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File #17-00108

April 25, 2017

Hatch Infrastructure
840 - 7th Avenue SW
Calgary Alberta T2P 3G2

Attention: Kelly McGarry

RE: Biophysical Assessment SW-09-039-25 W4M

INTRODUCTION

Millennium EMS Solutions Ltd. (MEMS) was contracted by Hatch Infrastructure (Hatch) to conduct a biophysical assessment of the proposed Joffre Facility Expansion project (the Site) proposed by Procor Limited (Procor). The expansion project involves the addition of several tracks to the existing railway facility. The site is located just over a kilometre west of Joffre, Alberta, in Section 9 Township 39 Range 25 West of the Fourth Meridian (SW-09-039-25- W4M).

The assessment and report of the findings of the assessment have been prepared for future regulatory applications to Lacombe County for the proposed expansion and follow the requirements established in the Lacombe County's Multi-Lot Development Proposals: Lacombe County's Guide to the Approval Process (Lacombe County 2015).

LOCAL SETTING

The Site is located on freehold land in the County of Lacombe, approximately one kilometre west of the hamlet of Joffre, Alberta. The project footprint includes an existing train yard owned by Procor and a portion of the project footprint and surrounding area has been zoned as industrial.

The land use surrounding the project footprint is predominantly agricultural (cereal crops). The existing and proposed project footprint itself is situated in a low-relief hummocky field that had previously been seeded to barley. Jones Creek, a non-fish bearing creek, crosses the southwest corner of the lease and another unnamed non-fish bearing creek is located approximately 200 m to the east of the project footprint.

ASSESSMENT METHODOLOGY

The methodologies for the desktop and field assessments are provided below.

Desktop Assessment

The proposed project footprint was projected onto recent aerial imagery to create a field map. The Alberta Merged Wetland Inventory layer was also added to this field map for a reference to wetland locations. Following this, a review was conducted of all existing information pertaining to biophysical resources along the proposed route.

The following databases were searched for historical information:

- Natural Regions and Subregions of Alberta (Natural Regions Committee 2006);
- Watersheds of Alberta (Government of Alberta 2016a);
- Surficial Geology of the Red Deer-Stettler Map-Area and associated map sheet 83A (Stalker, A. MacS. 1960);
- Alberta Agriculture and Rural Development's Agroclimatic Information Service (ACIS) (Government of Alberta 2016b);
- Alberta Soil Information Viewer (Government of Alberta 2016c);
- Alberta Conservation Information Management System (ACIMS) (ACIMS 2016);
- Fisheries & Wildlife Management Information System (FWMIS) (Government of Alberta 2016d);
- Estimated Wetland Value by Section layer of the GeoDiscover Alberta Viewer (Government of Alberta 2016e);
- Lacombe County website (Lacombe County 2017) for clubroot occurrences and weeds of concern in the County; and

- Listing of Historical Resources – September 2016 (Government of Alberta 2016f).

Historical air photos were ordered to track land use changes as well as to help determine the historical boundaries and permanence of wetlands in proximity to the proposed project footprint. The selection of the air photos was based on climatic data obtained from Alberta Agriculture and Rural Development's Agroclimatic Information Service (ACIS) website (Government of Alberta 2016b) to ensure inclusion of wet years, dry years and near normal years. The selected aerial photographs and the yearly precipitation for each year of the selected photograph are presented in Table 1.

Table 1 Historical Aerial Photographs and Climatic Data

Air Photo (MM/DD/YY)	Photo ID (Roll AS# and Photo)	Resolution	Season[1]	Precipitation Year (Dry, Wet, Normal, Near Normal)	Yearly Precipitation (mm)[2]
9/23/1950	AS152 Frame 59	1:40000	Fall	Not available	Not available
7/2/1969	AS1017 Frame 239	1:31680	Summer	Near Normal	476
4/28/1980	AS2157 Frame 54	1:60000	Spring	Wet	522
6/4/1987	AS3588 Frame 145	1:30000	Spring	Dry	372
6/23/1994	AS4494 Frame 201	1:30000	Spring	Wet	533
6/3/2009	AS5469B Frame 80	1:20000	Spring	Dry	325

1 Spring (April-June); Summer (June-Sept); Fall (Sept-Nov.)

2 Government of Alberta 2016b. Alberta Agriculture and Rural Development's Agroclimatic Information Service (ACIS) website.

