance anticipated to be temporary (during construction only)

4.3.3 MITIGATION MEASURES

Mitigation measures to reduce potential adverse effects of the Amended Layout on vegetation species and communities have been previously summarized in past Project submissions (Golder 2010, 2016, NaturEner 2019). The mitigation measures included in these past Project submissions have been evaluated in the context of the Amended Layout, and the following mitigation measures will be applied to the Project:

- Infrastructure siting in native pasture has been avoided to the extent feasible. Where infrastructure (i.e., access roads, collectors, temporary workspace for turbine A6) have been sited in native pasture, the proposed footprint has been limited to the extent practical.
- Existing disturbance corridors were followed to the extent practical.
- Access roads will be partially reclaimed following construction (i.e., areas not required for operations).



- Pre-development surveys were completed to identify sensitive areas for avoidance.
- Construction will occur on cleared work areas.
- Topsoil will be stripped and salvaged for use during reclamation.
- Weed surveys will be conducted and outbreaks resulting from the Project will be addressed proactively.
- Reclamation of the Amended Layout will follow the process outlined in previous submissions (Golder 2010, 2016, NaturEner 2019), except that the methods proposed for construction on native pasture are no longer applicable – areas of native pasture are anticipated to be temporarily disturbed by minimal disturbance, plough-in of portions of the collector lines. In the unlikely event that site-specific seeding is required, only certified native seed mixes would be used, in consultation with the landowner.
- The Project footprint will be regularly monitored for weed infestations during operation, and plant species designated as prohibited noxious or noxious (Government of Alberta 2008) that are observed to be present as a result of Project activities will be eliminated or controlled. Control techniques will reflect site conditions and the nature of infestation, and could include a combination of hand pulling, mowing and spot spraying with appropriate herbicides

As there are no turbines sited on native pasture, and the construction and operational disturbance to native pasture has been reduced, compensation for adverse residual effects on native pasture is no longer anticipated to be required for the Amended Layout. As such, Wild Rose 2 will not be employing the *Wild Rose 2 Wind Power Project Native Pasture Mitigation Plan*. In addition, given that the Project is not located within the Endangered and Threatened Plant Range (Government of Alberta 2022c), no known occurrences of listed plants are anticipated to be disturbed by the Amended Layout, and the majority of disturbance to native pasture has been avoided, pre-construction surveys for listed plants are not planned to be undertaken.

4.3.4 RESIDUAL EFFECTS

Given the implementation of these mitigation measures and the reduction in disturbance to native pasture, the likely residual adverse effects of the Amended Layout on vegetation species and communities are predicted to be Low (i.e., the same as predicted for the Approved Layout).

4.4 WILDLIFE SPECIES AND HABITAT

4.4.1 BASELINE UPDATE

In accordance with the Directive (Government of Alberta 2018a), NaturEner completed environmental studies in this area since 2007 (Golder 2010, 2016, 2021; NaturEner 2019), and Wild Rose 2 has continued to conduct environmental studies since acquiring the Project (Figure 3). All wildlife surveys completed to date appropriately and adequately define wildlife and wildlife sensitivities, and all data have informed the changes



proposed in this EE Amendment. It is noted that the Amended Layout has all turbines located on cultivated land and tame pasture, with appropriate setbacks to wildlife and wildlife habitat features.

Wildlife surveys have been conducted within the Wildlife Study Area (i.e., 1,000 m setback of the Amended Layout) since 2007 up to and including 2022, and the most recent surveys relevant to the Amended Layout are summarized in subsequent sections, as appropriate. For the purposes of this amendment, activity setbacks for all new and historical sensitive wildlife features have been retained.

4.4.1.1 Spring and Fall Migration

Spring and Fall migration bird surveys were last conducted in 2015 to support the Approved Project (Golder 2016). The 2022 spring migration surveys were completed by a qualified wildlife biologist following the Bird Migration Survey Protocol (AEP 2020c), and regionally represent the entire Amended Layout Wildlife Study Area. Each point count plot was surveyed twice (one morning survey, one afternoon/evening survey) within the three spring periods (early spring, March 1 to April 15; mid spring, April 1 to April 30; and, late spring, April 15 to May 15) for a total of six visits to each point count plot. Stopover counts were also surveyed during the three spring periods for a total of three visits. Both the point count and stopover plots were surveyed for approximately 20 minutes per visit. (Appendix B). Results of the surveys are included in Tables 13 and 14.

Updates to fall migration surveys are scheduled to occur in fall 2022 in accordance with the Directive (Government of Alberta 2018b).

Table 13. 2022 Spring Migratory Bird Survey Observations and Survey Effort.

Survey Type	Number of Plots	Total Surveys Completed	Total Survey Time (Minutes)	Total Number of Bird Observations ¹	Summary (Observations/Minute)
Point Counts	6	36	745	434	0.58
Stopover Counts	2	6	121	99	0.82

¹ Total number of bird observations within 800 m radius. All birds observed outside of the 800 m plot radius, and birds observed while travelling between plots, were recorded as incidental observations.



Table 14. 2022 Spring Migratory Bird Abundance and Flocks by Species and Guild¹

Common Name	Scientific Name	Number of Individuals ²	Number of Flocks ³
Passerines			
American Robin	<i>Turdus migratorius</i>	43	3
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	105	8
Brown-headed Cowbird	<i>Molothrus ater</i>	7	1
Clay-coloured Sparrow	<i>Spizella pallida</i>	3	0
Common Grackle	<i>Quiscalus quiscula</i>	8	1
European Starling	<i>Sturnus vulgaris</i>	3	1
Gray Catbird	<i>Dumetella carolinensis</i>	1	0
Horned Lark	<i>Eremophila alpestris</i>	45	1
Lincoln's Sparrow	<i>Melospiza lincolni</i>	1	0
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	15	2
Savannah Sparrow	<i>Passerculus sandwichensis</i>	9	1
Song Sparrow	<i>Melospiza melodia</i>	5	1
Tree Swallow	<i>Tachycineta bicolor</i>	4	0
Vesper Sparrow	<i>Poocetes gramineus</i>	8	0
Western Meadowlark	<i>Sturnella neglecta</i>	53	0
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	1	0
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	1	0
Birds of Prey			
Ferruginous Hawk	<i>Buteo regalis</i>	5	0
Merlin	<i>Falco columbarius</i>	1	0
Northern Harrier	<i>Circus hudsonius</i>	5	0
Red-tailed Hawk	<i>Buteo jamaicensis</i>	6	0
Rough-legged Hawk	<i>Buteo lagopus</i>	1	0
Swainson's Hawk	<i>Buteo swainsoni</i>	12	0
Unknown	-	3	0
Grouse and Allies			
Ring-necked Pheasant	<i>Phasianus colchicus</i>	1	0
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	4	0
Waterfowl			
Canadian Goose	<i>Branta canadensis</i>	34	9
Gadwall	<i>Mareca strepera</i>	6	0
Lesser Scaup	<i>Aythya affinis</i>	4	1
Mallard	<i>Anas platyrhynchos</i>	66	10
Northern Pintail	<i>Anas acuta</i>	8	1
Northern Shoveler	<i>Spatula clypeata</i>	4	0
Unknown	-	1	1
Shorebirds/Waterbirds			



Common Name	Scientific Name	Number of Individuals ²	Number of Flocks ³
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	12	3
Killdeer	<i>Charadrius vociferus</i>	15	2
Long-billed Curlew	<i>Numenius americanus</i>	2	0
Ring-billed Gull	<i>Larus delawarensis</i>	8	1
Willet	<i>Tringa semipalmata</i>	2	0
Wilson's Snipe	<i>Gallinago delicata</i>	2	0
Others (crow/pigeon)			
American Crow	<i>Corvus brachyrhynchos</i>	5	0
Black-billed Magpie	<i>Pica hudsonia</i>	7	0
Common Raven	<i>Corvus corax</i>	3	0
Mourning Dove	<i>Zenaidura macroura</i>	3	0

Notes:

- 1 Bird guilds are loose categorizations based on behaviour and taxonomy of the birds
- 2 Total number of bird observations within 800 m radius. All birds observed outside of the 800 m plot radius, and birds observed while travelling between plots, were recorded as incidental observations.
- 3 Flocks are defined as a group of greater than 2 bird of the same species gathered or moving together.

4.4.1.2 Breeding Birds

Breeding Bird Surveys (BBS) were conducted within the Amended Layout in 2016, 2021 and 2022 by qualified wildlife biologists following the Directive (Government of Alberta 2018a) and the *Sensitive Species Inventory Guidelines* for grassland birds (Government of Alberta 2013b) (Appendix B, Figure B1b). Breeding Bird Surveys (BBS) were conducted at 48 survey plots in and around the Amended Layout Wildlife Study Area from June 4 - 8, and June 24 – 26, 2016 (NaturEner 2019). BBS were conducted from May 29 to June 1, and June 19 to 21, 2021 at 36-point count plots distributed within the Amended Layout Wildlife Study Area (Golder 2021; Appendix C), and on May 27 and 29 and on June 22, 2022, at 10 point count plots within SE 35-09-05-W4M, and E 36-09-05-W4M (Appendix B, Figure B1b). Results of the 2016, 2021 and 2022 BBS surveys are summarized in Table 15.

Eight species of provincial conservation concern were observed in 2016, 2021, and 2022 (see bold entries in Table 15; AEP 2020f). Sprague's Pipit (*Anthus spragueii*) and Common Yellowthroat (*Geothlypis trichas*), both listed with the Provincial General Status of *Sensitive*, were only detected in 2016, and Long-billed Curlew (*Numenius americanus*; Provincial General Status of *May be at Risk*) and Sora (*Porzana carolina*; Provincial General Status of *Sensitive*) were only observed in 2021. Barn Swallow (*Riparia riparia*; Provincial General Status of *May be at Risk*) and Bobolink (*Dolichonyx oryzivorus*; Provincial General Status of *Sensitive*) were observed in 2016 and 2021, whereas as Bank Swallow (*Hirundo rustica*; Provincial General Status of *Sensitive*) were observed in both 2016 and 2022. Eastern Kingbird (*Tyrannus tyrannus*; Provincial General Status of *Sensitive*) was detected in all three years.



Table 15. 2016, 2021, and 2022 Breeding Bird Surveys: Observations by Species.

