REPORT

Southwest Calgary Ring Road

Wetland Assessment and Impact Report

Submitted to:

KGL Constructors
18 Seven Chiefs Road
Calgary, Alberta T2W 3X4

Submitted by:

Golder Associates Ltd.
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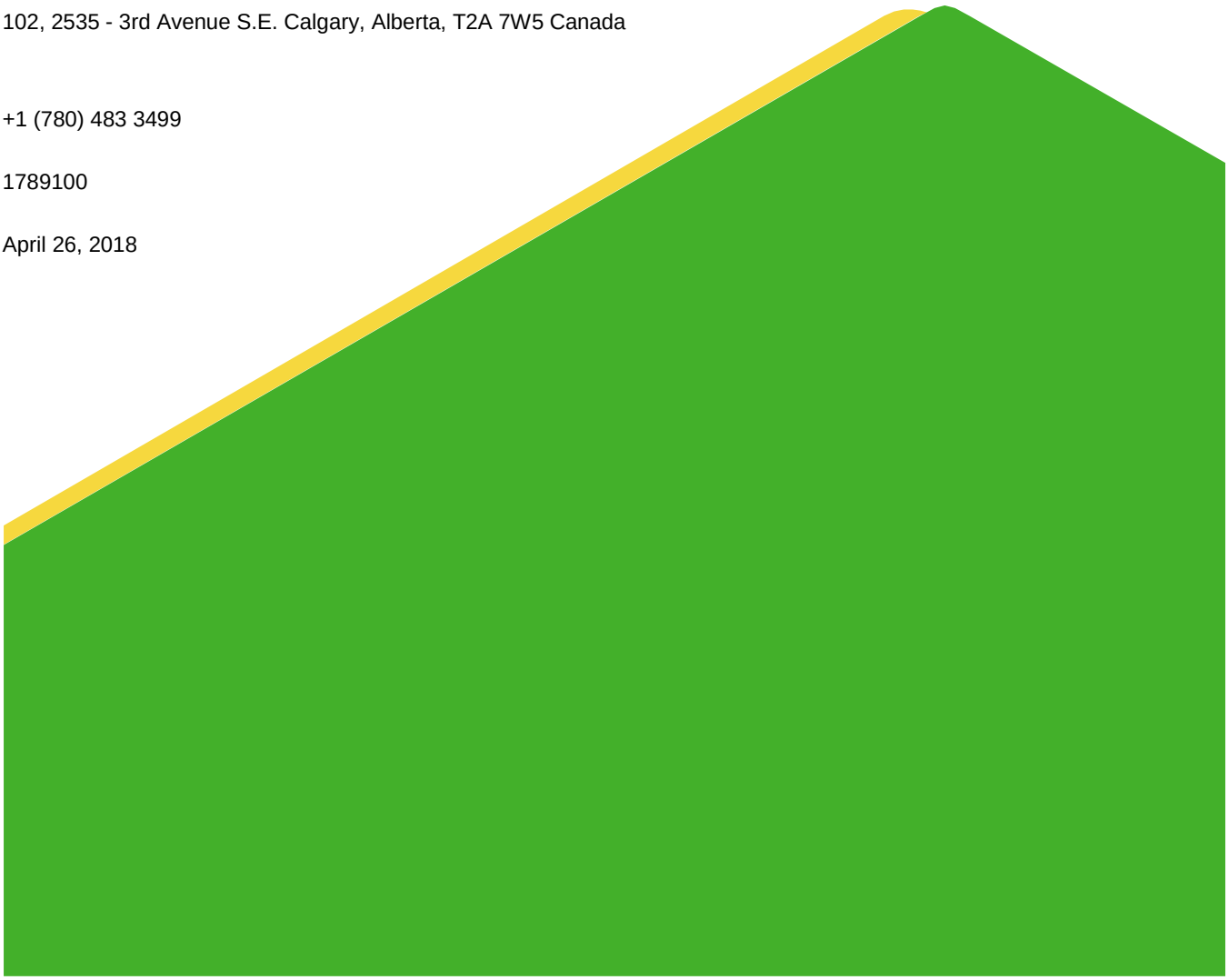
1789100

April 26, 2018



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1.0 INTRODUCTION

The Southwest Calgary Ring Road (SWCRR) Project (the Project) totals 1162 hectares (ha) and includes the design and construction of approximately 31 kilometres (km) of new six and eight lane divided freeway, 14 interchanges, as well as three watercourse realignments and associated crossing structures. The SWCRR corridor is located along the western limit of the City of Calgary south of Highway 8, and includes sections of Highways 8 and 22X (Figure 1, Appendix A).

This project has been awarded by Alberta Transportation to Mountain View Partners, which in turn has engaged KGL Constructors (KGL) to develop the Project. KGL retained Golder Associates Ltd. (Golder) to complete a Wetland Impact Assessment (WIA) (Golder 2016) under the Interim Wetland Policy (Alberta Water Resources Commission 1993) as originally directed by Alberta Environment and Parks (AEP). Approval for the wetland impacts was initially granted under *Water Act* Approval Number 00388473-00-00. On August 11, 2017, an Environmental Appeal was filed (*Brookman and Tulick v. Director, South Saskatchewan Region, AEP*; Appeal Nos. 17-047 and 17-050-R. 2017) affecting KGL's ability to impact wetlands legally described as NW 04-024-02-W5M, SE 03-024-02-W5M, W½ 25-023-02-W5M, E½ 26-023-02-W5M, NW 24-023-02-W5M, SE 24-023-02-W5M, W½ 18-023-01-W5M, E½ 13-023-02-W5M, W½ 31-022-01-W5M, SE 31-022-01- W5M, E ½ 30-022-01-W5M, SW 29-022-01-W5M, NW 20-022-01-W5M, S½ 28-022-01-W5M, W½ 21-022-01-W5M, SW 27-022-01-W5M, N½ 22-022-01-W5M within the SWCRR Project (Project Site).

In support of the final Alberta Environmental Appeals Board decision (Appeals Nos. 17-047 and 17-050-R) and AEP Ministerial Order 06/2018, KGL retained Golder to complete a Wetland Assessment and Impact Report (WAIR) for the twenty-four (24) previously assessed wetlands subject to the Approval based on the directives under the 2013 Alberta Wetland Policy (Government of Alberta [GOA] 2013), and this assessment shall include, at a minimum, the following:

1) a consideration of any further options that may be available for wetland avoidance or mitigation;