Field Assessment

A biophysical assessment was conducted on April 18, 2017. The proposed extension of the project footprint was traversed on foot. GPS coordinates and photographs were taken at points of interest within the proposed project footprint. Topography, hydrology, vegetation, wildlife, and soils were investigated during the field assessment and are described below.

Topography

Overall landscape characteristics such as surface expression, slope and drainage were observed and recorded for the project footprint.

Hydrology

Wetlands identified during the desktop review were assessed and classified according to the Alberta Wetland Classification System (AWCS). The review of historical information, as well as the field survey and delineation of the Site, were based on the *Alberta Wetland Identification and Delineation Directive* (Government of Alberta 2015a). Due to snow cover and the season during which this survey was conducted, wetland boundaries could not be delineated in the field using vegetation species and were instead defined using historic and current air photo imagery. The representative wet, normal, and dry years were overlain and delineated by hand. The wetlands were mapped and are presented in Figure 1.

Vegetation

A search for reports of rare plants within the project footprint was conducted using the ACIMS. Due to snow cover at the timing of the survey, a complete species list of the vegetation was not obtainable due to existing snow cover. Land use and standing vegetation above existing snow cover from the previous growing season was recorded, where possible.

Weeds identified as '*Noxious*' under the Alberta *Weed Act* (Government of Alberta 2010), and invasive species considered weedy by land use managers but not listed under the *Weed Act* were identified and recorded within the proposed project footprint.

Wildlife

Wildlife sightings and indirect wildlife observations (nests, tracks, *etc*.) were recorded. A search of the proposed project footprint for potential biodiversity hotspots and critical breeding, nesting, or wintering sites was also conducted.

Soils

Soil pits were dug with a hand shovel to a maximum depth of 30 cm to describe soils. Topsoil depth was recorded and soil horizons were assessed for texture, colour, and any other special features.

RESULTS

Observations from the historical aerial photograph review and the field assessment are provided below.

Historical Air Photos

A summary of the area as identified in the historical photograph review is presented in Table 2.

Table 2 Summary of Historical Aerial Photograph Review

Year of Aerial Photograph	Comments
1950	Hamlet of Joffre is visible. Train tracks are not yet present. Land use is cultivated.
1969	Train tracks are not yet present. Land use remains cultivated.
1980	A single train track is now visible, running north/south along the west side of the Site and then curving east towards Joffre. Land use remains cultivated. Two isolated patches of trees have since been cleared from the Project area and are being cultivated through.
1987	The cultivation boundary and the unnamed creek east of the Project area are more clearly visible.
1994	A rail yard and additional tracks are now visible. A drainage ditch is evident along the east side of the tracks and rail yard, draining toward the treed area at the south end of the Project area.
2009	The unnamed creek to the east is more clearly defined. An area just off-site, located along the northern edge of the cultivated field adjacent to the tracks, appears to be holding water.

Surficial Geology/Topography

The surficial geology of the project footprint is composed mainly of ground moraines, or an irregular blanket of till deposited under a glacier (Britannia 2009). Surficial deposits consist mainly of clay and sand till of the upper Paskapoo formation and its surface is typically strongly rolling with broad, rounded hills (Stalker, A. MacS. 1960). Although seldom more than 5 metres thick, thicknesses may reach as much as 20 m (Britannica 2016).

A field assessment was conducted on April 18, 2017. Snow cover was present on the ground and snow was continuing to fall at the time of the assessment. The surface expression was characterized as hummocky, with gentle slopes and overall drainage to the south and southeast towards the shrubby riparian areas along the creek.