Common Name	Scientific Name	Provincial General Status ¹	Number of Individuals 2016 ²	Number of Individuals 2021 ³	Number of Individuals 2022
American Coot	<i>Fulica americana</i>	Secure	0	1	0
American Avocet	<i>Recurvirostra americana</i>	Secure	0	0	1
American Robin	<i>Turdus migratorius</i>	Secure	14	10	5
American Wigeon	<i>Mareca americana</i>	Secure	0	0	2
Bank Swallow	<i>Riparia riparia</i>	Sensitive	4	0	3
Barn Swallow	<i>Hirundo rustica</i>	May Be at Risk	8	6	0
Black-billed Magpie	<i>Pica hudsonia</i>	Secure	0	1	1
Blue-winged Teal	<i>Spatula discors</i>	Secure	0	0	7
Bobolink	<i>Dolichonyx oryzivorus</i>	Sensitive	2	4	0
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	Secure	59	22	19
Brown-headed Cowbird	<i>Molothrus ater</i>	Secure	0	18	7
Brown Thrasher	<i>Toxostoma rufum</i>	Secure	1	0	0
California Gull	<i>Larus californicus</i>	Secure	0	1	0
Chipping Sparrow	<i>Spizella passerina</i>	Secure	1	0	0
Clay-coloured Sparrow	<i>Spizella pallida</i>	Secure	93	15	19
Common Raven	<i>Corvus corax</i>	Secure	0	0	0
Common Yellowthroat	<i>Geothlypis trichas</i>	Sensitive	2	0	0
Eastern Kingbird	<i>Tyrannus</i>	Sensitive	8	6	3
European Starling	<i>Sturnus Vulgaris</i>	Exotic/ Alien	0	0	2
Franklin's Gull	<i>Leucophaeus pipixcan</i>	Secure	0	12	0
Gadwall	<i>Mareca strepera</i>	Secure	0	0	3
Gray Partridge	<i>Perdix perdix</i>	Exotic/ Alien	0	2	23
Horned Lark	<i>Eremophila alpestris</i>	Secure	31	67	4
House Wren	<i>Troglodytes aedon</i>	Secure	3	0	0
Killdeer	<i>Charadrius vociferus</i>	Secure	0	1	4
Lapland Longspur	<i>Calcarius lapponicus C</i>	Secure	0	2	0
Lesser Scaup	<i>Aythya affinis</i>	Secure	0	4	1
Long-billed Curlew	<i>Numenius americanus</i>	May Be at Risk	0	4	0
Mallard	<i>Anas platyrhynchos</i>	Secure	0	11	3
Marbled Godwit	<i>Limosa fedoa</i>	Secure	0	5	0
Mourning Dove	<i>Zenaidura macroura</i>	Secure	2	0	0
Northern Harrier	<i>Circus hudsonius</i>	Secure	0	3	0
Northern Shoveler	<i>Spatula clypeata</i>	Secure	0	3	2
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Secure	0	0	8
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Secure	29	32	32
Ring-billed Gull	<i>Larus delawarensis</i>	Secure	0	2	0



Common Name	Scientific Name	Provincial General Status ¹	Number of Individuals 2016 ²	Number of Individuals 2021 ³	Number of Individuals 2022
Ring-necked Duck	<i>Aythya collaris</i>	Secure	0	0	4
Ring-necked Pheasant	<i>Phasianus colchicus</i>	Exotic/ Alien	0	2	0
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Secure	133	12	3
Sora	<i>Porzana carolina</i>	Sensitive	0	1	0
Sprague's Pipit	<i>Anthus spragueii</i>	Sensitive	4	0	0
Tree Swallow	<i>Tachycineta bicolor</i>	Secure	13	5	0
Vesper Sparrow	<i>Poocetes gramineus</i>	Secure	34	26	12
Western Kingbird	<i>Tyrannus verticalis</i>	Secure	0	3	0
Western Meadowlark	<i>Sturnella neglecta</i>	Secure	123	29	33
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Secure	1	0	0
Willet	<i>Tringa semipalmata</i>	Secure	0	3	4
Wilson's Phalarope	<i>Phalaropus tricolor</i>	Secure	0	3	0
Wilson's Snipe	<i>Gallinago delicata</i>	Secure	0	3	2
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	Secure	0	4	1
Yellow Warbler	<i>Setophaga petechia</i>	Secure	2	0	0

Notes

- 1 Alberta Wild Species 2020 Status (AEP 2020d).
- 2 2016 data is originally reported in the NaturEner Wild Rose 2 Renewable Energy Project Submission to Alberta Environment and Parks. 1778550-3300–3302. Prepared for NaturEner Energy Canada Inc. (NaturEner 2019).
- 3 2021 data is originally reported in the NaturEner Wild Rose 2: 2021 Technical Report: Sharp-tailed Grouse, Raptor, Breeding Bird, Burrowing Owl, and Snake Surveys (Golder 2021).



4.4.1.3 Bats

Acoustic bat surveys were conducted during the spring and fall of 2018 (NaturEner 2019; Appendix B, Figure). Survey protocols followed accepted bat survey protocols (Lausen et al. 2010) and met the requirements of Standard 100.2.2 of the Directive (Government of Alberta 2018b). Seasonal bat activity is summarized in Table 16.

Table 16. Seasonal Bat Activity in 2019

Season	Survey Period	Bat passes per detector night	Migratory bat passes per night
Spring 2018	May 1 to June 1, 2018	0.49	0.42
Fall 2018	July 14 to October 16, 2018	1.20	0.92

4.4.1.4 Burrowing Owl

Burrowing Owl (*Athene cunicularia*) surveys targeting suitable nesting habitat (i.e., tame and native pasture) were conducted on May 23-26 and June 5, 2019 (NaturEner 2019); June 19 and 21, 2021 (Golder 2021; Appendix C); and on May 27 and June 22, 2022 within suitable nesting habitat (i.e., tame and native pasture) in and around the Amended Layout Wildlife Study Area as per Standard 100.2.4 of the Directive (Government of Alberta 2018b), and the protocol outlined in the *Sensitive Species Inventory Guidelines* (Government of Alberta 2013b). Survey locations from all three years are shown in Appendix B, Figure B1c).

No Burrowing Owl nest burrows, sign or individuals were observed during the 2019 (NaturEner 2019), 2021 (Golder 2021), or 2022 surveys, or incidentally during other wildlife surveys completed for the Project.

Over 50% of the habitat and land use within the Amended Layout Project Area is cultivated which provides low quality nest burrow habitat and hunting/foraging opportunities for Burrowing Owls. As such, the potential for active nest burrows within the Amended Layout Project Area is expected to be low.

4.4.1.5 Sensitive Snakes

Snake hibernacula surveys were conducted on April 25, May 23-25, and on June 5, 2019 (NaturEner 2019), May 29, June 1 and 4, 2021 (Golder 2021; Appendix C); and on May 11 and May 29, 2022 (Appendix B, Figure B1d) within potentially suitable habitat throughout the Amended Layout Wildlife Study Area. All surveys followed the protocol outlined in the *Sensitive Species Inventory Guidelines* (Government of Alberta 2013b).

No snake hibernacula or individual snakes were observed during the hibernacula surveys completed in 2019 (NaturEner 2019), 2021 (Golder 2021) or 2022.



4.4.1.6 Sharp-tailed Grouse

Sharp-tailed Grouse (*Tympanuchus phasianellus*) lek surveys were conducted from April 22-26, 2017; April 24-26, 2019 (NaturEner 2019); April 12-17, 2021 (Golder 2021; Appendix C), and May 7-8 and May 10-11, 2022 (Appendix B, Figure B1d). Surveys were completed at historical lek locations, and in suitable habitat (i.e., native and tame pasture) in and around the Amended Layout Project Area as per Standard 100.2.4 of the Directive (Government of Alberta 2018b) and the protocol outlined in the *Sensitive Species Inventory Guidelines* (Government of Alberta 2013b).

In 2019, eight active Sharp-tailed Grouse leks were identified (NaturEner 2019; Table 18; Figure 3). No active leks were observed in 2021 during the Sharp-tailed Grouse lek surveys or were identified incidentally during other wildlife surveys for the Project (Golder 2021). Sharp-tailed Grouse were observed at two lek sites and incidentally at three plots in 2021 but no lekking evidence was observed at any survey plot. In 2022, one lek (STGR50) was aurally documented (i.e., “booming”) outside the Project Area; the precise location could not be confirmed due to the lack of land access permission. STGR50 was judged to be at least 505 m southwest of the rotor swept area of turbine T34 (Figure 3). A 500 m buffer on historical and unconfirmed lek locations has been retained for precautionary purposes (Figure 3).

4.4.1.7 Amphibians

No amendments to this Section, as additional amphibian surveys have not been undertaken since 2014 and are not required to be kept current in accordance with the Directive (Government of Alberta 2018b). Refer to Section 5.1.6 of the 2016 Environmental Evaluation of Changes Memorandum (Golder 2016).

4.4.1.8 Raptor Nests

Raptor nest surveys were conducted from April 19- 21, and June 6-8, 2016 (NaturEner 2019); April 24-26, May 23-25, and June 3-4, 2019 (NaturEner 2019); April 12-17 and June 19-21 2021 (Golder 2021; Appendix C), and April 7, 26-27, May 11-12, and 29, 2022 as per Standard 100.2.4 of the Directive (Government of Alberta 2018b) and the protocol outlined in the *Sensitive Species Inventory Guidelines* (Government of Alberta 2013b).

Locations and status of raptor nests are shown in Figure 3 and raptor nest observations are summarized in Table 18. Previously identified nests that are no longer present are not included.



4.4.2 POTENTIAL EFFECTS

The following potential effects on wildlife and wildlife habitat (i.e., related to changes to bird and bat mortality, wildlife habitat, and avoidance/reduced reproductive success) are anticipated to result from the construction and operation of the Amended Layout:

- As described in Section 5.3.2, while the Approved Layout sited 11 turbines within native pasture, the Amended Layout has removed all turbines from native pasture. As a result, the Amended Layout has reduced construction disturbance on native pasture by 33% (Table 10). Up to 2.6 ha of native pasture may be disturbed by the construction footprint, and only 0.2 ha of native pasture is anticipated to remain disturbed by the operational footprint of the Amended Layout (Figure 1; Table 10).
- In comparison to the Approved Layout, the Amended Layout has removed all overhead collectors (a 100% decrease), which is expected to reduce potential adverse effects on birds and bats (e.g., collision, electrocution).
- One wetland within the Amended Layout Project Area has historically supported northern leopard frogs (Wetland 286; NaturEner 2019). Similar to the Approved Layout, no turbines are located within the 100 m setback of the wetland; however, a collector line was routed within the setback (Golder 2016). While an overhead collector line previously passed through the 100 m setback for the Approved Layout, two underground collector lines for the Amended Layout are routed across cultivated cropland and tame pasture to the north and south of this wetland, with a minimum distance of 4.65 m from the edge of the wetland (Figure 3b). These collector lines are expected to be ploughed in, and no direct disturbance to the wetland is expected.
- Similar to the Approved Layout, the construction or operational footprints of the Amended Layout turbines are not located within the recommended activity setback distance of any Sharp-tailed Grouse lek. Short segments of two access routes are located within the setback of historic lek locations STGR10 and STGR13 (Table 17; Figure 3). STGR10 was last observed to be active in 2019, and STGR13 was last observed to be active in 2017, and both of these historic leks are located on the opposite side of an existing Road from the Project components (Table 17).
- Similar to the Approved Layout, the construction or operational footprints of the Amended Layout turbines are not located within the recommended activity setback distance of any raptor nest.
- While portions of the underground collector system and temporary crane path routes of the Approved Layout passed through the activity setbacks of five raptor nests (Golder 2016), underground collectors from the Amended Layout pass through the activity setback of only one raptor nest (GHOW01). Great-horned Owl nest GHOW01 was identified within a tree adjacent to Township Road 102 during 2022 surveys. A total of 1.96 ha of temporary construction disturbance from temporary collector line installation is anticipated to occur within the 100 m setback from this nest (Figure 3; Table 18). The collector line installation is



planned to occur within the roadside ditch of Township Road 102 using plough-in methods to reduce disturbance.