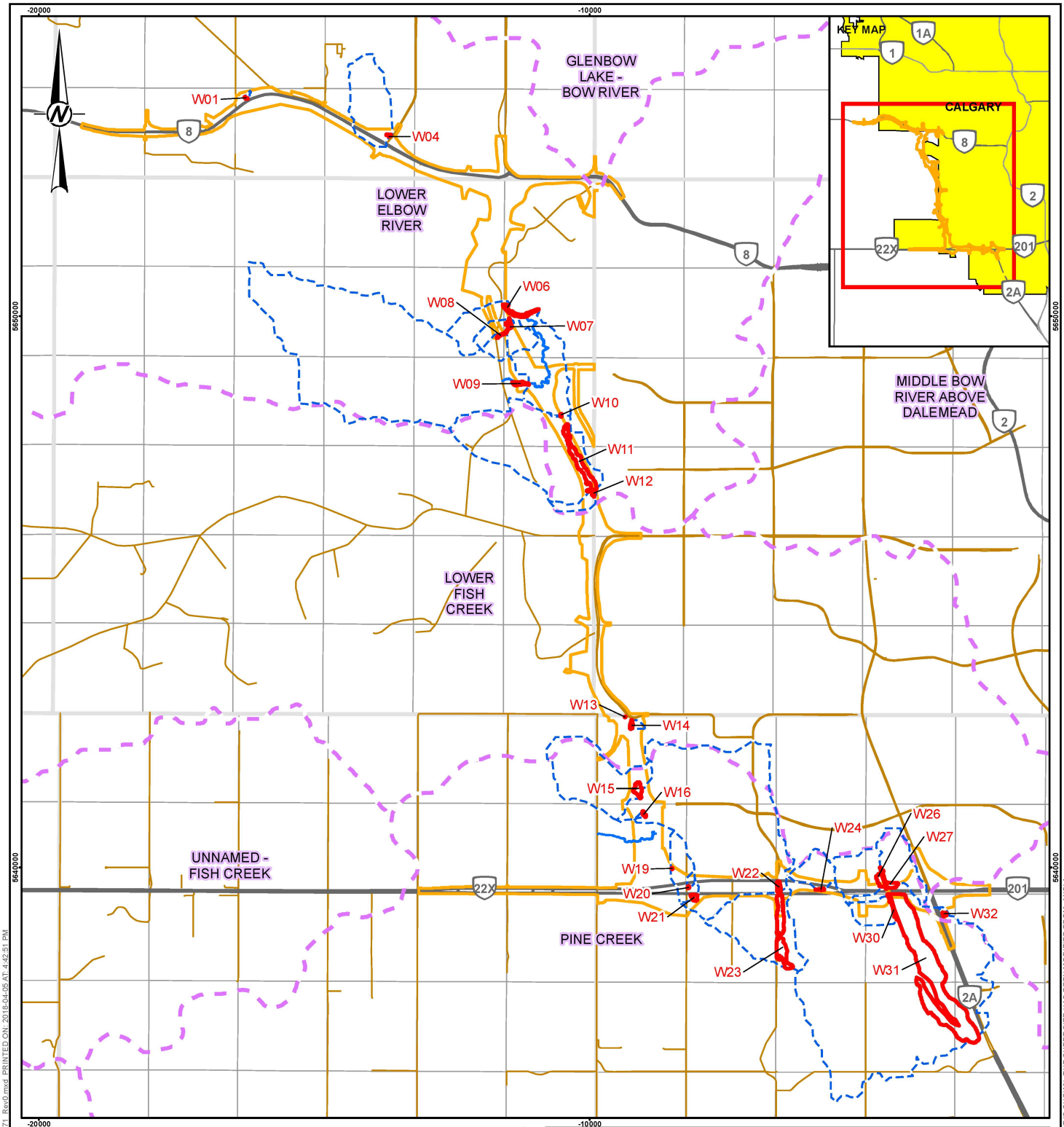
2) a calculation of the required wetland compensation based on the 2013 Wetland Policy directives; and

3) specific proposals for avoidance and mitigation, if possible, of Wetland W07 (identified in 00388473-P003) and Wetland W08 (identified in 00388473-F003).

The Applicant Holder (KGL) is required to submit applications for wetland impacts based on the wetland regulatory requirements including the ABWRET-A tool (Alberta Environment and Sustainable Resource Development [AESRD] 2015) and the current directives and guidelines (GOA 2015a; GOA 2015b; GOA 2016a; GOA 2016b, GOA 2017a, GOA 2017b) for the 24 previously assessed wetlands where impacts were anticipated (W04, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W19, W20, W21, W22, W23, W24, W26, W27, W30, W32, W32). Of the 24 assessed wetlands, 14 wetlands totalling 18.65 ha will be fully impacted, eight wetlands totalling 3.80 ha will be partially impacted, and one wetland (i.e., W06) will be completely avoided based on updated Project planning (Figure 2A to 2P). The total impacted wetland area will be 22.45 ha.

This WAIR has been prepared using previous field assessment information from the WIA (Golder 2016a, CH2M 2016a), desktop analysis including extensive current and historical aerial photography, and the Environmental Evaluation (EE) for the SWCRR (AMEC 2014). The WAIR demonstrates the proponent followed the wetland mitigation hierarchy (GOA 2013a) including:

- avoidance – the primary and preferred response is to avoid wetland impacts;
- minimization – where avoidance is not possible, proponents are expected to minimize impacts; and
- replacement (i.e., compensation) – as a last resort, and where avoidance and minimization efforts are not feasible or prove ineffective, wetland replacement is required.



LEGEND

- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- WATERSHED SUB-BASIN (AEP HUC 10)
- 2018 WAIR ASSESSED WETLAND
- WETLAND CATCHMENT (GOLDER)
- WATERCOURSE (GOLDER)
- RIGHT-OF-WAY

0 2 4
1:100,000 KILOMETRES

NOTE(S)

DISCREPANCIES BETWEEN THE WATERSHEDS AND WETLAND CATCHMENTS MAY BE RESULT OF DIFFERING SOURCE DATA. WETLANDS CATCHMENTS WERE DERIVED BY GOLDER FROM ALTALIS 1:20,000 DIGITAL ELEVATION MODEL AND ARE MORE GENERALIZED COMPARED TO THE DETAIL OF THE AEP HUC 10 WATERSHED DATA.

REFERENCE(S)

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PROJECTION: 3TM 114 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
PROJECT SITE OVERVIEW AND WETLAND LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	AA
REVIEWED	JT
APPROVED	CRM

PROJECT NO.	CONTROL	REV.	FIGURE
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693500
694000
694500
695000
5656500
5656000
5655500
5655000

W01
Temporary (Class II)
Graminoid Marsh

May Creek

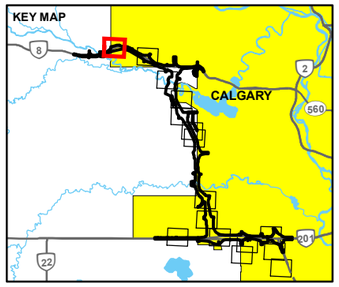
Elbow River

1 2 3 4 9 10 11 12 13 14 15 16

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

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696000
696500
697000
697500
5685500
5685000
5684500

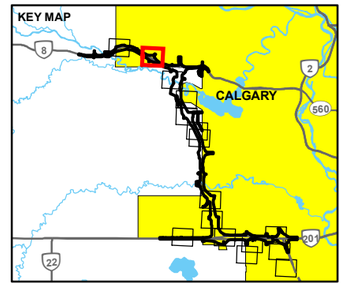
SEC-03
TWP-024
RGE-02 MER-5

W04
Seasonal (Class III)
Wooded Deciduous Swamp

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

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699000
699500
700000
5652500
5652000
5651500

Elbow River

W06
Permanent (Class V)
Shallow Open Water

W07
Seasonal (Class III)
Shrubby Swamp

W08
Seasonal (Class III)
Graminoid Marsh

WC01
Watercourse

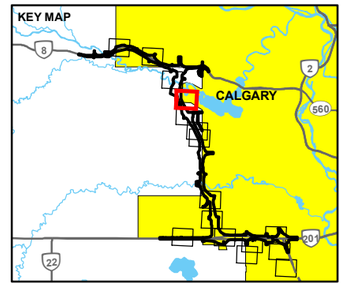
SEC-25
TWP-023
RCE-02 MER-5

9 12 11 10 15
8 5 6 7
1 4 3 2

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

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699000
699500
700000
5651500
5651000
5650500

WC01
Watercourse

W09
Seasonal (Class III)
Graminoid Marsh

W10
Seasonal (Class III)
Graminoid Marsh

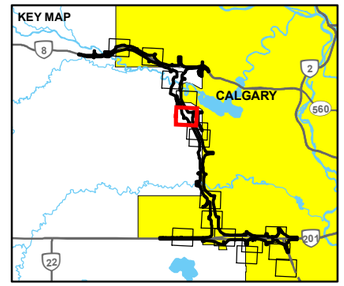
SEC-24
TWP-023
RGE-02 MER-5

16 13 14 15
9 12 11 10
8 5 6 7

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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PROJECT
SOUTHWEST CALGARY RING ROAD