A sharp delineation was noted where the cultivated field meets the steep bank of the shrubby riparian area, which was identified as a potential marsh by the Alberta Merged Wetland Inventory database.

A drainage ditch was noted on the west side of the fence line that separates the tracks from the cultivated field, with existing culverts running beneath the tracks. The ditch appeared well vegetated at the time of the assessment.

Hydrology

The project footprint is situated within the South Saskatchewan River Basin and the Red Deer River watershed (Government of Alberta 2016a). Jones Creek, a non-fish bearing creek, crosses the southwest corner of the lease and another unnamed non-fish bearing creek is located approximately 200 m to the east of the project footprint. The average yearly precipitation from 1961 to 2016 is 467 mm (Government of Alberta 2016b).

The preliminary search of the estimated wetland value identified 17 ha of Category D value wetlands within Section 09-039-25 W4M. During the desktop review, the Alberta Merged Wetland Inventory (AMWI) located a potential marsh in the southwest corner of the project footprint as well as just crossing the northeast tip of the project footprint. The potential marsh located at the northeast tip of the project footprint correlates to the area holding water in the 2009 aerial photograph. There is no evidence in any of the historical photographs of the presence of permanent or semi-permanent open water in this wetland and aerial photographs show that it is historically cultivated through. Furthermore, it located just off-site, on the edge of the project footprint, and no disturbance to this wetland is planned.

During the April 18, 2017, field visit, wetland boundaries could not be properly delineated in the field due to snow cover; consequently, were defined using historic and current air photo imagery. The areas to the south of the site that were identified as potential marshes by the AMWI database were identified in the field as shrubby riparian areas. Based on the desktop review and field observations, the potential marsh to the northeast of the site was identified as an ephemeral or temporary graminoid marsh. Rutting and crop stubble were noted within the boundary of the marsh, indicating that it had formerly been cultivated through and harvested. As direct disturbance to this wetland will not be occurring; subsequently, a *Water Act* Application will not be required. An application will be required if disturbance is to occur within the wetland. Submission of the Alberta Wetland Rapid Evaluation Tool (ABWRET-A) for determination of relative wetland value is not required as disturbance will not be undertaken in the wetland.

A drainage ditch was noted onsite between the existing railway spur and the cultivated field that drains into the shrubby riparian area to the south. The ditch was filled with water and snow, but appeared vegetated and, according to the Procor supervisor, it is lined with riprap for sediment control.

Further hydrological details are discussed in the Drainage Assessment provided in Memo H-158040-MEM-WP-001 provided by Hatch (2017).

Vegetation

The project footprint is situated within the South Saskatchewan River Basin (Government of Alberta 2016a) in the Central Parkland Natural Subregion of the Parkland Natural Region of Alberta (Natural Regions Committee 2006). A desktop search of the ACIMS database was conducted on April 19, 2017 and did not identify any occurrences of rare or listed species in the area of the Project. A search of the Lacombe county website was conducted on April 19, 2017 for clubroot occurrences and weeds of concern in the County. There was no incidence of clubroot in the township of the project footprint in 2016; however, a confirmed case of clubroot was historically identified in one field between 2008 and 2016. *Prohibited Noxious* weed species of concern in Lacombe County include Spotted Knapweed and Himalayan Balsam. *Noxious* weed species of concern in Lacombe County include Canada thistle, Common Tansy, Field Scabious, Leafy Spurge, Perennial Sow Thistle, Tall Buttercup, White Cockle, and Yellow Toadflax.

During the April 18, 2017, onsite visit, vegetation consisted of remnant stubble from a formerly cultivated field and a low cut and maintained grass area in the northwest portion of the project footprint. Senesced heads found onsite suggest that the cultivated portion of the project was previously seeded to barley. A small brush pile was noted along the edge of cultivation in the southern portion of the project footprint.