- Portions of access for the Approved Layout passed through the activity setbacks of two raptor nests (Golder 2016). Similarly, Portions of the Amended Layout pass through the activity setback of two raptor nests (RN40 and RN60). Disturbance from construction (0.50 ha) and operation (0.26 ha) of the Amended Layout access is anticipated to be located within the setback of Raptor nest RN40, with a nearest distance of 904 m from the nest (Figure 3; Table 18). Similarly, 1.42 ha of construction disturbance and 1.32 ha of operational disturbance from the access to Turbines A1 and A2 is anticipated to be located within the setback of Raptor nest RN60, along with 0.93 ha of temporary construction disturbance from collector line installation. The access route to Turbines A1 and A2 has a nearest distance of 434 m from the nest (Figure 3; Table 18).

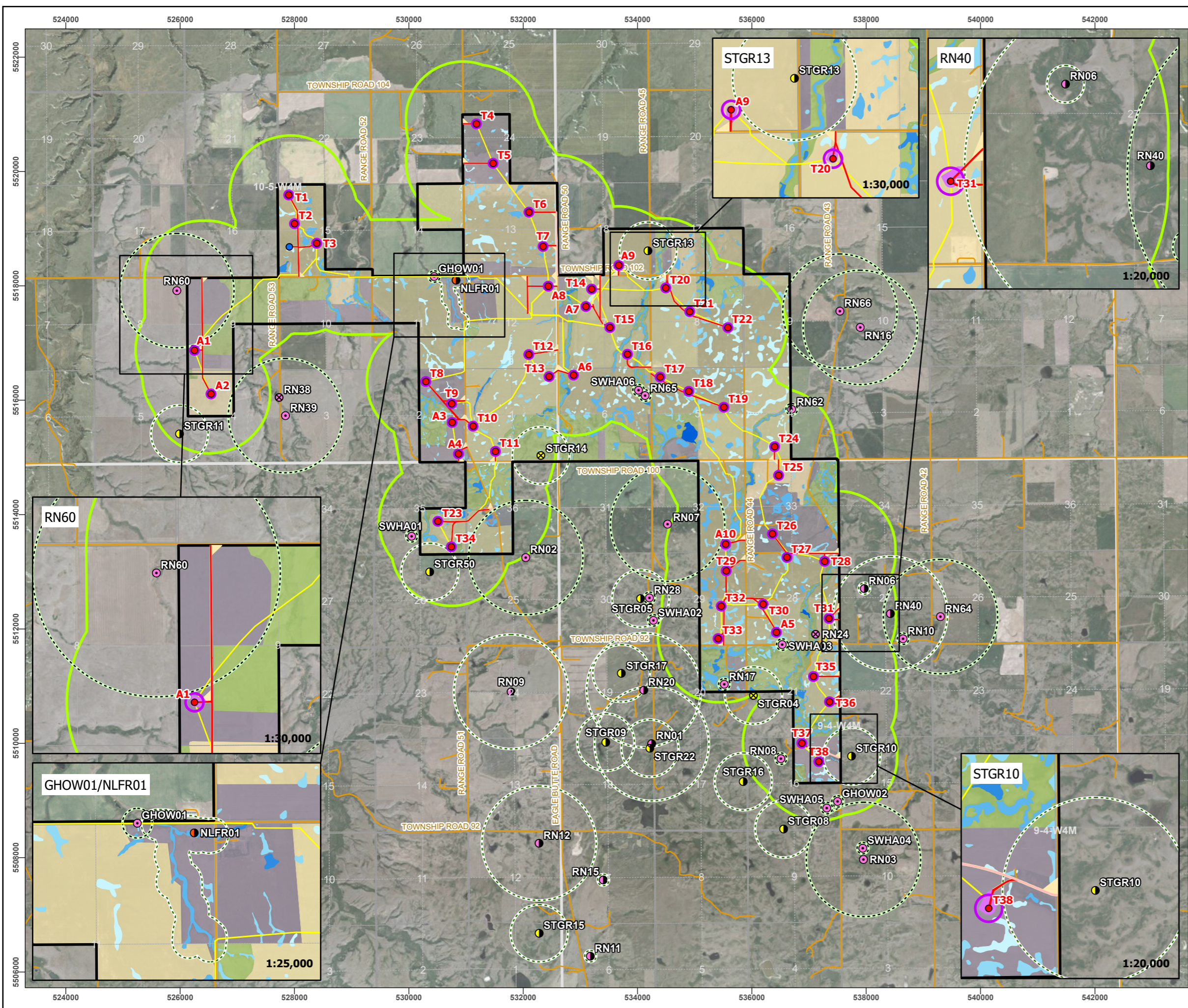
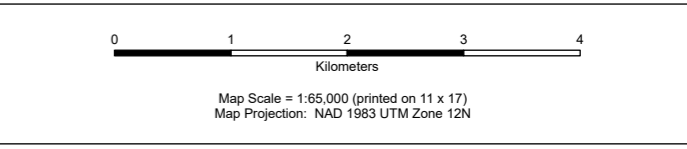
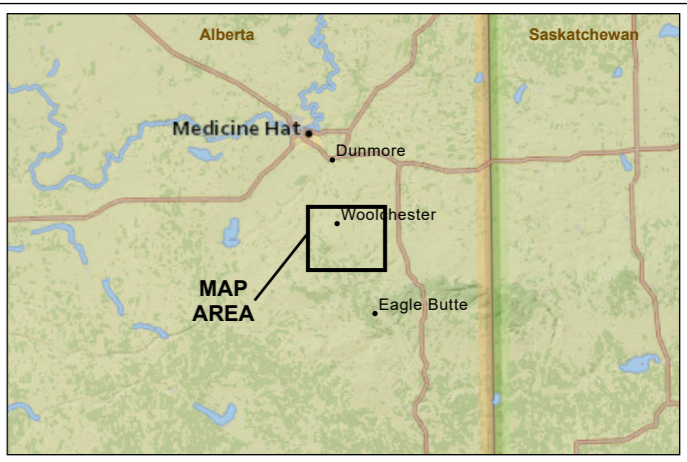


Figure 3. Wildlife Habitat Features and Associated Setbacks

Wild Rose 2 Wind LP

Legend

Wildlife Habitat Feature	Wildlife Status	Project Infrastructure	Land Cover	Laydown Area
Amphibian Breeding Pond	Active	MET Tower	Cultivated	Amended Layout Project Area
Lek	Inactive	Turbine Location	Farm Yard	Wildlife Study Area
Stick Nest	Unconfirmed	Turbine Swept Area	Native Grassland	Local Road
	Precautionary Setback	Access - Existing	Road	Township
	Restricted Activity	Access - Operational Disturbance	Tame Pasture	Section
		Collector Line - Construction	Trail or Unimproved Road	Quarter Section
		Disturbance	Wetland - Class I	
		Access - Construction Disturbance	Wetland - Class II	
		Turbine - Construction Disturbance	Wetland - Class III	
			Wetland - Class IV	
			Wetland - Class V	



Data Sources

- Project Data. September 14, 2022. Wild Rose 2 Wind LP.
- Land Cover data. January 21, May 20, and September 13, 2022. Golder Associates Ltd. and EDI Environmental Dynamics Inc.
- Wetland Data. December 12, 2021 and September 14, 2022. EDI Environmental Dynamics Inc.
- Inset Basemap. National Geographic World Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Main Basemap. World Imagery: Cypress County, Earthstar Geographics
- Main Basemap. World Imagery: Cypress County, Maxar

Disclaimer
EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data has been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

Drawn: C. Tennant / O. Leblanc	Checked: J. Muir / S. Skinner	Figure 3	Date: 2022-10-14
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Table 17. Historical Sharp-tailed Grouse lek locations and proximity to Project infrastructure.

Sharp-tailed Grouse Lek ID	Location of Lek (UTM Zone 13U NAD 83)		Is the Required Setback Met (Y/N)	Distance from Nest to Nearest Project Related Disturbance (metres)	2019 Status	2021 Status	2022 Status	Comments
	Easting (m)	Northing (m)						
STGR04	536028	5510837	Y	1,022	Active	Inactive	Unconfirmed	
STGR05	534054	5512531	Y	1,343	Active	Unconfirmed	Unconfirmed	
STGR08	536557	5508502	Y	1,255	Active	Unconfirmed	Unconfirmed	
STGR09	533446	5510018	Y	2,600	Active	Unconfirmed	Unconfirmed	
STGR10	537745	5509776	N	205	Active	Inactive	Unconfirmed	0.66 ha of construction access disturbance and 0.51 ha of operational access disturbance (0.36 ha of existing access) located within setback, lek located on opposite side of Range Road 43 from the Project component. Inactive in 2021, active in 2019, 2017, and 2016.
STGR11	525990	5515412	Y	816	Unconfirmed	Unconfirmed	Unconfirmed	
STGR13	534184	5518614	N	499	Inactive	Inactive	Unconfirmed	0.38 ha of construction access disturbance located within setback, lek located on opposite side of Township Road 102 from the Project component. No operational disturbance anticipated within this setback. Inactive in 2021 and 2019, active in 2017 and 2016.
STGR14	532310	5515034	Y	727	Inactive	Inactive	Inactive	
STGR15	532281	5506679	Y	5,597	Unconfirmed	Unconfirmed	Unconfirmed	
STGR16	535850	5509331	Y	1,152	Active	Unconfirmed	Unconfirmed	
STGR17	533718	5511225	Y	1,724	Active	Unconfirmed	Unconfirmed	
STGR22	534217	5509914	Y	2,165	Active	Unconfirmed	Unconfirmed	
STGR50	530378	5513011	Y	505	N/A	N/A	Unconfirmed	



Table 18. Raptor nests, associated activity setback distances, and distances to nearest wind farm infrastructure.

