



MEMORANDUM

TO Emily Herdman

DATE March 29, 2017

CC Corey De La Mare, Jacinta McNairn, Julie Carignan, Golder Associates Ltd.

FROM Jeff Sansom, Capital Power

PROJECT No. 1543760

CAPITAL POWER HALKIRK 2 WIND PROJECT ENVIRONMENTAL EVALUATION REPORT – ADDENDUM

Dear Ms. Herdman:

Golder Associates Ltd. (Golder) is pleased to submit this addendum to the Environmental Evaluation (EE) for the Halkirk 2 Wind Power Project (the Project) submitted to Alberta Environment and Parks (AEP) on February 23, 2017. The supplemental information provided in this addendum address the clarifications requested by AEP during the meeting on March 14, 2017.

- 1. AEP requested additional information on the locations of Project footprint encroachment on native prairie habitat. The recommendation from AEP is to avoid any disturbance to native prairie, if feasible.**

The Project footprint, as described in the EE, marginally encroaches native prairie at three locations (Table 1). In each instance, the encroachment results from the construction footprint of an access road. This construction footprint was generated via a geographic information system (GIS) exercise using a fixed 25 meter (m) buffer from the access road centerlines. These access road locations were selected due to existing disturbance (i.e., existing roads will be upgraded for use as Project access roads), and the full 25 m construction right-of-way may not be required in all places.

In response to AEP's recommendation, Capital Power will avoid these three instances of native prairie disturbance by locally reducing the access road construction right-of-way width. As a result, the Project footprint will be slightly modified to exclude the native prairie areas from the access road construction footprint, and no native prairie habitat will be disturbed by the Project construction or operation footprint.

Table 1: Native Prairie within the Project Footprint

Legal Land Description	Project Footprint	Area of Native Prairie (ha)	
		Construction Footprint	Operation Footprint
SW-26-39-14-W4M	Access Road	0.033	0.000
SE-25-39-14-W4M	Access Road	0.003	0.000
NW-15-40-14-W4M	Access Road	0.004	0.000
Total		0.040	0.000

- 2. AEP requested additional information on the encroachment of Project infrastructure within the wetland buffers.**

Capital Power undertook an exhaustive siting exercise with several (10 major iterations) iterations that resulted in no turbines being permanently located within 100 m buffer of wetlands. However, there are some access roads



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that will be permanently located within wetlands buffers. For indirect effects to wetlands from roads, Capital Power followed the best management practice outlined in *Stepping Back from the Water* (AEP 2012) of a 20 m vegetated buffer on glacial till materials with <5% strip slope. The number of wetlands within 20 m from permanent access are as follows:

- The EE identified 11 wetlands that will require compensation, resulting in a loss of 0.2 ha of wetlands.
- An additional 23 wetlands identified occur within 20 m of permanent access roads, of these 13 occur within cultivated lands, 4 within desktop assessed agricultural lands (i.e., not field-verified), 4 are within modified pasture and 2 are within wooded cover types (i.e., likely in a windrow). These wetland boundaries were largely delineated through desktop interpretation and 10% of wetland permanency classes III-V were field verified. Consequently, additional changes to wetland boundaries and/or permanent road locations may affect the realized number of wetlands within 20 m of permanent access roads. Capital Power will diligently reduce this number where it addresses the needs of the landowner (i.e., minimizes impacts to farming operations) and where there is the opportunity to move roads.

3. AEP requested additional information on Project infrastructure located within Environmentally Sensitive Areas (ESAs).

The Project infrastructure located within ESAs is described in Table 2. All of the infrastructure described in Table 2 is sited on cultivated land.