There were no occurrences of rare or listed plants reported on ACMIS, and no occurrences were observed in the project footprint during the field visit. Based on no previous reports and the current industry and agriculture use, there is low potential for rare plant occurrence in the project footprint.

Senesced Canada thistle (*Cirsium arvense*), a *Noxious* species under the Alberta *Weed Act* (Government of Alberta 2010), was observed along the east side of the fence line, from the parking of the existing facility to the shrubby riparian area. There were no other occurrences of *Prohibitive Noxious*, *Noxious*, or species classified as weedy or invasive observed during the assessment.

Wildlife

A search of the FWMIS database was conducted on April 19, 2017. No records of fish were identified within the one km search radius of the project footprint; however, four records of bird species were identified. These species were compared to Alberta's list of Species at Risk (Government of Alberta 2014) and a Wild Species Status Search (Alberta Environment and Parks 2011) was also conducted. The species and their statuses are presented in Table 3 below.

Table 3 Summary of Wild Species Status Search

Scientific Name	Common Name	Status 2016 [1]	Status 2010 [2]	Status 2005 [2]	Status 2000 [2]	Comment
Hirundo rustica	Barn Swallow	Not Listed	Sensitive	Sensitive	Secure	A common species that is declining in Alberta and all surrounding jurisdictions.
Tyrannus tyrannus	Eastern Kingbird	Not Listed	Secure	Secure	Secure	-
Empidonax minimus	Least Flycatcher	Not Listed	Sensitive	Sensitive	Secure	Species has been declining in Alberta and surrounding jurisdictions. May be threatened by habitat changes on wintering range.
Porzana carolina	Sora	Not Listed	Sensitive	Sensitive	Secure	Large (>50%) declines have occurred in Alberta and all surrounding jurisdictions since 1994. Species threatened by loss of wetland habitat.

1 Status taken from Alberta's list of Species at Risk (Government of Alberta 2014)

2 Species status and comments from Wild Species Status Search (Alberta Environment and Parks 2011)

Two Canada geese (*Branta canadensis*) were observed outside of the project footprint, to the east. Evidence of beaver activity and a lodge was observed in the shrubby riparian area along Jones Creek just outside of the project footprint, to the south. None of the species identified in the FWMIS search in the desktop review were observed at the time of the survey. There were no signs of nesting, denning, or other wildlife activity noted onsite at the time of the survey.

Soils

A review of the Alberta Soil Information Viewer (Government of Alberta 2016c) found that the existing and proposed project footprint is situated on a hummocky, low relief landform with medium textured till over soft rock and a limiting slope of 6%. Soils are predominantly medium-well drained Black Solodized Solonetzic soils of the Kavanagh soil series are found on mid to low slope positions and depressional areas (Government of Alberta 2016c).

During the field visit, soils onsite consisted of 18 to 30+ cm of loamy topsoil over sandy clay loam subsoil. A distinct color change exists between the black topsoil and brown subsoil (7.5 YR 2.5/1 and 10YR 4/3 the Munsell colour scale, respectively).

Historical Resources

A search was conducted of the Government of Alberta's Listing of Historic Resources (2016) was conducted on April 19, 2017. No records of historical resources were found at the project footprint location.

MITIGATION AND MONITORING RECOMMENDATIONS

Most of the proposed expansion will occur within the existing rail yard, or will extend slightly to the east into the cultivated field. Tree clearing is not planned; therefore, the shrubby riparian area in the southern portion of the project footprint will remain intact. Beaver activities as well as potential nesting, denning or breeding habitat for the sensitive species list in the FWIMIS search will not be affected by the project; as a result, no further wildlife mitigation is required. If tree clearing is required, it should be done outside the migratory bird-breeding season (April to September).

The objective of mitigations for biophysical resources is to ensure construction and operation operations minimize erosion potential, disruption to drainage patterns, sediment runoff, the spread of undesirable or weedy species, and to restore the disturbed area to an equivalent land capability.