Common Name	Scientific Name	Nest ID	Status	Location of Nest (UTM Zone 13U NAD 83)		Legal Location (W4M)	Required Activity Setback Distance (m)	Is the Required Setback Met (Y/N)	Distance from Nest to Nearest Project Related Disturbance (m)
				Easting (m)	Northing (m)				
Ferruginous Hawk	<i>Buteo regalis</i>	RN01	Unconfirmed in 2021/2022	534248	5509994	NE-18-9-4	1000	Y	2,081
Ferruginous Hawk	<i>Buteo regalis</i>	RN02	Confirmed Active in 2022	532045	5513249	NE-25-9-5	1000	Y	1,030
Ferruginous Hawk	<i>Buteo regalis</i>	RN03	Confirmed Active in 2021/2022	537952	5507969	NW-10-9-4	1000	Y	1,808
Swainson's Hawk	<i>Buteo swainsoni</i>	RN06	Unconfirmed in 2021/2022	537967	5512707	NW-27-9-4	100	Y	517
Ferruginous Hawk	<i>Buteo regalis</i>	RN07	Confirmed Active in 2022	534526	5513833	SW-32-9-4	1000	Y	1,001
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	RN08	Confirmed Active in 2021	536508	5509732	NW-16-9-4	100	Y	383
Ferruginous Hawk	<i>Buteo regalis</i>	RN09	Unconfirmed in 2021/2022	531789	5510902	NW-24-9-5	1000	Y	2,670
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	RN10	Confirmed Active in 2021	538644	5511829	SE-27-9-4	100	Y	1,173
Swainson's Hawk	<i>Buteo swainsoni</i>	RN11	Unconfirmed in 2021/2022	533176	5506278	NW-6-9-4	100	Y	5,174
Ferruginous Hawk	<i>Buteo regalis</i>	RN12	Unconfirmed in 2021/2022	532279	5508253	NE-12-9-5	1000	Y	4,673
Swainson's Hawk	<i>Buteo swainsoni</i>	RN15	Unconfirmed in 2021/2022	533401	5507611	SW-7-9-4	100	Y	4,145
Great Horned Owl	<i>Bubo virginianus</i>	RN16	Confirmed Active in 2021	537896	5517274	SW-10-10-4	1000	Y	2,244
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	RN17	Confirmed Active in 2022	535518	5511033	NE-20-9-4	100	Y	685
Ferruginous Hawk	<i>Buteo regalis</i>	RN20	Confirmed Active in 2021; Species unconfirmed; probable FEHA	534110	5510930	NE-19-9-4	1000	Y	1,509
Swainson's Hawk	<i>Buteo swainsoni</i>	RN28	Confirmed Active in 2021	534209	5512544	NE-30-9-4	100	Y	1,190
Ferruginous Hawk	<i>Buteo regalis</i>	RN39	Confirmed Active in 2021	527843	5515731	NW-3-10-5	1000	Y	1,285
Ferruginous Hawk	<i>Buteo regalis</i>	RN40	Unconfirmed in 2021/2022	538424	5512268	SE-27-9-4	1000	N	904 (access - construction)
Ferruginous Hawk	<i>Buteo regalis</i>	RN60	Confirmed Active in 2021/2022	525943	5517917	NE-8-10-5	1000	N	434 (access - construction)
Great Horned Owl	<i>Bubo virginianus</i>	RN62	Confirmed Active in 2021	536696	5515842	NE-4-10-4	100	Y	646
Swainson's Hawk	<i>Buteo swainsoni</i>	RN63	Active in 2021 but blown down in 2022	529354	5517647	NW-11-10-5		N/A	N/A



Common Name	Scientific Name	Nest ID	Status	Location of Nest (UTM Zone 13U NAD 83)		Legal Location (W4M)	Required Activity Setback Distance (m)	Is the Required Setback Met (Y/N)	Distance from Nest to Nearest Project Related Disturbance (m)
				Easting (m)	Northing (m)				
Ferruginous Hawk	<i>Buteo regalis</i>	RN64	Confirmed Active in 2021	539299	5512216	SW-26-9-4	1000	Y	1,780
Swainson's Hawk	<i>Buteo swainsoni</i>	RN65	Confirmed Active in 2021	534133	5516082	NE-6-10-4	100	Y	344
Ferruginous Hawk	<i>Buteo regalis</i>	RN66	Confirmed Active in 2021	537540	5517558	NW-10-10-4	100	Y	1,909
Great Horned Owl	<i>Bubo virginianus</i>	GHOW01	Confirmed Active in 2022	530444	5518164	SE-14-10-5	100	N	~10¹ (collector line – construction)
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA01	Confirmed Active in 2022	530049	5513621	SW-35-9-5	100	Y	456
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA02	Confirmed Active in 2022	534279	5512150	SW-29-9-4	100	Y	1,101
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA03	Confirmed Active in 2022	536531	5511727	SW-28-9-4	100	Y	165
Great Horned Owl	<i>Bubo virginianus</i>	GHOW02	Confirmed Active in 2022	537499	5508984	SE-16-9-4	100	Y	697
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA05	Confirmed Active in 2022	537310	5508868	SE-16-9-4	100	Y	1,625
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA04	Confirmed Active in 2022	537940	5508166	NW-10-9-4	100	Y	751
Swainson's Hawk	<i>Buteo swainsoni</i>	SWHA06	Confirmed Active in 2022	534018	5516176	NE-6-10-4	100	Y	356

Notes: Bold entries indicate Amended Layout infrastructure is located within the applicable setback.

1 Nest is in a tree on private land adjacent to the ditch of Township Road 102.



4.4.3 MITIGATION MEASURES

Mitigation measures to reduce potential adverse effects of the Amended Layout on wildlife species and habitat have been previously summarized in past Project submissions (Golder 2010, 2016, NaturEner 2019). The mitigation measures included in these past Project submissions have been evaluated in the context of the Amended Layout, and the following mitigation measures will be applied to the Project:

- All turbines have been sited off native pasture.
- All overhead collectors have been removed.
- Existing roads and trails were prioritized and used to the extent safely practical.
- The number of waterbody crossings has been reduced to the extent practical, and existing road crossings have been utilized where feasible (e.g., the access to T38).
- Any disturbances to wetlands and/or water bodies that cannot be avoided by the Amended Layout will be addressed appropriately as per the requirements of the *Water Act* and/or the *Alberta Wetland Policy*.
- A pre-construction wildlife clearance survey will be completed for all Project components, as appropriate, to verify the status of all known wildlife habitat features and identify new wildlife habitat features (if present) to inform appropriate mitigation (e.g., activity restriction buffers).
- Activity restriction guidelines for sensitive species were adhered to during the design of the turbine layout, to the extent feasible.
- A site-specific EPP for the construction phase of the Project will be developed, including details related to environmental concerns (e.g., sensitive wildlife and vegetation), and procedures (e.g., salvage of topsoil and control of soil erosion).
- In accordance with the *Conservation and Reclamation Directive for Renewable Energy Operations*, a Pre-Disturbance Site Assessment (PDSA) will be completed for the Amended Layout prior to construction to inform site-specific reclamation.
- Layout components will be surveyed, and all Project construction activity will be restricted to designated work areas and ROWs.
- Concrete work areas will be isolated from waterbodies or wetlands to prevent uncured or partly cured concrete from coming into contact with waterbodies and wetlands.
- Construction will occur as quickly and as safely as possible on or near sensitive areas to limit the potential for disturbance to wildlife and wildlife habitat.
- The collector system will be installed using a combination of HDD and plough-in methods through native pasture and wetlands, or adjacent to sensitive wildlife features at noted locations to reduce the potential for adverse effects on wildlife habitat.
- The Project will comply with the federal *Migratory Birds Convention Act* and the *Alberta Wildlife Act*.
- Work within native pasture will be scheduled to avoid the grassland bird breeding season (April 1 to July 15; Government of Alberta 2018b). When construction within native pasture



is required after July 15, but before the end of the migratory bird nesting period for nesting zone B3 (April 12 to August 23; Government of Canada 2018), a non-intrusive nest survey will be conducted by a qualified wildlife biologist to determine the presence of breeding birds. If active nests (i.e., nest under construction or constructed, with or without eggs present) are found or suspected to be present based on bird behaviour, then each confirmed or suspected nest location will be appropriately buffered.

- Work within tame pasture will be scheduled to avoid the grassland bird breeding season (April 1 to July 15) as the Project schedule allows. Where the Project schedule does not allow this avoidance, mowing will occur in March 2023 prior to the onset of the grassland breeding bird season and re-mowing will occur as appropriate (i.e., reduce the habitat suitability) to support Project activities, with nest surveys conducted by a qualified wildlife biologist. If active nests (i.e., nest under construction or constructed, with or without eggs present) are found or suspected to be present, then mitigation measures (e.g., species-specific setback buffer, on-site monitor) will be designed and implemented, and forwarded to AEP for their review.
- All construction within 1,000 m of a Ferruginous Hawk nest will occur outside of the critical nesting period of March 15 to July 15 (Government of Alberta 2018b).
- Project construction activities will occur outside of the active lekking period from March 15 - June 15 (Government of Alberta 2018b), where they occur within the 500 m setback of historic Sharp-tailed Grouse lek STGR10. At no time during construction or operations will there be Project-related activities on the side of the public roads where these historic leks are located.
- Prior to construction activities occurring within 100 m of all Class III-VI wetlands, a non-intrusive field survey will be conducted by an experienced wildlife biologist to determine the presence of breeding amphibians and, if necessary, appropriate mitigation will be applied to reduce any adverse effects on breeding amphibians as per Appendix A in the Directive. Wild Rose 2 will discuss findings and the need for additional mitigation with AEP so that potential residual effects on amphibians are acceptable. Wild Rose 2 will schedule construction within setbacks or direct disturbances to wetlands with the potential to support amphibian populations outside of the breeding period or will have an experienced wildlife biologist onsite if construction during the breeding period is necessary.
- Prior to Project construction activities occurring within 100 m of all Class III or higher wetlands, a non-intrusive survey will be conducted by an experienced wildlife biologist to determine the potential for the habitat affected by the Project footprint to support hibernating/dormant amphibians. Survey results and proposed mitigation would be provided to AEP for review.
- When construction of infrastructure occurs within the setbacks of wetlands Class III or higher (i.e., during the terrestrial phase of the amphibian lifecycle from July 16 to Sep 30), an experienced wildlife biologist familiar with amphibian species will be on site to monitor wildlife behaviour and to propose on-site mitigation to reduce risk to wildlife (as per Standard 100.3.16 of the Directive; (Government of Alberta 2018a). A speed limit of 30 km/hr will be



established during construction and operations to minimize dust and collision risk for wildlife on Project access.