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CONSULTANT GOLDER

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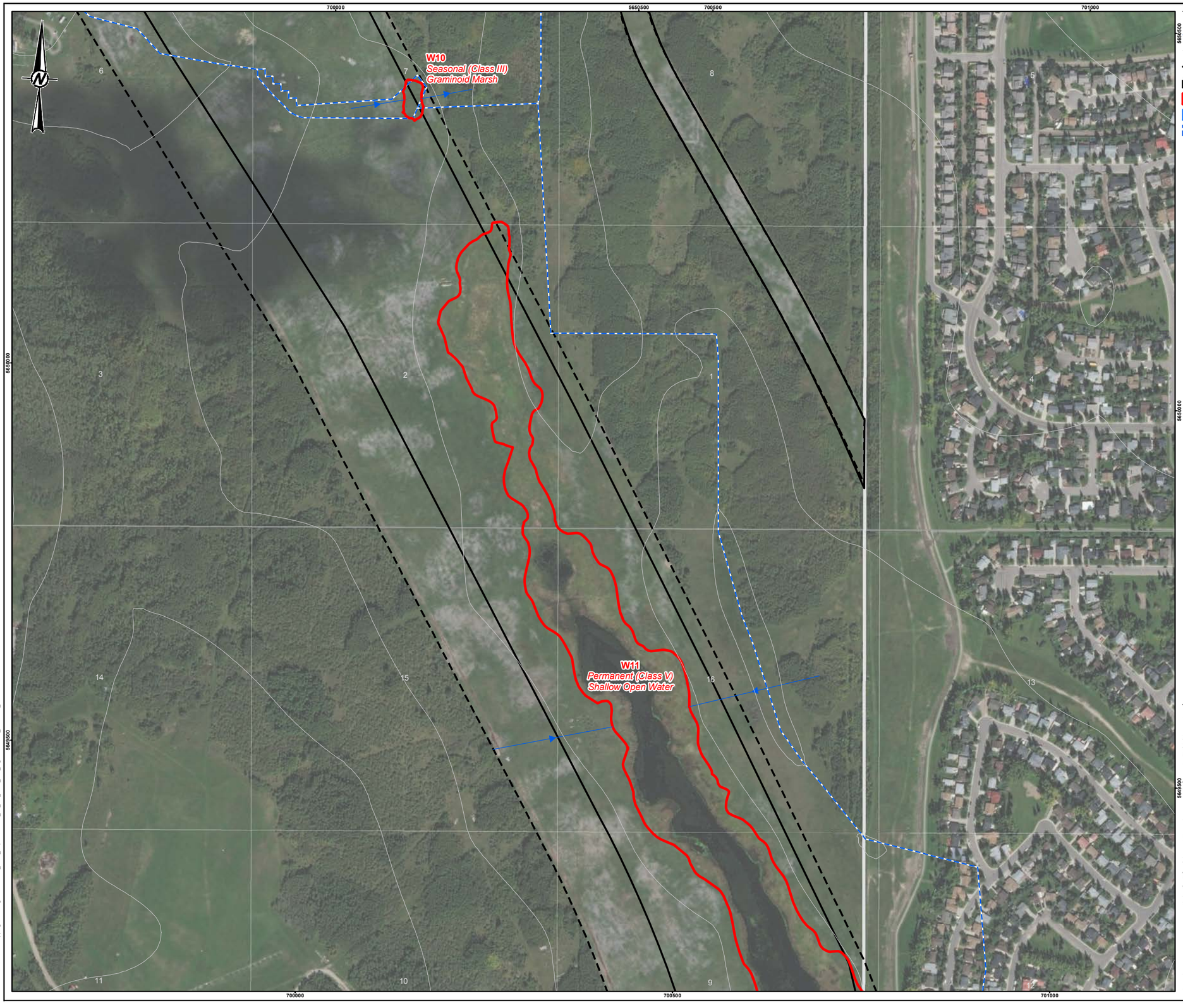
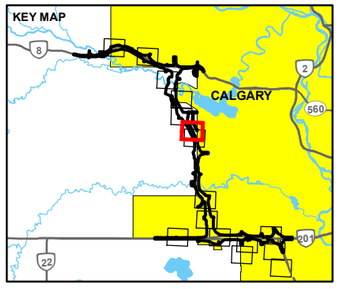


LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)



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700000
700500
701000
5650000
5649500
5649000

W11
Permanent (Class V)
Shallow Open Water

W12
Seasonal (Class III)
Graminoid Marsh

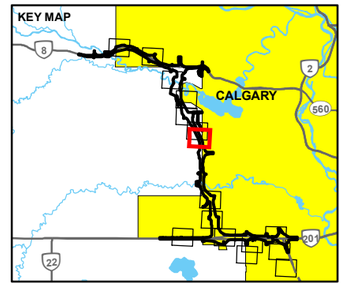
SEC-13
TWP-023
RGE-02 MER-5

15
16
13
10
9
12
7
8
5

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT
GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
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0 25mm

701000
701500
702000
5645000
5644500

W13
Seasonal (Class III)
Graminoid Marsh

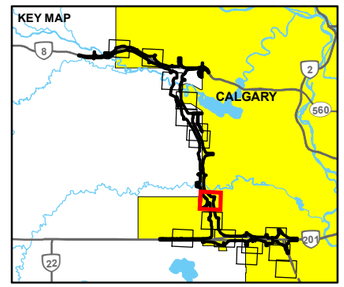
W14
Temporary (Class II)
Graminoid Marsh

SEC-31
TWP-022
RGE-01 MER-5

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT
GOLDER

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REVIEWED	JT
APPROVED	CRM

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701500
702000
702500
5643500
5643000

W15
Semi-permanent (Class IV)
Shallow Open Water

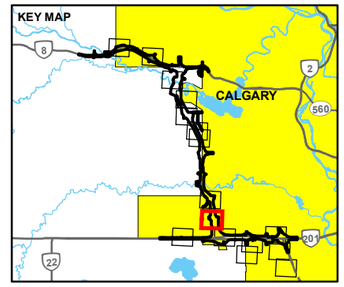
W16
Temporary (Class II)
Graminoid Marsh

WC02
Watercourse

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 | REV. 0 | FIGURE 2H

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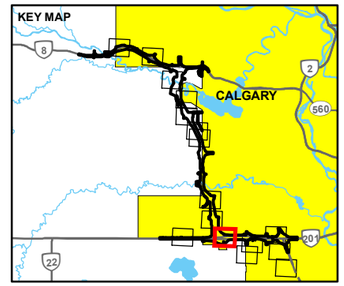
LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)



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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 REV. 0 FIGURE 2I

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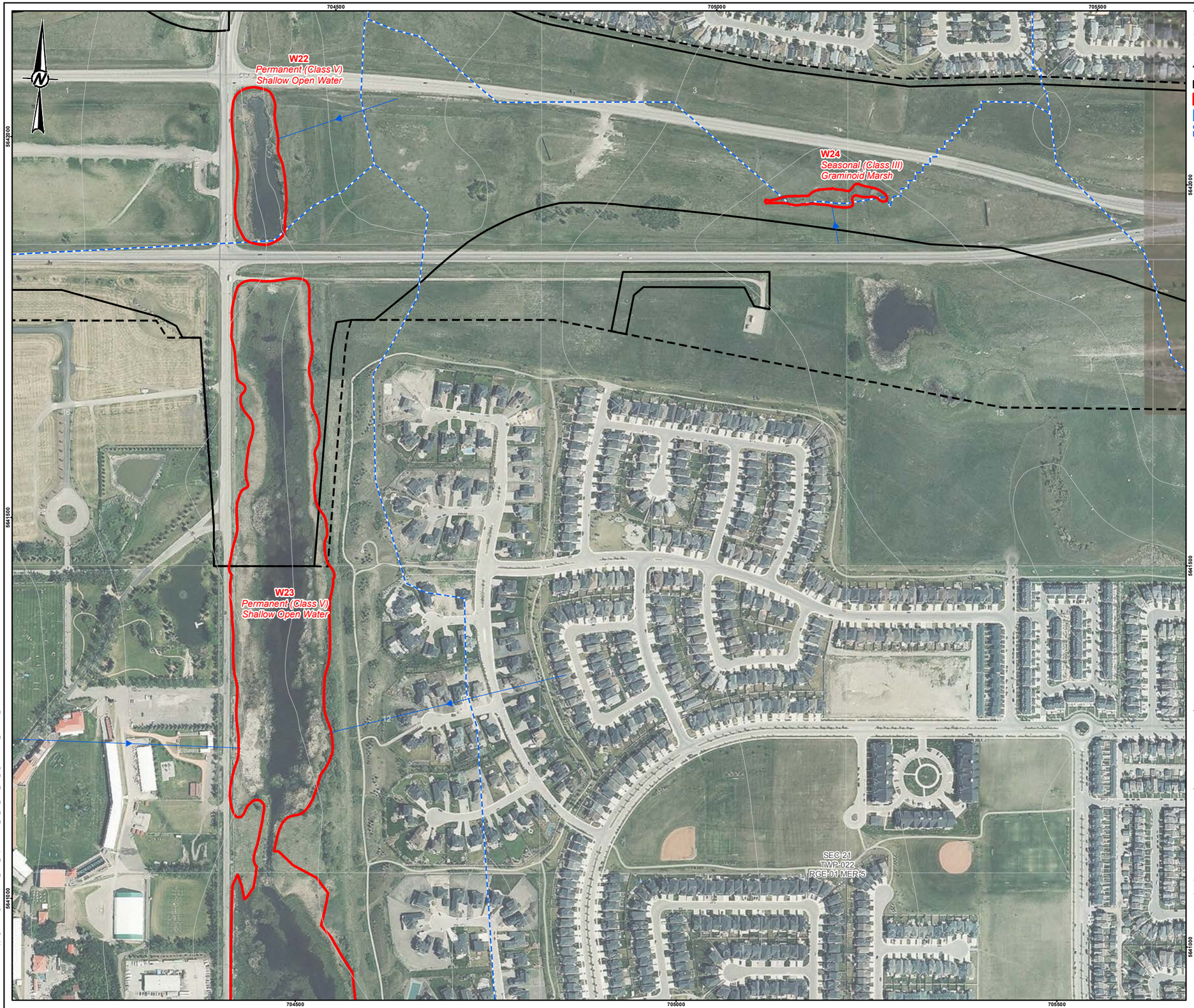
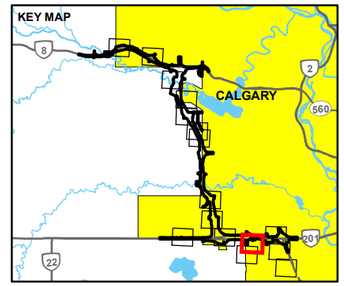


LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)



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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 REV. 0 FIGURE 2J

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25mm

0

704000
704500
705000
5641000
5640500

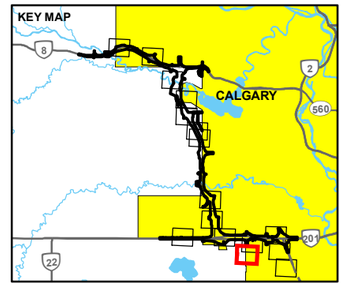
W23
Permanent (Class V)
Shallow Open Water

SEC-21
TWP-022
RGE-01 MER-5

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 REV. 0 FIGURE 2K

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0 25mm

706000
706500
707000
5642500
5642000

SEC-27
TWP-022
RGE-01 MER-5

W26
Permanent (Class V)
Shallow Open Water

W27
Permanent (Class V)
Shallow Open Water

W30
Seasonal (Class III)
Wooded Deciduous Swamp

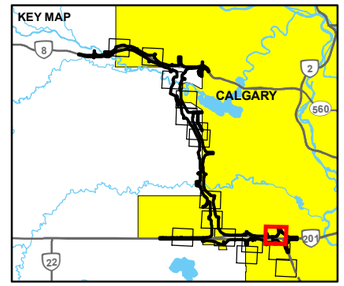
W31
Permanent (Class V)
Shallow Open Water

W32
Seasonal (Class III)
Graminoid Marsh

LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)

KEY MAP



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1. ALBERTA MERGED WETLAND INVENTORY OBTAINED FROM ALBERTA ENVIRONMENT AND PARKS (AEP), INFORMATICS BRANCH 20141029.
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KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT
GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 REV. 0 FIGURE 2L

25mm
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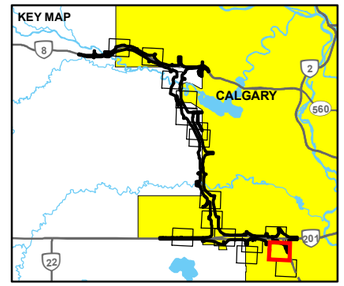
LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)



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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
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CONSULTANT GOLDER

YYYY-MM-DD	2018-04-05
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REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 REV. 0 FIGURE 2M

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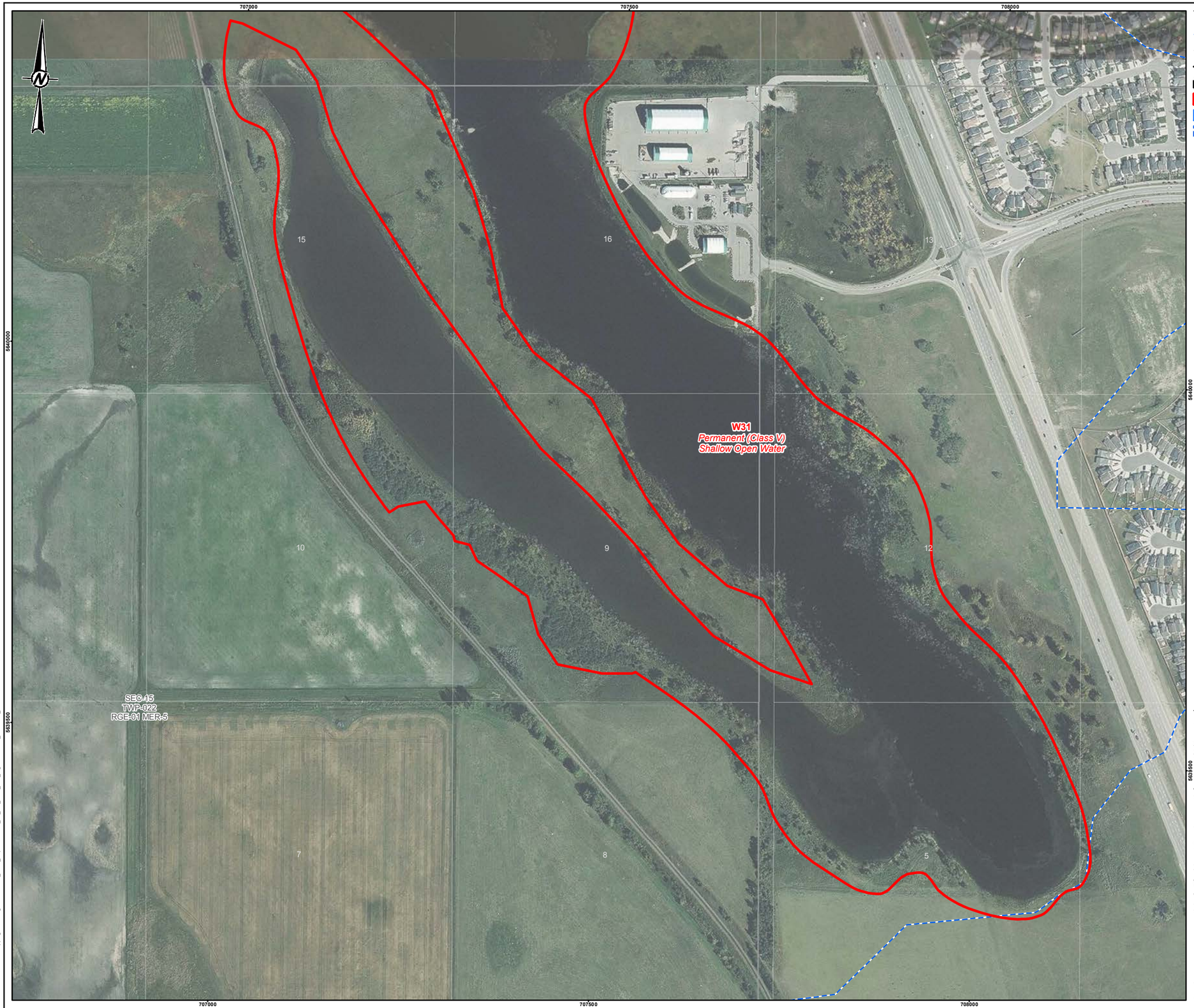
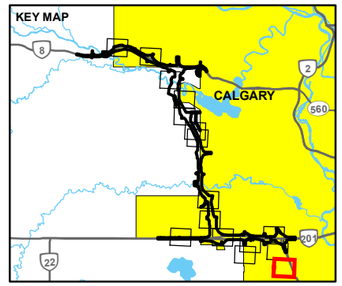


LEGEND

- SURFACE FLOW DIRECTION
- CONTOUR (5 m)
- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- 2018 WAIR ASSESSED WETLAND
- WATERCOURSE (GOLDER)
- WETLAND CATCHMENT (GOLDER)



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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
WAIR ASSESSED WETLANDS AND THEIR SURFICIAL HYDROLOGY

CONSULTANT GOLDER

YYYY-MM-DD	2018-04-05
DESIGNED	KW
PREPARED	BDW/LMS
REVIEWED	JT
APPROVED	CRM

PROJECT NO. 1789100 REV. 0 FIGURE 2N

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2.0 ASSESSMENT METHODS

Golder completed an initial desktop review of the 24 wetlands as required under the Alberta Wetland Assessment and Impact Report Directive (GOA 2017A). At the time of this report, several wetlands within the Project Site have been disturbed under the original Approval (*Water Act* Approval Number 00388473-00-00). A detailed review of the field information collected for the WIA, desktop analysis including examination of extensive current and historical aerial photography, and information in the EE (AMEC 2014) were used to populate the Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A) forms for this assessment. Pathway 5 in the *Alberta Wetland Identification and Delineation Directive* was selected to identify and delineate wetlands because the wetland boundaries are complex and indistinct in the historical and current aerial photographs, and some wetland areas within the Project have been disturbed due to livestock grazing, other agricultural activities, and urban development (GOA 2015a).