Table 2: Environmentally Sensitive Areas within the Project Footprint

Legal Land Description	Project Footprint	Area of ESA (ha)	
		Construction Footprint	Operation Footprint
SE 31-039-13 W4M	Turbine T103	0.87	0.18
SE 31-039-13 W4M	Access Road	0.65	0.19
SE 31-039-13 W4M	Collector System	0.63	0.00
NW 25-039-14 W4M	Turbine T091B	0.74	0.16
NW 25-039-14 W4M	Access Road	3.89	1.26
NW 25-039-14 W4M	Collector System	1.42	0.00
NW 25-039-14 W4M	Crane Path	0.40	0.00
SE 25-039-14 W4M	Turbine T116	0.87	0.18
SE 25-039-14 W4M	Access Road	0.29	0.06
SE 25-039-14 W4M	Collector System	0.27	0.00
NW 27-039-14 W4M	Turbine T080A	0.83	0.18
NW 27-039-14 W4M	Access Road	2.18	0.68
NW 27-039-14 W4M	Collector System	0.65	0.00
SW 36-039-14 W4M	Turbine T092A	0.88	0.18
SW 36-039-14 W4M	Access Road	1.86	0.59
SW 36-039-14 W4M	Collector System	0.26	0.00
SW 04-040-14 W4M	Turbine T057A	0.88	0.18
SW 04-040-14 W4M	Access Road	0.53	0.16
SW 04-040-14 W4M	Collector System	1.72	0.00



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Legal Land Description	Project Footprint	Area of ESA (ha)	
		Construction Footprint	Operation Footprint
SE 07-040-14 W4M	Turbine T039B	0.87	0.18
SE 07-040-14 W4M	Access Road	0.82	0.25
SE 07-040-14 W4M	Collector System	1.08	0.00
SE 07-040-14 W4M	Crane Path	0.61	0.00
NE 35-039-15 W4M	Substation	2.51	0.60
NE 35-039-15 W4M	Turbine T022A	0.87	0.18
NE 35-039-15 W4M	Access Road	1.51	0.47
NE 35-039-15 W4M	Collector System	1.13	0.00
NE 03-040-15 W4M	Access Road	0.25	0.07
NW 09-040-15 W4M	Collector System	0.07	0.00
SE 12-040-15 W4M	Access Road	0.43	0.13
Total		29.99	5.85

Erratum:

On Page 34 of the EE Report, the following incorrect statement can be found:

None of the turbines are located within these ESAs; however, some supporting infrastructure (e.g., access roads and underground collector system) are located within these ESAs.

In actuality, eight (8) turbines, the substation and access roads will be permanently located within these ESAs and collectively comprise a total footprint of 5.85 ha, of which the majority of the footprint is comprised of access roads (i.e., 3.86 ha).

4. AEP requested additional information on the acoustic bat data gaps.

Bat surveys were completed in the spring (April 28 – June 12), and in the summer/fall period (July 13 – October 16), with the migratory season (August 1 – September 10) presented separately, but also included in the summer/fall data. Table 3 below outlines the missing detector data (i.e., number of nights and timing).

Table 3: Acoustic Bat Data Gaps

Detector	General Location	Number of Spring Nights Missing (46 nights/detector)	Number of Summer/Fall Nights Missing (96 nights/detector)	Number of Fall Migratory Nights Missing (41 nights/detector)
CPHBO1G	NW quadrant	2	0	0
CPHB02M	30 m height in NW quadrant	2	16	13
CPHB03G	eastern edge	1	15	3
CPHB04G	NE quadrant	3	8	5
CPHB05M	30 m height in NE quadrant	8	15	8
CPHB06G	north central	2	0	0
CPHB07G	NW corner	14	20	10



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Detector	General Location	Number of Spring Nights Missing (46 nights/detector)	Number of Summer/Fall Nights Missing (96 nights/detector)	Number of Fall Migratory Nights Missing (41 nights/detector)
CPHB08G	south central edge	6	16	8
Total		38	90	47

Passes per detector night, however, were calculated based on sampling effort and not maximum potential sampling effort, which would have diluted results. The percentage of missing sampling nights is as follows based on the maximum potential sampling effort for each period:

- Spring – 10.3% (i.e., 38 missing nights of a total potential maximum of 368);
- Total Summer/Fall – 11.7% (i.e., 90 missing nights of a total potential maximum of 768); and
- Fall Migratory – 14.3% (i.e., 47 missing nights of a total potential maximum of 328).

The majority (23 missing nights) of the missing detector nights in the spring were for Detector CPHB05M and CPHB08G from May 20 – May 24 and CPHB07G from May 31 through June 12. Remaining missing detector nights were predominantly during the first night of deployment (6 nights) and the last few nights of deployment (9 missing nights over the last two nights of deployment).