- Amphibian exclusion fencing will be established along the edge(s) of the construction footprint within 100m of wetlands Class III or higher, as appropriate.
- Where temporary wetland crossings are required, crossings will be conducted during dry or frozen conditions where safe and feasible.
- Erosion and sedimentation controls will be installed where warranted (i.e., within the 100 m buffer of Class III or higher wetlands and waterbodies) to prevent sediment and other material from entering the wetland or waterbody.
- Permanent met towers will be free standing to the extent practicable. Should guy wires on the met towers be required, they will be equipped with markers specifically designated to reduce the potential for bird collision.
- Environmentally sensitive features (e.g., nests) or their associated setback will be clearly marked prior to the start of construction.
- Where avoidance of environmentally sensitive features or their associated setbacks was not possible during Project design, a resource specialist (e.g., experienced wildlife biologist) will be present on-site, as required, to assess the features and to inspect or monitor construction activities at or near sensitive areas.
- A member of the onsite construction staff will be trained in protocols to respond to, and report environmental and wildlife issues identified onsite.
- During construction in environmentally sensitive areas (e.g., within setbacks), an Environmental Inspector, or equivalent, may be on-site to guide implementation, monitor and report on the effectiveness of the mitigation measures, as appropriate.
- In accordance with the Directive (Government of Alberta 2018a), site-specific wildlife surveys will be kept current until the Project is commissioned, to identify nesting/breeding areas, and appropriate mitigation will be applied.
- Project personnel will be required to report wildlife issues, incidents with wildlife, nuisance wildlife, injured or dead wildlife as soon as it is safe to do so to the on-site Project Manager, who will determine in collaboration with Wild Rose 2's environmental representative corrective and/or emergency action to be taken in the field and what regulatory reporting is required. In the event that an injured or dead species listed provincially (AEP 2020d) and/or federally (Government of Canada 2022) is observed on-site, Wild Rose 2 will promptly notify the local AEP Wildlife Biologist.
- The Project will adhere to the existing Snake Protection Plan (Golder 2020) prepared for the 2020 Layout.
- Washing, re-fueling or equipment maintenance activities will not occur within 100 m of a waterbody or within native pasture.
- Project personnel will be prohibited from carrying firearms and being accompanied by domestic animals. An exception applies to the potential use of trained dogs during mortality searches.



- Wild Rose 2 will install fences or gates at inactive access crossings located within 100 m of publicly accessible roads, where permitted by landowners or the appropriate regulatory agency.
- Lighting for on-the-ground Project infrastructure will use down-shielded lamps controlled by proximity sensors where feasible.

4.4.4 RESIDUAL EFFECTS

Given the implementation of these mitigation measures and the reduction in disturbance to native pasture, the likely residual adverse effects of the Amended Layout on wildlife and wildlife habitat are predicted to be of Low magnitude and minimal predicted level of importance (i.e., the same as predicted for the Approved Layout).

5 POST-CONSTRUCTION MONITORING AND MITIGATION

Post-construction surveys will be completed as directed by the *Post-Construction Survey Protocols for Wind and Solar Energy Projects* (AEP 2020c), and the *Conservation and Reclamation Directive for Renewable Energy Operations* (Government of Alberta 2018a).

6 SUMMARY

The Amended Layout reviewed herein reduces the number of turbines needed for the Project from 60 to 48; a reduction of 12 turbines (i.e., a 20% reduction) and associated infrastructure (Figure 1). As a result of the reduced number of turbines, the area of construction disturbance for the Amended Layout has been reduced by 33%, and the area of disturbance during operations reduced by 24%.

The Amended Layout will be constructed as previously described for the Approved Layout, with the following exceptions:

- no overhead collectors are planned; all collectors will be underground;
- a 7.0 ha laydown area will be located on cultivated land at the north-east corner of NE 12-10-5 W4M, and the operations and maintenance building will be constructed within the laydown area; and,
- a permanent meteorological tower is planned to be installed in SW 15-10-5 W4M.

The mitigation strategies and commitments presented in this EE Amendment align with the mitigations proposed in the Original EIS and subsequent Evaluation of Changes memoranda but have been reduced due to the large-scale reductions of turbines and reducing the potential for adverse effects on sensitive habitat, as noted above. This is further reflected in the full removal of turbines sited on native pasture in the Amended Layout, and the construction disturbance to native pasture has been reduced 33%.



Table 19. Summary of Changes to Likely Residual Adverse Effects and Comparison Between the Approved and the Amended Layout

Valued Ecosystem Component	Predicted Level of Adverse Effect		Changes to Residual Effects
	Approved Layout	Amended Layout	
Terrain and Soils	Low: 34 turbines on cultivated cropland, 15 turbines located on tame pasture, 11 turbines located on native pasture	Low: 38 turbines on cultivated cropland, 10 turbines located on tame pasture	Not Significant <ul style="list-style-type: none">Reduced adverse effect due to less soil being disturbed for construction and operation of the Amended LayoutDecrease of operational footprint from 21.3 ha for the Approved Layout to 16.2 ha for the Amended Layout (23% decrease).
Wetlands, Water Bodies, and Hydrology	Low: 11 instances where Project infrastructure (i.e., temporary crane path or underground collector system) cross a portion of a Class III or higher wetland.	Low: 1 instance where Project infrastructure (i.e., underground collector system) crosses a portion of a Class III or higher wetland. 4 instances where an Access Road crosses a Class III wetland.	Not Significant <ul style="list-style-type: none">Fewer crossings of Class III or higher wetlands by the Amended Layout.Four access roads and one underground collector crosses a Class III or higher wetland.Disturbance to 15 Class III or higher wetlands is anticipated to be avoided through Horizontal Directional Drilling.
Vegetation Species and Communities	Low: 11 turbines on native pasture. 84% of the Approved Layout was located on cultivated cropland and tame pasture and 16% was on native pasture to limit habitat disturbance.	Low: No turbines on native pasture. Over 73% of the Amended Layout construction footprint is located on cultivated cropland to limit habitat disturbance.	Not Significant <ul style="list-style-type: none">Reduced adverse effects due to reduced Project disturbance to native pasture.Removal of all turbine locations (100% decrease) on native pastureCompared to the Approved Layout, Amended Layout has a 33% reduction of construction disturbance to native pasture
Wildlife Species and Habitat	Low: 34 turbines on cultivated cropland, 15 turbines located on tame pasture, 11 turbines located on native pasture 11 turbines on native pasture (i.e., potential habitat for listed wildlife species) 8.5 km of overhead collector lines. Project infrastructure set back from sensitive wildlife features to the extent practical.	Low: 38 turbines on cultivated cropland, 10 turbines located on tame pasture No turbines on native pasture (i.e., potential habitat for listed wildlife species) No overhead collector lines. Project infrastructure set back from sensitive wildlife features to the extent practical.	Not Significant <ul style="list-style-type: none">Reduced adverse effect due to less Project disturbance to native pasture.Removal of all turbine locations (100% decrease) on native pasture.Removal of all overhead collector lines (100% decrease).Comparable adverse effect due to decreased number of turbine locations and less associated infrastructure occurring on suitable habitat for listed species (i.e., native pasture).Fewer instances of underground collector lines and access roads overlapping raptor nest activity setbacks.Compared to the Approved Layout, Amended Layout has a 33% reduction of construction disturbance to native pasture

Note: The determination of significance used ecological principles and professional judgement. An effect was considered significant if it resulted in a change to a VEC that alters its status or integrity beyond an acceptable level.



Overall, the majority of the conclusions reached in the EIS (Golder 2010) and previous Evaluation of Changes memoranda (Golder 2016) regarding the likely residual adverse effects of the Project on the VECs remain unchanged for the Amended Layout. Notably:

- Adverse effects are predicted to be reduced for the Terrain and Soils VEC and the Vegetation Species and Communities VEC, primarily due to the removal of all turbines and reduced disturbance to native pasture.
- Adverse effects are predicted to be comparable to those predicted for the Approved Layout for the Wetlands, Surface Water Bodies, and Hydrology VEC due to a reduction in the number of infrastructure crossings of drainages/wetlands, but an increase in the number of wetlands Class III or greater (most of which are chronically disturbed) within 100 m of the Amended Layout.

Adverse effects are predicted to be comparable to those predicted for the Approved Layout for the Wildlife Species and Habitat VEC due to a decrease in disturbance to native pasture, and reduced raptor nest setback infringements.

Table 19 provides a summary of the predicted residual adverse effects of the Amended Layout compared to the predicted residual adverse effects of the Approved Layout for the following VECs: Terrain and Soils; Wetlands, Waterbodies and Hydrology; Vegetation Species and Communities; and Wildlife Species and Habitat. The predicted effects of the Approved Layout on the VECs were predicted to be Not Significant. The predicted effects of the Amended Layout on the VECs are similar, but reduced from those identified for the Approved Layout, and are predicted to be Not Significant.

Considering the updates of the Project, as evaluated in this amendment report, it is EDI's opinion that the Project can be constructed and operated in an environmentally responsible manner, and with reduced effects from those that were previously concluded in the Original EIS and subsequent Evaluation of Changes memoranda.

Yours truly,

EDI Environmental Dynamics Inc.

Submitted Electronically

Jennifer Muir, M.Sc., P.Biol.
Vegetation Ecologist

Daryl Johannesen, M.Sc., P.Biol.
Senior Biologist



7 REFERENCES

- Alberta Biodiversity Monitoring Institute. 2022. ABMI Wetland Inventory – Metadata. . (<https://abmi.ca/home/data-analytics/da-top/da-product-overview/Advanced-Landcover-Prediction-and-Habitat-Assessment--ALPHA--Products/ABMI-Wetland-Inventory.html?scroll=true>)
- Alberta Environment and Parks. 2016. Guide for Assessing Permanence of Wetland Basins. Land Policy Branch, Policy and Planning Division, Edmonton, Alberta. 28 pp.
- Alberta Environment and Parks. 2020a. Alberta Merged Wetland Inventory. (<https://geodiscover.alberta.ca/geoportal/rest/metadata/item/bfa8b3fdf0df4ec19f7f648689237969/html>)
- Alberta Environment and Parks. 2020b. Bird Migration Survey Protocol. 18 pp.
- Alberta Environment and Parks. 2020c. Alberta Wild Species Status List: 2020 Status Listing. Government of Alberta. (<https://extranet.gov.ab.ca/env/wild-species-status/documents/SPECRISK20202015201020052000.xlsx>)
- Alberta Environment and Parks. 2020d. Post-Construction Survey Protocols for Wind and Solar Energy Projects. 40 pp.
- Alberta Environment and Parks. 2022a. Alberta Conservation Information Management System (ACIMS). (<https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/>)
- Alberta Environment and Parks. 2022b. Environmentally Significant Areas Report. (<https://www.albertaparks.ca/albertaparksca/library/environmentally-significant-areas-report/>)
- Alberta Environment and Sustainable Resource Development. 2015. Alberta Wetland Classification System. Water Policy Branch, Policy and Planning Division, Edmonton, Alberta. 54 pp.
- Alberta Utilities Commission. 2021. Rule 007 Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments. 145 pp. (<https://www.auc.ab.ca/Shared%20Documents/rules/Rule007.pdf>)
- AltaLIS Ltd. 2022. Spatial Data. . (<https://www.altalis.com/>)
- Fiera Biological Consulting. 2014. Environmentally Significant Areas in Alberta: 2014 Update. Prepared for the Government of Alberta. 51 pp.
- Golder Associates Ltd. 2010. Wild Rose 2 Wind Power Project: Environmental Impact Statement. 08-1334-0088. Prepared for NaturEner Wild Rose 2 Energy Inc. 98 pp.
- Golder Associates Ltd. 2013. Evaluation of Changes for the Wild Rose 2 Wind Power Project due to a Change in Turbine Supplier and Turbine Layout. Prepared for NaturEner Wild Rose 2 Energy Inc. 31 pp.