2.1 Desktop Review

2.1.1 Desktop Searches

A desktop assessment of the natural and anthropogenic landscape features in the local watershed(s) for the Project Site was completed prior to performing the field surveys for the WIA (Golder 2016a). The assessment results have not been updated because they reflect the current information during the 2016 field surveys. The desktop review for special designations or environmental sensitivities within the Project was completed using the following resources:

- the Historical Resource Value for the Project Site (Alberta Culture and Tourism 2017) was assessed to determine whether historic resources were present or if there is a high potential for their presence, including archaeological, paleontological, historical, natural and cultural resources;
- the Disposition Spatial Processing Tool (DSPT) (AEP 2015a) was used to determine any previous industrial surface activities within the Project Site;
- the Alberta Conservation Information Management System (ACIMS) on-line database (AEP 2016a) for historical occurrences of listed provincial plant species or sensitive ecological communities;
- the Fish and Wildlife Management Information System (FWMIS) (AEP 2016b) for historical occurrences of listed fish and wildlife species;
- fisheries and wildlife sensitivity mapping layers (AEP 2016c) were referenced to determine if any layers (i.e., key wildlife and biodiversity zones, special access zones, locations of sensitive wildlife and/or vegetation features) intersect the Project Site,
- the AgroClimatic Information Service of Agriculture and Rural Development (Alberta Agriculture and Forestry [AAF] 2016) for local climate data; and
- AEP's river basin database (AEP 2015b) and the United States Geological Service (USGS) Digital Elevation Model (DEM) data files to determine the catchment area for the wetland basins associated with the Project Site.

2.1.2 Desktop Delineation

A comprehensive remote wetland inventory of the Project Site was initially performed to identify and delineate wetlands in historical and recent aerial photographs, as outlined in the *Alberta Wetland Identification and Delineation Directive* (GOA 2015b). Topographic maps were used in combination with the historical aerial photographs to assess drainage patterns and identify and delineate potential wetlands within the Project.

2.1.3 Historical Aerial Photograph Review

A review of historical aerial photographs of the Project was completed by obtaining aerial photographs for selected years from AEP's Aerial Photographic Record System (AEP 2016d). Aerial photographs from 1920 to the present were reviewed and successive photos were acquired based on clarity and to show changes over approximately 10 year intervals. Historical climatic data, obtained from the AgroClimatic Information Service (AAF 2016), was also used to help select the best available years for the historical aerial photograph review. A total of sixteen years (1920, 1926, 1949, 1962, 1966, 1974, 1976, 1977, 1982, 1983, 1984, 1993, 1998, 1999, 2005, and 2008) were selected for the historical air photograph review. Multiple years were included for decades where imagery was poor or coverage was inadequate (i.e., 1920s, 1960s, 1970s, 1980s and 2000s). Historical photographs and associated historical wetland boundary delineations are included in Appendix B.

2.2 Wetland Field Surveys

Initial wetland field surveys for the Project were completed by Julie Koloff, a Professional Biologist with CH2M, between June 6 and June 18, 2016 (CH2M 2016b). Supplemental wetland surveys were completed between October 17 and 21, 2016 by Chris Shapka, a Professional Biologist with Golder. A summary of wetland field surveys by each consulting firm is provided in Table 1. The photographs taken during the field surveys have been provided in Appendix C.

For this updated assessment, wetlands have been classified using the Alberta Wetland Classification System (AWCS) (AESRD 2015). Field data collected by CH2M satisfied the requirements of both the Interim and 2013 Wetland Policy directives (Alberta Environment [AENV] 2007, GOA 2017a). However, field data collected by Golder was collected consistent with direction under the Interim Wetland Policy (AENV 2007) and therefore required professional judgement to determine or estimate the biological attributes where direct field data was not available to meet the requirements of the assessment process under the 2013 Wetland Policy. During the 2016 field surveys, wetlands were delineated and observations were made regarding surface water presence, water movement, water depth, signs of groundwater influence, and substrate composition.

Vegetation survey plots were established in locations representative of the dominant vegetation strata (i.e. graminoid or shrubby) and relation to the size of the wetland (i.e., multiple plots in larger wetlands). Surveys within graminoid dominated strata were based on a 1 metre (m) x 1 m plot size, while shrubby dominated (or higher) strata used a 10 m x 10 m plot size. Where possible, soils profile descriptions and soil characteristics from the upper 30 centimetres (cm) horizon were collected including the presence or absence of mottles, topsoil depth, colour, and textures in accordance with the Canadian System of Soil Classification (Soil Classification Working Group 1998). Dominant vegetation was recorded, habitat features were identified, and incidental wildlife or wildlife sign observations were documented. Each wetland was georeferenced using a hand-held Global Positioning System (GPS). Photographs were taken during the field surveys and are provided in Appendix C. A track file was recorded using a GPS to delineate each wetland perimeter and generate area summaries using a Geographical Information System (GIS).

Table 1: Summary of Wetland Field Survey Work by Consultant and Date of Assessment

Consultant	Wetland ID	Date of Field Assessment	Latitude	Longitude
CH2M	W04	6/11/2016	51.015695	114.194515
	W08	6/13/2017	50.983120	114.165401
	W11	6/12/2016	50.962871	114.144990
	W12	6/12/2016	50.957327	114.141369
	W20	6/17/2016	50.893191	114.116699
	W21	6/17/2016	50.891503	114.115211
	W22	6/13/2017	50.893202	114.093372
	W23	6/13/2017	50.885748	114.092220
	W26	6/10/2016	50.894241	114.066948
	W27	6/10/2016	50.894375	114.064862
	W30	6/10/2016	50.889925	114.063974
	W31	6/10/2016	50.879528	114.053503
	W32	6/10/2016	50.888798	114.050621
Golder	W01	10/20/2016	51.021753	114.231493
	W06	10/19/2016	50.987021	114.160671
	W07	10/19/2016	50.984729	114.163460
	W09	10/20/2016	50.975294	114.160295
	W10	10/21/2016	50.970124	114.149818
	W13	10/17/2016	50.920917	114.133108
	W14	10/17/2016	50.919621	114.131492
	W15	10/18/2016	50.909012	114.129793
	W16	10/17/2016	50.905125	114.128179
	W19	10/19/2016	50.896201	114.120945
	W24	10/19/2016	50.892870	114.082711

2.3 Wetland Post-Field Desktop Assessment

Wetland catchment areas were delineated based on a Geographical Information System (GIS) analysis of topographic data using the AltaLIS 1:20,000 Digital Elevation Model (DEM) (GOA 2014a) to delineate sinks (depression areas) and assess flow direction as of the date of this report.

The ABWRET-A form (GOA 2015b) was completed for each impacted wetland based on the previous field survey data, desktop analysis and Professional Biologist judgement. The relative wetland value scores were received from AEP on March 20, 2018.

2.4 Assessment Results

2.4.1 Desktop Searches

The review of the Alberta Township Systems and Hydrography Data (GOA 2016b) shows the Project Site spans three South Saskatchewan watershed sub-basins including Lower Elbow, Lower Fish Creek, and Pine Creek. Figure 1 shows the watershed basins and the wetland catchment areas for each wetland.