For the Total Summer/Fall (July 13 – October 16) and the Fall Migratory season (August 1 – September 10), the majority of detector nights with no sampling are presented as follows:

- Six detectors, all but CPHB06G and CPHB07G, on the first night (July 13);
- CPHB02M: Aug 10-12, Aug 29 – Sep 6 (9 nights), Sep 10-12;
- CPHB03G: July 21 - August 3 (14 nights);
- CPHB04G: July 30 – Aug 3 (5 nights), Aug 11- 12;
- CPHB05M: July 23 - 26 (4 nights), July 30-31, Aug 13-20 (8 nights);
- CPHB07G: July 15 – July 20 (6 nights), Aug 11 - 12, Aug 18 – Aug 20, Sep 7-12; and
- CPHB08G: Aug 30 – Sep 6 (8 nights), Oct 6 – Oct 10.

5. AEP stated that no clearing of vegetation shall be completed during bird and bat carcass surveys and searcher efficiency trials during post construction monitoring.

Capital Power acknowledges this statement and will not clear vegetation underneath the turbines during bird and bat carcass surveys or searcher efficiency trials associated with the post construction monitoring for the Project.

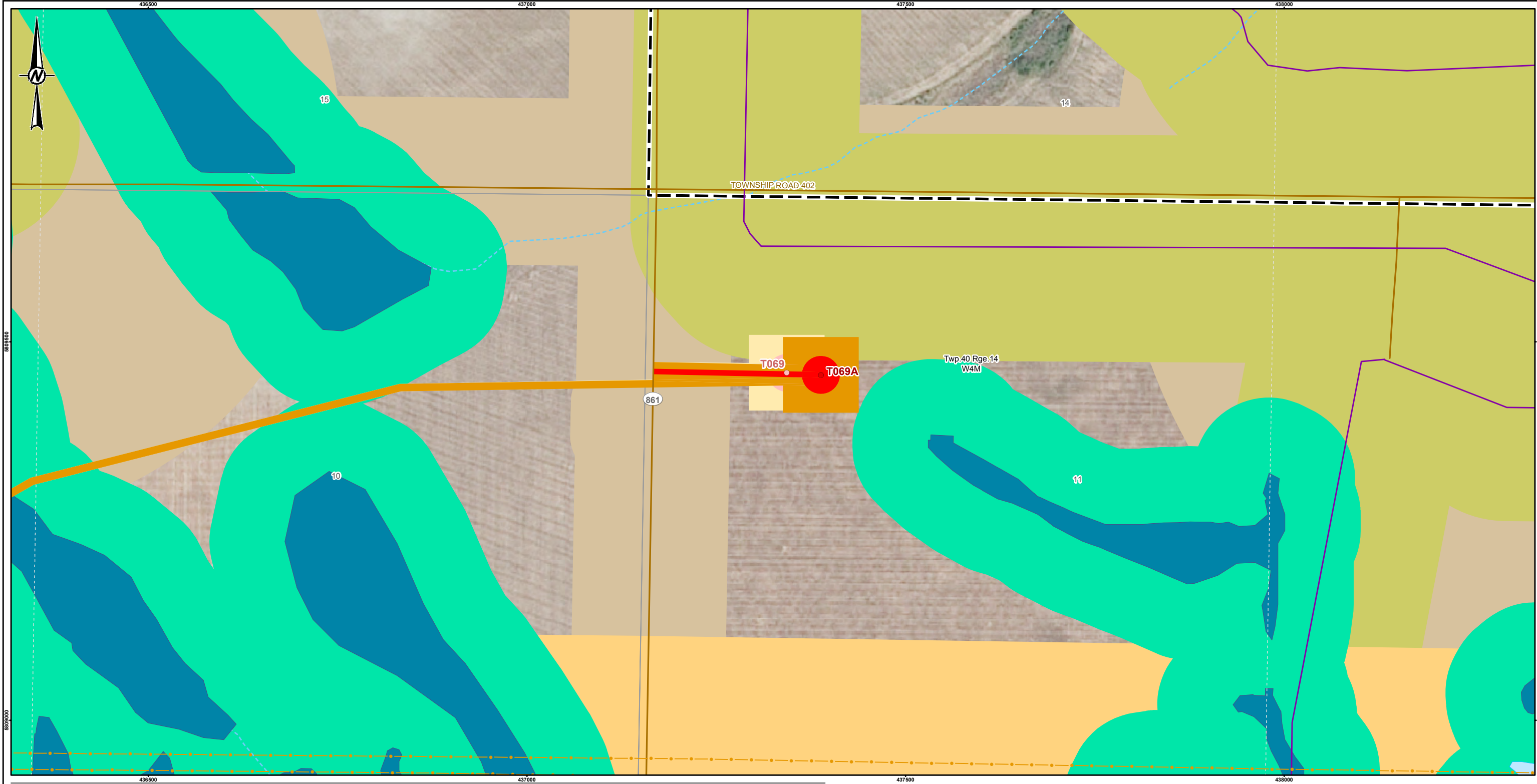


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6. Alberta Transportation required that Project infrastructure meet the minimum setback distance of 150 meters from the Highway 861 right-of-way to issue a permit.

To support Alberta Transportation Roadside Development Permit issuance, Capital Power moved turbine T069 outside the minimum setback requirement of 150 meters from the highway right-of-way. The new turbine location, T069A, was relocated 45 meters east of the original location (Figure 1) and its associated access road, crane path and collector system were slightly extended to accommodate this request from Alberta Transportation.