- Golder Associates Ltd. 2016. Evaluation of Changes for the Wild Rose 2 Wind Power Project due to a Change in Turbine Model and Turbine Layout. Prepared for NaturEner Wild Rose 2 Energy Inc. 30 pp.
- Golder Associates Ltd. 2020. NaturEner Wild Rose 2 Wind Power Project Snake Protection Plan. Prepared for NaturEner Energy Canada Inc. 10 pp.
- Golder Associates Ltd. 2021. NaturEner Wild Rose 2: 2021 Technical Report: Sharp-tailed Grouse, Raptor, Breeding Bird, Burrowing Owl, and Snake Surveys. Prepared for NaturEner Energy Canada Inc.
- Government of Alberta. 2008. Weed Control Act. W-5.1.
- Government of Alberta. 2013a. Alberta Wetland Policy. 25 pp.
- Government of Alberta. 2013b. Sensitive Species Inventory Guidelines. Government. 128 pp. (<https://open.alberta.ca/publications/sensitive-species-inventory-guidelines>)
- Government of Alberta. 2015. Alberta Wetland Identification and Delineation Directive. Water Policy Branch, Alberta Environment and Parks, Edmonton, Alberta. 55 pp.
- Government of Alberta. 2017. Wildlife Directive for Alberta Wind Energy Projects. AEP Fish and Wildlife 2016 No. 6. 30 pp.
- Government of Alberta. 2018a. Conservation and Reclamation Directive for Renewable Energy Operations. Edmonton, Alberta. 66 pp.
- Government of Alberta. 2018b. Wildlife Directive for Alberta Wind Energy Projects. 30 pp. (<https://open.alberta.ca/publications/wildlife-2016-no-6>)
- Government of Alberta. 2022a. Aerial Photographic Record System. (<https://securexnet.env.gov.ab.ca/aprs/inquiry.jsp>)
- Government of Alberta. 2022b. Alberta Climate Information Service. Interpolated Weather Data Since 1961 for Alberta Townships . (<https://agriculture.alberta.ca/acis/township-data-viewer.jsp>)
- Government of Alberta. 2022c. Wildlife Sensitivity Maps. (<https://www.alberta.ca/wildlife-sensitivity-maps.aspx>)
- Government of Canada. 2018. General Nesting Period of Migratory Birds. (<https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>). Accessed August 12, 2020.
- Government of Canada. 2022. Species at risk public registry. (<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>)
- Lausen, C., Gruver, J., and Baerwald, E.F. 2010. Bats and wind turbines. Pre-siting and preconstruction survey protocols. pp. 14. In Sustainable Resource Development (eds.) Handbook of inventory methods and standard protocols for surveying bats in Alberta, Volume Appendix 5. Sustainable Resource Development, Edmonton, Alberta.



- NaturEner Energy Canada Inc. 2019. NaturEner Wild Rose 2 Renewable Energy Project Submission to Alberta Environment and Parks. 1778550-3300–3302. Prepared for NaturEner Energy Canada Inc. 114 pp.
- Stewart, R.E. and Kantrud, H.A. 1971. Classification of Natural Ponds and Lakes in the Glaciated Prairie Region. Report. Resource Publication 92. Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Washington, D.C. 64 pp. (<http://pubs.er.usgs.gov/publication/rp92>)



APPENDICES



APPENDIX A EVALUATOR QUALIFICATIONS



Appendix Table 1. Evaluator Qualifications

Name	Title	Role	Experience
Jennifer Muir, M.Sc., P.Biol.	Vegetation Ecologist	Lead Author, Project Manager	Jennifer has over ten years of experience in vegetation ecology and has specialized in the inventory and implementation of best practices associated with wetlands and vegetation in western Canada.
Susan Skinner, M.Sc.	Biologist	Contributing Author	Susan has over twenty-five years of avian ecology experience in Alberta and Saskatchewan. She has led environmental baseline, monitoring, and habitat compensation programs in Saskatchewan.
Daryl Johannesen, M.Sc., P.Biol.	Senior Biologist	Senior Review and Oversight	Daryl is a Professional Biologist with over thirty-five years of project experience spanning regions from Newfoundland to British Columbia, and throughout the Northwest Territories. His experience focuses on permitting, licensing and monitoring of energy developments, with a focus on renewable energy in western Canada for the last 23 years.



APPENDIX B WILDLIFE SURVEY LOCATIONS

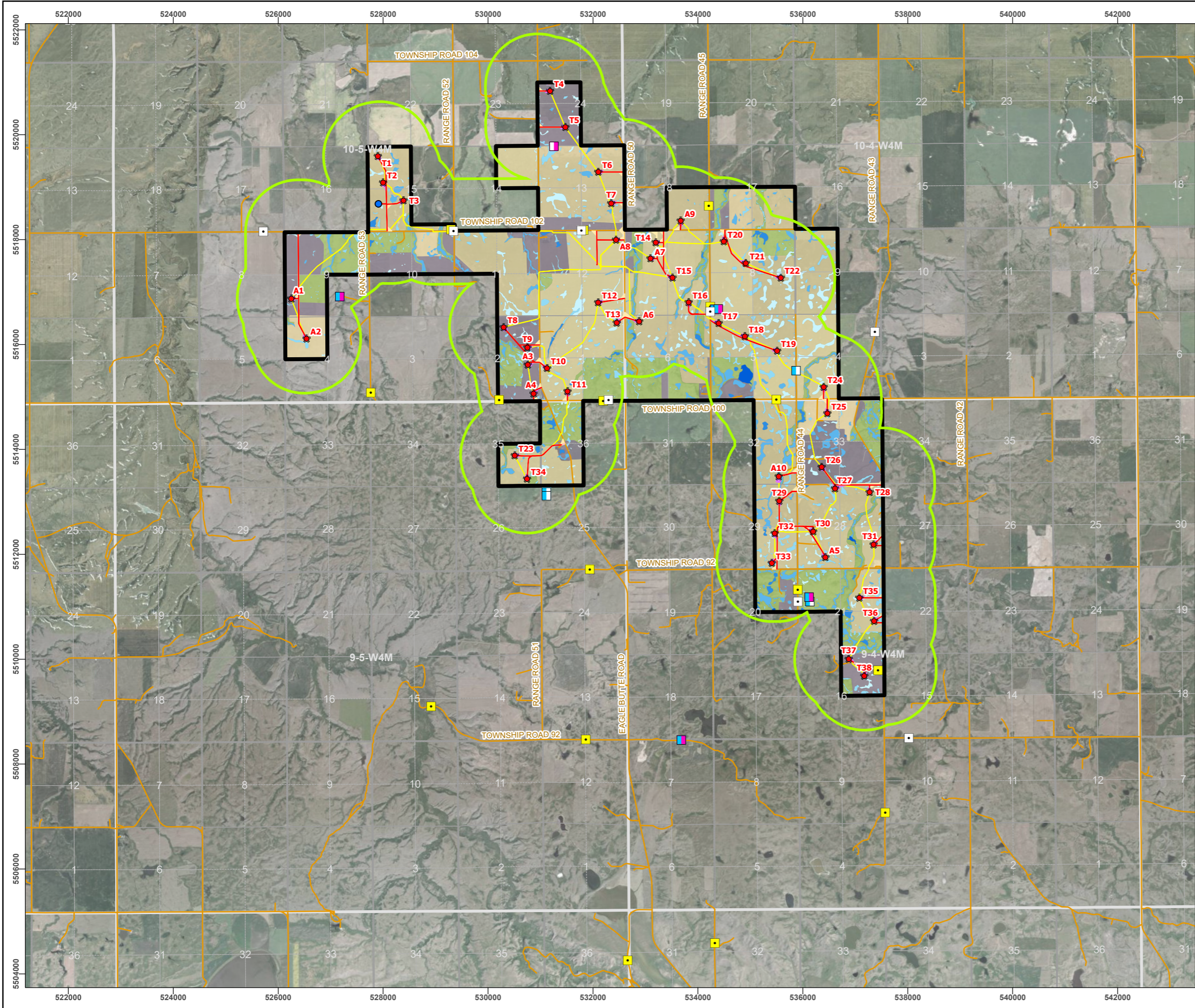


Figure B1a. Bird and Bat Migration Survey Locations

Wild Rose 2 Wind LP

Legend

Survey Locations

- Bat Detector (2015)
- Bat Detector (2015, 2018)
- Bat Detector (2018)
- Migratory Bird Survey Plot (2009, 2012, 2015)
- Migratory Bird Survey Plot (2022)

Project Infrastructure

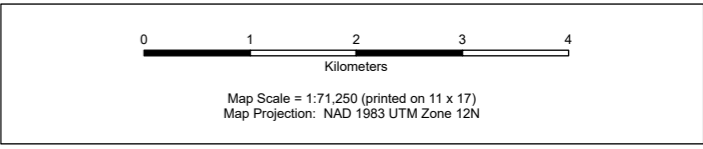
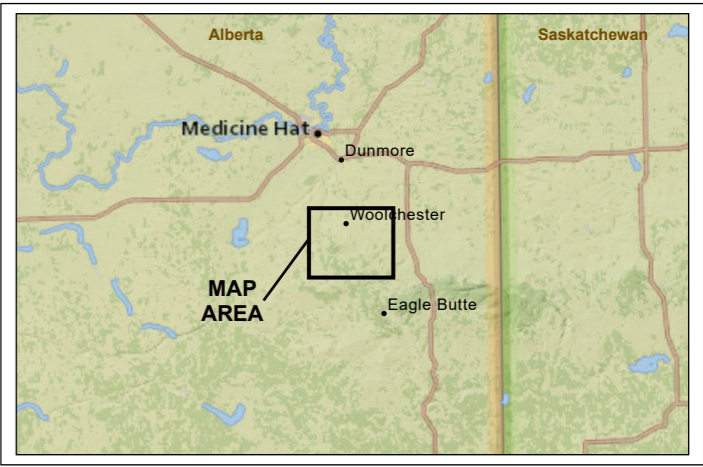
- MET Tower
- Turbine Location
- Turbine Swept Area
- Access - Existing
- Access - Operational Disturbance
- Collector Line - Construction Disturbance
- Access - Construction Disturbance
- Turbine - Construction Disturbance
- Laydown Area
- Amended Layout Project Area
- Wildlife Study Area