The Project Site is located within the Foothills Parkland Subregion of the Parkland Natural Region (Natural Regions Committee 2006). Natural areas within the Foothills Parkland Subregion predominantly comprise rolling to hilly grasslands on southerly exposures and aspen (*Populus tremuloides*) woodlands or willow (*Salix* spp.) shrublands on northerly slopes or low-lying areas (Natural Regions Committee 2006). Riparian areas along major rivers are characterized by stands of balsam poplar (*Populus balsamifera*), plains cottonwood (*Populus deltoides*) and aspen with shrubby understories, while poorly drained depressions and tributaries are characterized by willow, sedges (*Carex* sp.), and tufted hair grass (*Deschampsia cespitosa*) communities. More than 60 percent of the Foothills Parkland Subregion is used as native or improved pasture, with some other less frequent agricultural activities, primarily in the form of hay or feed grain (Natural Regions Committee 2006).

At the time of the initial assessment in 2016, there were no *Water Act* or *EPEA* approvals listed under the AER (Alberta Energy Regulator) and AEP Authorization Viewer (AER 2015). There were no industrial surface activities within the Project Site listed under the Disposition Spatial Processing Tool (DSPT) (AEP 2015a). This assessment represents conditions at the time of the field analysis and corresponding desktop work in 2016.

All Project wetlands fall within the prairie falcon (*Falco mexicanus*), golden eagle (*Aquila chrysaetos*), and bald eagle (*Haliaeetus leucocephalus*) sensitive raptor ranges (AEP 2015c). Wetlands W05, W06 and W07 fall within a Key Wildlife Biodiversity Zone based on their proximity to the Elbow River valley (AEP 2015d).

Of the 24 assessed wetlands in the Project Site, 23 have notations in the *Listing of Historic Resources*, a provincial document that identifies the predetermined Historic Resources Values (HRV) for a given parcel of land based on previously identified historic resource locations (Alberta Culture and Tourism 2017). The presence of 4a, 5a, 4p, 5p, and 4c HRV notations in these lands indicate that they have a high potential for the presence of archaeological, paleontological, historical, and cultural resources. Notations with a suffix of “a” relate to archaeological sites, those with a suffix of “p” relate to palaeontological sites, and those with a suffix of “c” pertain to cultural sites. Land parcels with a HRV of 4 indicate that previously reported historic sites exist which require additional studies or avoidance of the defined site polygons. Of particular concern are those lands with HRV 4c notations; these lands may require consultation with First Nation groups to avoid the identified aboriginal traditional use sites. Lands with HRV values of 5, indicate high potential areas to contain previously unreported historic resources. The summary of wetlands and HRVs found in each legal land description is provided in Table 2 below.

Table 2: Summary of Historical Resource Values for Assessed Wetlands

Legal Land Description	Wetland Identification	Historical Resource Value [(a)]
22-1-W5M	W13, W14, W15, W16, W19, W20, W21, W22, W23, W24, W26, W27, W30, W31	4a, 5a
23-1-W5M	W11, W12	4c, 4p, 5p
23-2-W5M	W06, W07, W08, W09, W10, W11, W12	4a, 4c, 4p, 5a, 5p
24-2-W5M	W01, W04	4a, 5a

(a) Alberta Culture and Tourism 2017

2.4.1.1 Vegetation

An ACIMS database search (ACIMS 2015) was performed by Golder on September 27, 2016 and October 27, 2016 to help determine the potential for listed plant species within the Project Area. The ACIMS search yielded seven listed plants (including vascular and non-vascular species) within a 3 km buffer of Project wetlands. Table 3 shows each species and its provincial rank, ACIMS Tracked and Watched status, and the associated wetland(s). None of the recorded plant species are federally listed under the *Species at Risk Act* (SARA). This list, however, does not preclude the potential for additional listed plant species to be present, as listed plants are often associated with wetlands and can be difficult to detect. Appendix D includes the ACIMS ranking definitions and Appendix E provides the ACIMS search results.

Table 3: ACIMS Database Search Results for Listed Plants Based on a 3 Kilometre Buffer for Each Wetland

Scientific Name	Common Name	S Rank[(a)]	G Rank[(a)]	Tracked / Watched	Wetlands Associated with Observation
Vascular Plants					
Lithospermum occidentale (synonym: *Onosmodium molle*)	western false gromwell	S3	G4G5	T	W01[(b)], W22, W23, W24, W26, W27, W30, W31 and W32.
Ruppia cirrhosa	widgeon-grass	S3	G5	T	W24, W26, W27, W30, W31 and W32.
Non-vascular Plants					
Brachythecium reflexum	cedar moss	S2S3	G5	T	W32.
Drepanocladus brevifolius	brown moss	SU	GNRQ	T	W28 and W32.
Flavopunctelia soredica	powder-edged speckled greenshield lichen	S2S3	G3G5	T	W01 and W04
Rhodobryum ontariense	Ontario Rhodobryum moss	S1S2	G5	T	W13, W14, W15 and W16.
Xanthomendoza montana	sunburst lichen	SUS3	GNR	T	W01

[(a)] ACIMS rare plant ranking definitions are presented in Appendix D.

[(b)] Western false gromwell was documented in the North Borrow Pit Access Road WIA (Golder 2016b), and the occurrence is less than 3 km from W01.

2.4.1.2 Wildlife

A query of the Fish and Wildlife Management Information System (FWMIS) on-line database was performed by Golder on September 28, 2016 and October 27, 2016 and returned 29 species historically observed within a 3 km buffer of Project Site wetlands (AEP 2016b). The results of the search showed a total of 21 bird species with a provincial status of ‘Sensitive’ or higher (Table 4). Of those, five are federal species of concern listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and three species are listed under SARA. The results showed 3 mammals of provincial concern, one amphibian of provincial concern that is also a federally listed species under COSEWIC and SARA, and two reptiles of provincial concern (Table 4).

Table 4 shows each documented species including their provincial, COSEWIC and SARA status, and the associated wetland(s). The absence of other listed wildlife species does not indicate that they are not present in this area though are an indication that very few inventories or surveys have been conducted in the area. Fish species are not included in Table 4 as the minor watercourses (i.e., WC01 and WC02) and wetlands that intersect the Project Area do not likely provide fish habitat. Appendix E provides the FWMIS search results.

Table 4: FWMIS Search Results for the Project Site Based on a 3 Kilometre Buffer For Each Wetland