Construction

- maintain erosion and sediment control measures around the construction area and ditch to prevent excess sediment runoff from entering the shrubby riparian area and the ephemeral/temporary wetland;
- topsoil shall be stripped to the depth of the colour change and stored in stockpiles separate from subsoil (at least 1 m separation between topsoil and subsoil piles);
- maintain existing culverts to preserve existing drainage patterns;
- extend culverts to maintain drainage, if existing ditch is in-filled for construction of the new line(s);
- ensure equipment enters site in a clean condition to mitigate potential spread of weeds and clubroot spores; and
- upon completion of construction, re-seed to a certified weed-free seed mix in consultation with the landowner.

Operation

- maintain existing vegetation cover in the ditch to help trap sediments and slow down water velocity;

- monitor and control weeds around the railway yard as per the *Alberta Weed Control Act* (Government of Alberta 2010) to prevent spread into cropland and runoff into ditch into the shrubby riparian area; and,
- periodically monitor discharge from the ditch where it enters into the shrubby riparian area for excess sediment load and erosion.

CLOSURE

We thank you for the opportunity to be of assistance to Hatch Infrastructure. Should you have any questions, please contact either of the undersigned at 780.496.9048.

Yours truly,

Millennium EMS Solutions Ltd.

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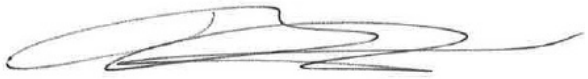
Reviewed by:



Darcy Meyers, P. Ag., P.Biol.
Senior Ecologist

Attachments

Figure 1 – Site Diagram

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R25 W4M

T39

Township Road 391A

CN Rail

Range Road 254

9-3

12-9

11-9

Lawn

Existing Rail Yard

8-8

5-9

Unnamed Creek

6-9

CN Rail

Existing Ditch

Cultivated Field (Barley)

1-8

4-9

Shrubby Riparian Area

3-9

Jones Creek

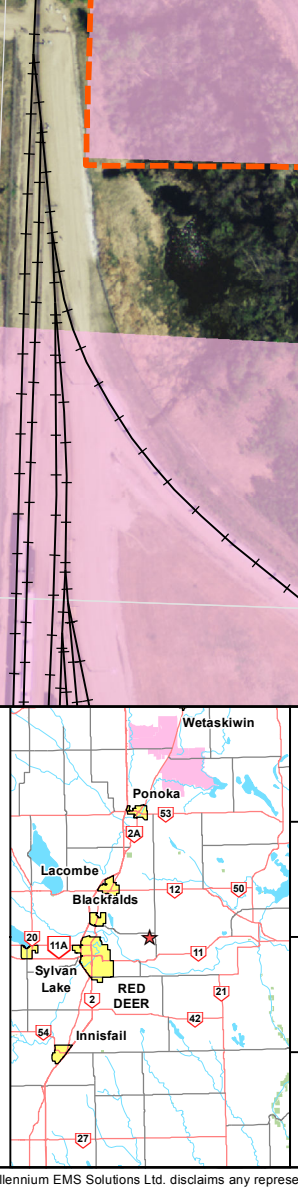
16-5

13-4

14-4

LEGEND

- Project Footprint
- Ephemeral/Temporary Wetland
- Rezoned to Industrial
- Ditch
- Road
- Railway



HATCH

HATCH INFRASTRUCTURE BIOPHYSICAL ASSESSMENT SW-09-039-25 W4M

SITE DIAGRAM

AltaLIS, 2017; MEMS, 2017;
Valtus, 2017 (Image Date: May/July 2013)

Projection/Datum: UTM Zone 12 Nad 83

0 100 200
Metres

MILLENNIUM EMS Solutions Ltd.

PROJECT: 17-00108
DRAWN BY: SL/JL
CHECKED BY: DM
DATE: APRIL 25, 2017

FIGURE
1

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