Land Cover

- Cultivated
- Farm Yard
- Native Grassland
- Road
- Tame Pasture
- Trail or Unimproved Road
- Wetland - Class I
- Wetland - Class II
- Wetland - Class III
- Wetland - Class IV
- Wetland - Class V

Local Road

- Township
- Section
- Quarter Section



Data Sources

- Project Data. Sept 14, 2022. Wild Rose 2 Wind LP.
- Historical Wildlife Data. Golder 2019, 2021
- Land Cover Data. Sept 13, 2022. Golder Associates Ltd. and EDI Environmental Dynamics Inc.
- Wetland Data. Sept 14, 2022. EDI Environmental Dynamics Inc.
- Inset Basemap. National Geographic World Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Main Basemap. World Imagery: Cypress County, Earthstar Geographics

Disclaimer
EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data has been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

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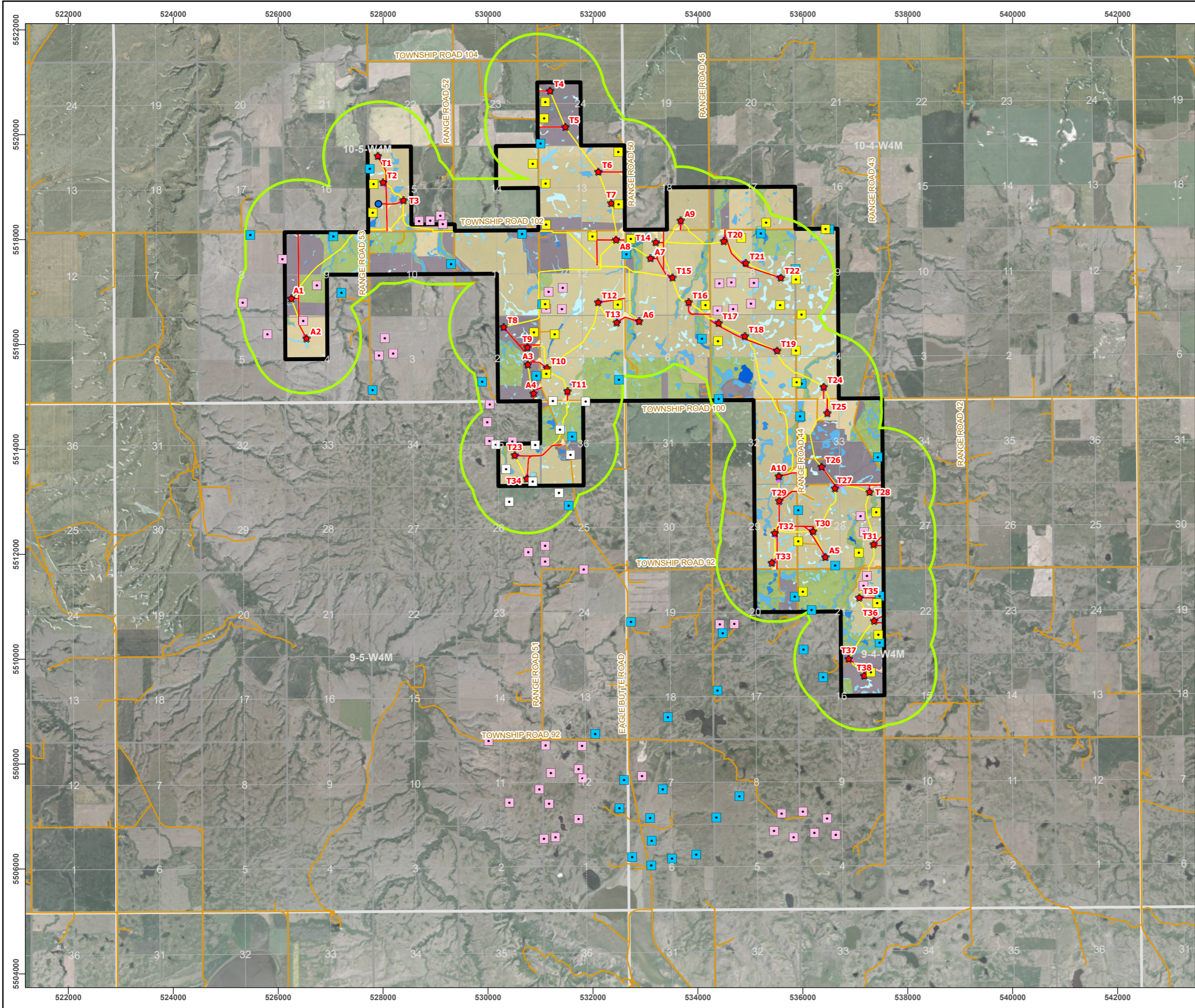


Figure B1b. Breeding Bird Survey Locations

Wild Rose 2 Wind LP

Legend

Survey Locations

■

Breeding Bird Survey (2009)

■

Breeding Bird Survey (2016)

■

Breeding Bird Survey (2021)

■

Breeding Bird Survey (2022)

Project Infrastructure

●

MET Tower

●

Turbine Location

Turbine Swept Area

Access - Existing

Access - Operational Disturbance

Collector Line - Construction Disturbance

Access - Construction Disturbance

Turbine - Construction Disturbance

Laydown Area

Amended Layout Project Area

Wildlife Study Area

Local Road

Township

Section

Quarter Section

Land Cover

Cultivated

Farm Yard

Native Grassland

Road

Tame Pasture

Trail or Unimproved Road

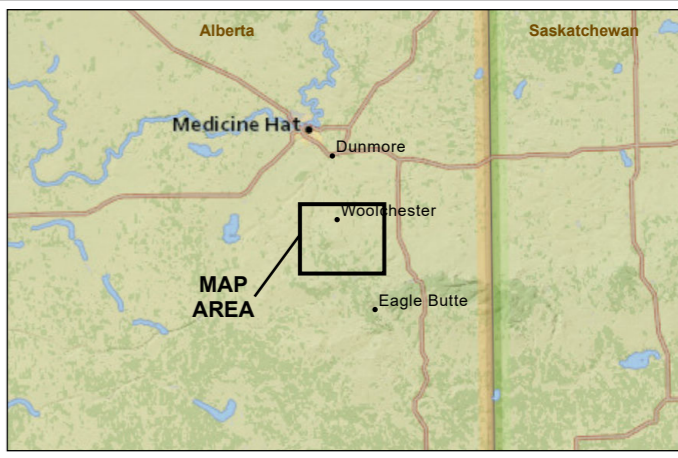
Wetland - Class I

Wetland - Class II

Wetland - Class III

Wetland - Class IV

Wetland - Class V



01234

Kilometers

Map Scale = 1:71,250 (printed on 11 x 17)

Map Projection: NAD 1983 UTM Zone 12N

- Data Sources
- Project Data. Sept 13, 2022. Wild Rose 2 Wind LP.

• Historical Wildlife Data. Golder 2019, 2021

• Land Cover Data. Sept 13, 2022. Golder Associates Ltd. and EDI Environmental Dynamics Inc.

• Wetland Data. Sept 14, 2022. EDI Environmental Dynamics Inc.

• Inset Basemap. National Geographic World Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

• Main Basemap. World Imagery: Cypress County, Earthstar Geographics

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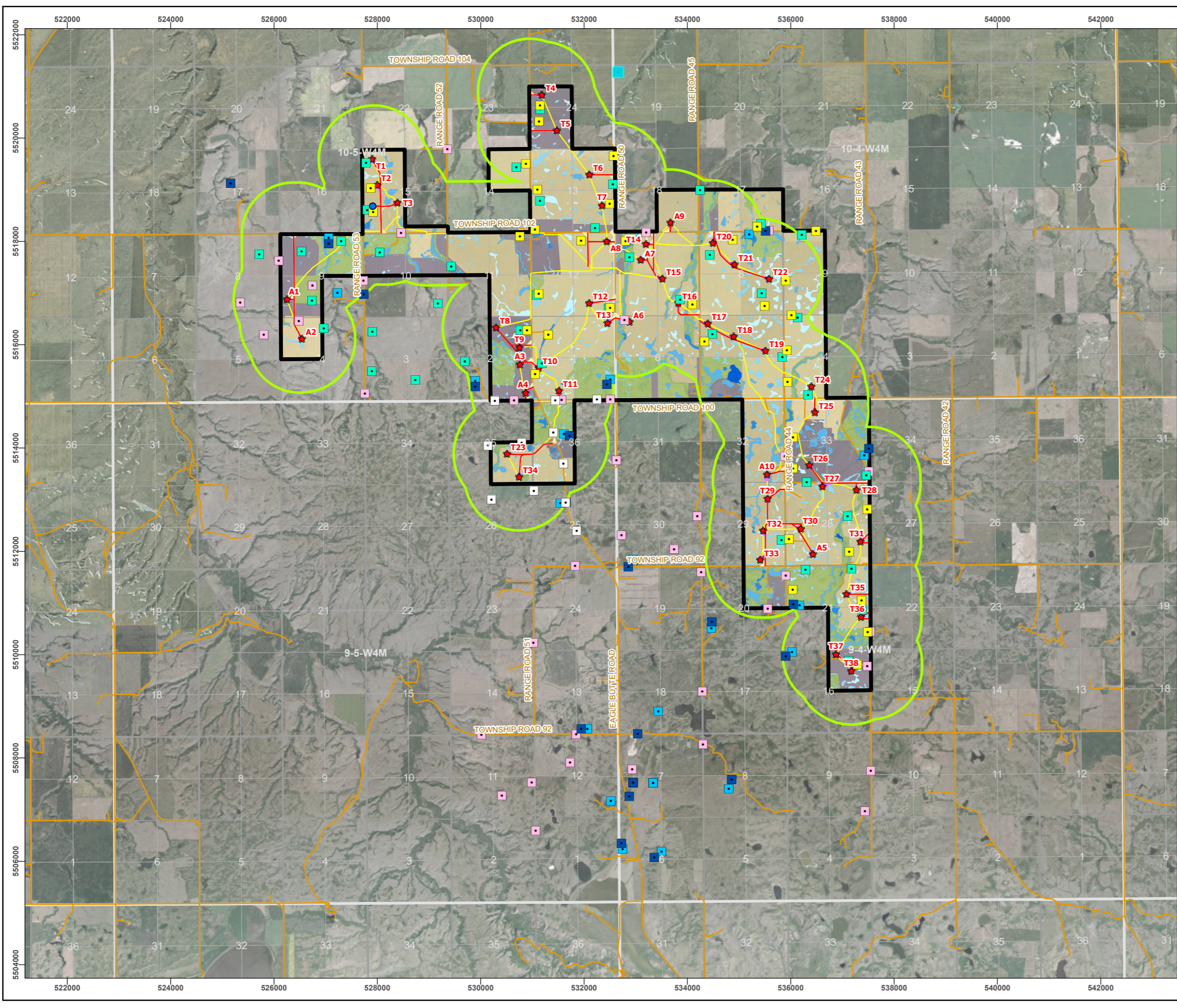