Scientific Name	Common Name	Provincial Status ACIMS[a]	Federal Status		Wetlands Associated with Observations
			COSEWIC[b]	SARA[c]	
Birds					
Falco sparverius	American kestrel	Sensitive	Not Listed	Not Listed	W13, W14, W15, W16, W19 and W20.
Haliaeetus leucocephalus	bald eagle	Sensitive	Not At Risk	Not Listed	W06, W07, W08, W09 and W10.
Icterus galbula	Baltimore oriole	Sensitive	Not Listed	Not Listed	W06, W07, W08, W09, W10, W30, W31 and W32.
Hirundo rustica	barn swallow	Sensitive	Threatened	Not Listed	W13, W14, W15, W16, W19, W20, W21, W24, W26, W27, W30, W31 and W32.
Strix varia	barred owl	Sensitive	Not Listed	Not Listed	W26, W27 and W32.
Setophaga castanea	bay-breasted warbler	Sensitive	Not Listed	Not Listed	W24, W26, W27, W30, W31 and W32.
Chlidonias niger	black tern	Sensitive	Not At Risk	Not Listed	W19, W20, W21, W22, W23, W24, W26, W27, W30, W31 and W32.
Nycticorax nycticorax	black-crowned night-heron	Sensitive	Not Listed	Not Listed	W22, W23, W24, W26, W27, W28, W29, W30, W31 and W32.
Geothlypis trichas	common yellowthroat	Sensitive	Not Listed	Not Listed	W06, W07, W08, W09, W10 and W31.
Sayornis phoebe	eastern phoebe	Sensitive	Not Listed	Not Listed	W01, W02, W03, W05, W06, W07, W08, W09, W10, W11, and W17.
Ardea herodias	great blue heron	Sensitive	Not Listed	Not Listed	W05, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W18, W19, W20, W22, W23, W24, W26, W27, W28, W29, W30, W31 and W32.
Podiceps auritus	horned grebe	Sensitive	Special Concern	Not Listed	W09, W20, W21, W22, W23, W24, W26, W27, W28, W29, W30, W31 and W32.
Empidonax minimus	least flycatcher	Sensitive	Not Listed	Not Listed	W06, W07, W08, W09, W10, W11, W13, W14, W15, W30, W31 and W32.
Contopus cooperi	olive-sided flycatcher	May be at Risk	Threatened	Threatened	W06, W07, W09, W10, W11 and W12.
Pandion haliaetus	osprey	Sensitive	Not Listed	Not Listed	W06, W07, W08, W22, W23, W24, W26, W27, W30, W31 and W32.
Falco mexicanus	prairie falcon	Sensitive	Not Listed	Not Listed	W13 and W14.
Falco peregrinus	peregrine falcon	At Risk	Special Concern	Schedule 1 Special Concern	W13, W14, W26, W27, W30, W31 and W32.
Podilymbus podiceps	pied-billed grebe	Sensitive	Not Listed	Not Listed	W05, W06, W07, W08, W09, W10, W11, W12, W20, W21, W22, W23, W24, W26, W27, W30, W28, W29, W31 and W32.
Dryocopus pileatus	pileated woodpecker	Sensitive	Not Listed	Not Listed	W01, W02, W03, W05, W06, W07, W08 and W10.
Porzana carolina	sora	Sensitive	Not Listed	Not Listed	W01, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W19, W20, W21, W22, W23, W24, W26, W27, W30, W31 and W32.
Piranga ludoviciana	western tanager	Sensitive	Not Listed	Not Listed	W09, W10, W11 and W12.
Mammals					
Lynx rufus	bobcat	Sensitive	Not Listed	Not Listed	W01, W06, W07, W09, W10, W11, W12, W13, W14, W15 and W16.
Felis concolor	cougar	Secure	Not Listed	Not Listed	W06, W07, W08, W09, W10, W14, W15, W16, W22, W23, W24, W26, W27, W30 and W32.
Mustela frenata	long-tailed weasel	May Be at Risk	Not At Risk	Not Listed	W13, W14, W15, W16, W19, W26, W27, W30, W31 and W32.
Lasiurus borealis	red bat	Sensitive	Not Listed	Not Listed	W09, W10, W11 and W12.
Lasionycteris noctivagans	silver-haired bat	Sensitive	Not Listed	Not Listed	W13, W14, W15 and W32.
Amphibian and Reptiles					
Lithobates pipiens	northern leopard frog	At Risk	Special Concern	Schedule 1 Endangered	W22, W23, W24, W26, W27, W30, W31 and W32.
Thamnophis sirtalis	red-sided garter snake	Sensitive	Not Listed	Not Listed	W06, W07, W09, W10, W11 and W12.
Thamnophis elegans	wandering garter snake	Sensitive	Not Listed	Not Listed	W06, W07, W09, W10 and W11.

[a] Alberta Conservation Information Systems 2015

[b] COSEWIC – Committee on the Status of Endangered Wildlife in Canada.

[c] SARA – Species at Risk Act; Government of Canada 2016.

2.4.2 Desktop Delineation

2.4.2.1 Historical Aerial Photograph Review

Historical aerial photographs from 1920, 1926, 1950, 1962, 1966, 1974, 1976, 1977, 1982, 1983, 1984, 1993, 1998, 1999, 2005, and 2008 were reviewed to assess changes to wetlands located within the Project Site over time. Historical photographs are presented by the decade in Appendix B and the descriptions of changes to wetlands over time are presented in Appendix F. The majority of the assessed wetlands within the Project Site have been present on the landscape for at least 90 years. However, historical photos show dynamic changes in wetland basin boundaries over the years due to wetland connectivity through natural drainages, annual variation in precipitation, and agricultural practices at the Project Site. The following section provides a description of the land use and wetland permanence relative to climatic data (where available). A more detailed interpretation of the historical wetland characteristics for each aerial photograph is provided in Appendix F.

1920s: Historical aerial photographs indicate the land use in the 1920s was predominantly agricultural, particularly livestock grazing. Agricultural activities occurred primarily in the southern and northern areas along the present-day Highway 22X and Highway 8 alignments. Similarly, the road and rural residential developments are also more concentrated along the Highway alignments. The centre portion of the Project Site, formerly part of Tsuu T'ina Nation (TTN) reserve, indicates there is some agricultural activity including livestock grazing, however, it predominantly remains in a natural state with large patches of undisturbed native vegetation. Access roads within this area are less defined than the southern and northern areas. The majority of the wetlands are present in the photos with the exception of W09. Climate data is not available for this decade.

1950s: Historical aerial photographs show an increase in road development in 1950, in particular Highway 22X, Highway 8, and surrounding rural residential roads in the south and north portions appear more defined. The Glenmore Reservoir was built in the 1930's and this may have influenced some of the oxbow wetlands surrounding the Project Site, however, the overall land use appears similar to the 1920s. Agricultural development has continued and expanded in most areas. No apparent changes have occurred in the centre portion of the Project Site. With the exception of W09, all wetlands were present in the 1950s. Although, climate data was not available for this decade, the visible reduction in size of most wetlands suggest it is drier than normal conditions.

1960s: Agricultural activity continues to be the dominant land use in the 1960s, however, livestock activities appear less intense than during previous years. Anthropogenic disturbances were visible in the north-central portion of the TTN reserve north of the Elbow River. These disturbances are presumed to be from military activity when portions of the reservation were leased as the Harvey Barracks to the Department of National Defence for training and artillery use by the Canadian Army between 1908 and 1990 (Government of Canada 2004). In addition, defined access roads have been developed throughout the TTN reserve. In general, wetlands appear reduced in size and with less visible open water. All of the wetlands, with the exception of W01 and W02, were visible in the 1962 and 1966 aerial photographs. Climate data show the annual precipitation was drier than normal in 1962 and normal in 1966.

1970s: Agricultural activity continues to be the dominant land use in the 1970s. Increased urbanization has occurred in the central portion of the alignment, east of the TTN reserve. All of the wetlands were visible in the 1974, 1976 and 1977 aerial photographs. In general, most wetlands appear similar in size to the previous decade, however, minimal changes in the wetlands appear to be associated with increased agriculture and urbanization, and to a lesser extent climatic variation. Climate data show the annual precipitation was drier than normal in 1974 and normal in 1976 and 1977.

1980s: Agricultural activity continues to be the dominant land use in the 1980s. Increased urbanization has occurred in the central portion of the project Site, east of the TTN reserve. All of the wetlands with the exception of W19 were visible between the 1982, 1983 and 1984 aerial photographs. In general, most wetlands appear similar in size to the previous decade, however, the minimal changes in the wetlands appear to be associated with increased agriculture and urbanization, and to a lesser extent climatic variation. Climate data show the annual precipitation was normal in 1982, dry in 1983, and normal in 1984.

1990s: Agricultural activity continues to be the dominant land use in the 1990s. Increased urbanization has occurred in the northern and southern portions. In general, most wetlands appear to have undergone various anthropogenic disturbances, but are similar to or larger in size to the previous decade. All of the wetlands with exception of W19 were visible in the 1993, 1998 and 1999 aerial photographs. Climate data show the annual precipitation was wetter than normal in 1993 and 1998, and normal in 1999.

2000s: Almost all of the adjacent areas along Highway 8 are urbanized. Similarly, the eastern portion of Highway 22X is extensively urbanized. The central portion of the Project Site predominantly remains in a naturalized state with large patches of undisturbed native vegetation. All of the wetlands were visible in the 2005 and 2008 aerial photographs. Climate data show the annual precipitation was wetter than normal in 2005 and 2008. This corresponds to the general wetland size and extent, which appear wetter and generally larger than during previous decades.

Detailed descriptions of the changes in landscape conditions and specific wetland characteristics in the Project Site are summarized for each historical photograph in Appendix F. A description of the AWCS definitions (AWCS 2015) is provided in Appendix G

2.5 Current Classification and Delineation

2.5.1 Wetland Vegetation and Classification

Current aerial photo interpretation, in combination with GIS analysis, was used to calculate the current area of the wetlands (Figure 1). A total of 24 potentially impacted wetlands were delineated and classified within the Project Site. Photo documentation of the wetlands is provided in Appendix C. Alberta Wetland Classification System (AWCS 2015) definitions are provided in Appendix G. Table 5 shows the current classification of the wetlands and associated vegetation indicator species observed during the 2016 field surveys performed by CH2M and Golder.