Avoidance of wetlands is the primary mitigation employed during construction and operation of the Project by Capital Power; therefore; turbine T069A and its associated Project components have been re-sited to avoid both permanent and temporary effects on wetlands. Additionally, no indirect impact to wetlands is anticipated from this change as the nearest Project component is located 98 m from the nearest wetland.



- LEGEND**
- PROJECT AREA
 - PROPOSED TURBINE
 - PREVIOUSLY PROPOSED TURBINE
 - PERMANENT PROPOSED PROJECT INFRASTRUCTURE
 - TEMPORARY PROPOSED PROJECT INFRASTRUCTURE
 - PERMANENT PREVIOUSLY PROPOSED PROJECT INFRASTRUCTURE
 - TEMPORARY PREVIOUSLY PROPOSED PROJECT INFRASTRUCTURE
 - HIGH PRESSURE PIPELINE
 - ROAD/HIGHWAY
 - INDEFINITE WATERCOURSE
 - TRANSMISSION LINE
 - WETLAND PERMANENCE CLASS I-II^{A,B}
 - WETLAND PERMANENCE CLASS III-V^{A,B}
 - WETLAND CLASS I OR II 30 m SETBACK
 - WETLAND CLASS III OR UP 100 m SETBACK
 - COUNTY BYLAW SETBACK
 - PIPELINE SETBACK^C
 - TRANSMISSION LINE ROW SETBACK^C



CLIENT
Capital Power

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-28
DESIGNED	SG
PREPARED	SK
REVIEWED	SG
APPROVED	JS

NOTE(S)
^AWETLANDS MAY BE DESKTOP OR FIELD VERIFIED.
^BSTEWART AND KANTRUD (1971) WETLAND CLASSIFICATION SYSTEM. ALBERTA ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT. 2015. ALBERTA WETLAND CLASSIFICATION SYSTEM. WATER POLICY BRANCH, POLICY AND PLANNING DIVISION, EDMONTON, AB.
^CTHESE SETBACK LAYERS ARE SHOWN FOR THE V110 TURBINE MODEL.

REFERENCE(S)
1. ALBERTA TOWNSHIP SYSTEM, HYDROGRAPHY AND TRANSPORTATION BASE DATA © GOVERNMENT OF ALBERTA 2015. ALL RIGHTS RESERVED.
2. IMAGERY OBTAINED FROM THE CLIENT.
DATUM: NAD83 PROJECTION: UTM ZONE 12

PROJECT
HALKIRK 2 WIND PROJECT

TITLE
T069 TO T069A RELOCATION

PROJECT NO. 1543760	CONTROL	REV. A	FIGURE 1
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PATH: I:\2015\1543760\Mapping\WCD\General\Halkirk_2_T069_Update_RevA.mxd PRINTED ON: 2017-03-28 AT: 2:39:20 PM

25mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B