Figure B1c. Burrowing Owl Nest Burrow Survey Locations

Wild Rose 2 Wind LP

Legend

Survey Locations

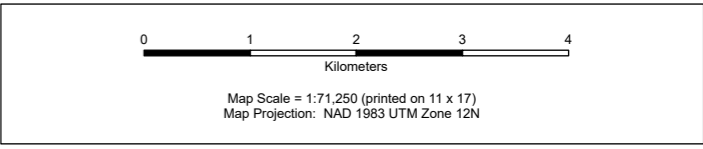
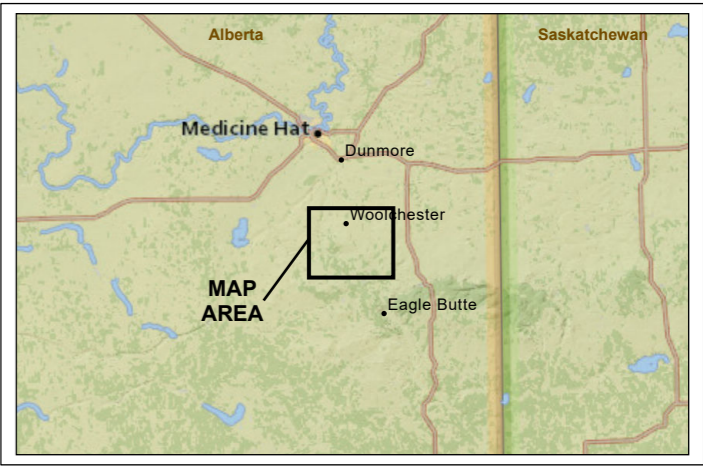
- Burrowing Owl Nest Survey (2009)
- Burrowing Owl Nest Survey (2016)
- Burrowing Owl Nest Survey (2017)
- Burrowing Owl Nest Survey (2019)
- Burrowing Owl Nest Survey (2021)
- Burrowing Owl Nest Survey (2022)

Project Infrastructure

- MET Tower
- Turbine Location
- Turbine Swept Area
- Access - Existing
- Access - Operational Disturbance
- Collector Line - Construction Disturbance
- Access - Construction Disturbance
- Turbine - Construction Disturbance
- Laydown Area
- Amended Layout Project Area

Land Cover

- Wildlife Study Area
- Local Road
- Township
- Section
- Quarter Section
- Cultivated
- Farm Yard
- Native Grassland
- Road
- Tame Pasture
- Trail or Unimproved Road
- Wetland - Class I
- Wetland - Class II
- Wetland - Class III
- Wetland - Class IV
- Wetland - Class V



Data Sources

- Project Data. Sept 13, 2022. Wild Rose 2 Wind LP.
- Historical Wildlife Data. Golder 2019, 2021
- Land Cover Data. Sept 13, 2022. Golder Associates Ltd. and EDI Environmental Dynamics Inc.
- Wetland Data. Sept 14, 2022. EDI Environmental Dynamics Inc.
- Inset Basemap. National Geographic World Map: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
- Main Basemap. World Imagery: Cypress County, Earthstar Geographics

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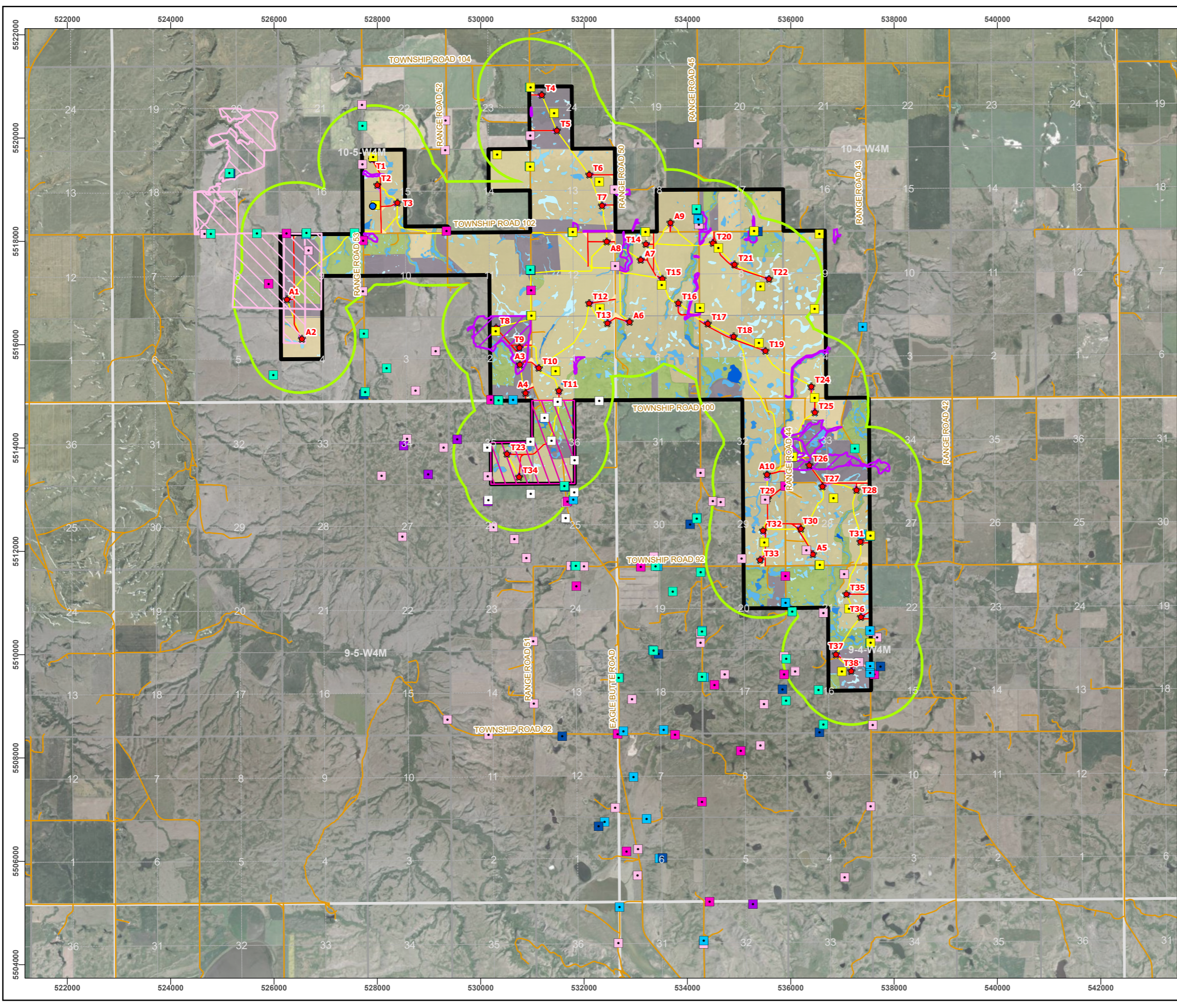


Figure B1d. Sharp-tailed Grouse Lek and Snake Hibernacula Surveys

Wild Rose 2 Wind LP

Legend

Survey Locations

- Sharp-tailed Grouse Lek Survey (2009)
- Sharp-tailed Grouse Lek Survey (2012)
- Sharp-tailed Grouse Lek Survey (2013)
- Sharp-tailed Grouse Lek Survey (2016)
- Sharp-tailed Grouse Lek Survey (2017)
- Sharp-tailed Grouse Lek Survey (2019)
- Sharp-tailed Grouse Lek Survey (2021)
- Sharp-tailed Grouse Lek Survey (2022)

Project Infrastructure

- MET Tower
- Turbine Location
- Turbine Swept Area
- Access - Existing
- Access - Operational Disturbance
- Collector Line - Construction Disturbance
- Access - Construction Disturbance
- Turbine - Construction Disturbance
- Laydown Area
- Amended Layout Project Area

Snake Hibernacula Survey Areas

- 2019
- 2021
- 2022

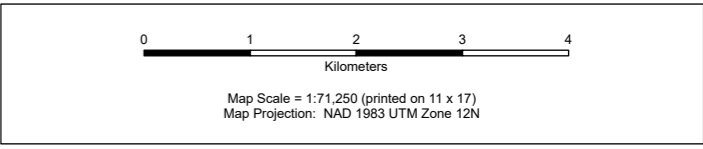
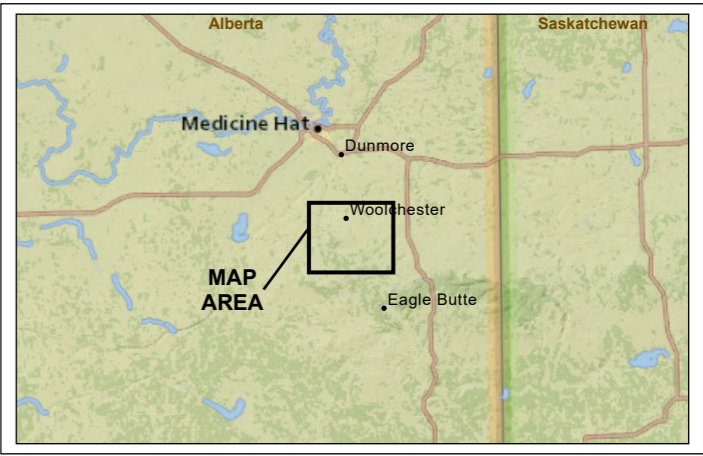
Local Road

- Township
- Section
- Quarter Section

Land Cover

- Cultivated
- Farm Yard
- Native Grassland
- Road
- Tame Pasture
- Trail or Unimproved Road
- Wetland - Class I
- Wetland - Class II
- Wetland - Class III
- Wetland - Class IV
- Wetland - Class V

Wildlife Study Area



Data Sources

- Project Data. Sept 13, 2022. Wild Rose 2 Wind LP.
- Historical Wildlife Data. Golder 2019, 2021.
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