The most frequently occurring wetland types were Marsh-Graminoid–II (Temporary) and Marsh Graminoid-III (Seasonal) and with six and seven occurrences, respectively. Shallow Open Water–Aquatic Vegetation-IV (Semi-permanent) and Shallow Open Water–Aquatic Vegetation-V (Permanent) wetlands occurred twice and six times, respectively. Swamp-Wooded Deciduous-III (Seasonal) and Swamp–Shrubby-III (Seasonal) wetlands occurred twice and once, respectively.

Soils at the Project Site are dominated by Orthic Black Chernozems on medium or fine textured till, Black Solodized Solonetz on medium textured till and Rego Humic Gleysol on fine to moderately fine texture till (Alberta Soil Information Centre 2001). Wetland areas have poorly drained soils with fine texture. Soils information collected during the 2016 field surveys is provided in Table 5. Soil surveys were performed by AMEC for the EA (2014) and the results have been included in Appendix H.

Table 5: Summary of Wetland Classes, Indicator Species and Soil Characteristics Observed During the 2016 Field Surveys

Wetland Class (AWCS)[a]	Wetlands per Classification (AWCS)	Stratum (Ground, Shrub, Tree)	Plot Technique (m)	Vegetation Species	Obligate Wetland Indicator Species Present (Y/N)	Percent Cover (%)[b]	Soils
Marsh-Graminoid-II (Temporary) (M-G-II)	W01	G	*1 x 1*	sedge sp., thistle species (*Cirsium* sp.), reed canary grass (*Phalaris arundinacea*), Nuttall's salt-meadow grass (*Puccinellia nuttalliana*), western dock (*Rumex occidentalis*),stinkweed (*Thlaspi arvense*)	*Y*	*25-50*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W14	G	*1 x 1*	slough grass (*Beckmannia syzigachne*), water sedge (*Carex aquatilis*), wild strawberry (*Fragaria virginiana*), foxtail barley (*Hordeum jubatum*), rush species (*Juncus* sp.), prickly lettuce (*Lactuca serriola*), wild mint (*Mentha arvensis*), timothy (*Phleum pretense*), western dock	*Y*	*5-10*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W16	G	*1 x 1*	common yarrow (*Achillea millefolium*), creeping thistle (*Cirsium arvense*), reed canary grass, common dandelion (*Taraxacum officinale*), clover species (*Trifolium* sp.)	*Y*	*10-25*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W19	G	*1 x 1*	bluejoint (*Calamagrostis canadensis*), water sedge, creeping thistle, lettuce species (*Lactuca* sp.), timothy, western dock, clover species	*Y*	*75-95*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W20	G	*1 x 1*	common cattail (*Typha latifolia*), awned sedge (*Carex atherodes*), reed canary grass	*Y*	*10-15*	Mineral gleying and distinct mottling within 5 cm of soil surface
	W21	G	*1 x 1*	common cattail, awned sedge, water sedge	*Y*	*15-25*	Mineral gleying and distinct mottling within 10 cm of soil surface
Marsh-Graminoid-III (Seasonal) (M-G-III)	W08	S	*10 x 10*	beaked willow (*Salix bebbiana*), red-osier dogwood (*Cornus stolonifera*), bog birch (*Betula glandulosa*)	*Y*	*25-50*	Mineral gleying and distinct mottling within 5 cm of soil surface
	W09	S	*1 x 1*	moss species, water sedge, small bottle sedge (*Carex utriculata*),water-hemlock (*Cicuta maculata*), creeping thistle, swamp horsetail (*Equisetum fluviatile*),Macoun's buttercup (*Ranunculus macounii*), western dock, willow species, goldenrod species (*Solidago* sp.)	*Y*	*25-50*	Mineral gleying and distinct mottling within 5 cm of soil surface
	W10	G	*1 x 1*	sedge species, willow species	*Y*	*50-75*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W12	G	*1 x 1*	wire rush (*Juncus balticus*), fowl bluegrass (*Poa palustris*), common cattail	*Y*	*10-15*	Mineral gleying and distinct mottling within 5 cm of soil surface
	W13	G	*1 x 1*	water sedge, creeping thistle, wild strawberry, foxtail barley, rush species, timothy, common cattail	*Y*	*25-50*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W24	G	*1 x 1*	bluejoint, water sedge, foxtail barley	*Y*	*5-10*	Mineral gleying and distinct mottling within 5 cm of soil surface
	W32		*1 x 1*	tufted hair grass, slender wheatgrass (*Elymus trachycaulus*), slough grass	*Y*	*25-50*	Mineral gleying within 25 cm of soil surface
Shallow Open Water-Aquatic Vegetation-IV (Semi-permanent) (W-A-IV)	W06	G	*10 x 10*	water sedge, wild mint, dock species (*Rumex* sp.), willow species, common cattail	*Y*	*50-75*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed
	W15	G	*1 x 1*	foxtail barley, slough grass	*Y*	*25-50*	Fine textured soil includes slit, glacial, glacial flour, clay, clay loam, silty clay, silty clay loam. No mottles observed

Table 5: Summary of Wetland Classes, Indicator Species and Soil Characteristics Observed During the 2016 Field Surveys

Wetland Class (AWCS)[(a)]	Wetlands per Classification (AWCS)	Stratum (Ground, Shrub, Tree)	Plot Technique (m)	Vegetation Species	Obligate Wetland Indicator Species Present (Y/N)	Percent Cover (%)[(b)]	Soils
Shallow Open Water-Aquatic Vegetation-V (Permanent) (W-A-V)	W11	G	*1 x 1*	small bottle sedge, swamp horsetail, silverweed (*Potentilla anserina*), common mare's-tail (*Hippuris vulgaris*)	*Y*	*50-75*	Mineral gleying and some mottling within 15 cm of soil surface
	W22	G	*1 x 1*	beaked willow *(Salix bebbiana*), dwarf birch (*Betula glandulosa*), red osier dogwood (*Cornus stolonifera*), silverberry (*Elaeagnus commutata*)	*Y*	*10-25*	Mineral gleying and distinct mottling within 20 cm of soil surface
	W23	G	*1 x 1*	beaked willow, bog birch, red-osier dogwood, silverberry (*Elaeagnus commutata*)	Y	10-25	Mineral gleying and distinct mottling within 20 cm of soil surface
	W26	G	*1 x 1*	reed canary grass, turion duckweed (*Lemna turionifera*)	*Y*	*10-25*	Mineral gleying and distinct mottling within 30 cm of soil surface
	W27	S	*1 x 1*	small bottle sedge, wire rush, common cattail, reed canary grass	*Y*	*10-25*	Mineral gleying within 30 cm of soil surface
	W31	G	*1 x 1*	awned sedge, common cattail, giant bur-reed (*Sparganium eurycarpum*), Kentucky bluegrass (*Poa pratensis*)	*Y*	*25-50*	Mineral gleying within 30 cm of soil surface
Swamp-Wooded, Deciduous-III (Seasonal) (S-Wd-III)	W04	S	*10 x 10*	common cattail, great bulrush (*Schnoenoplectus acutus*), reed canary grass	*Y*	*50-75*	Mineral gleying and distinct mottling within 20 cm of soil surface
	W30	S	*10 x 10*	awned sedge, wire rush, green sedge (*Carex viridula*)	*Y*	*10-25*	Mineral gleying within 30 cm of soil surface; gravel present from adjacent road
Swamp-Shrubby-III (Seasonal) (S-S-III)	W07	S	*10 x 10*	aster species *(Symphyotrichum* sp.), brome species (*Bromus* sp.), bluejoint, water sedge, creeping thistle, hemp-nettle (*Galeopsis tetrahit*), wild mint, buttercup species (*Ranunculus* sp.), dewberry (*Rubus pubescens*), water dock, willow species, goldenrod species, common dandelion, common nettle (*Urtica dioica*)	*Y*	*10-25*	Mineral gleying and some mottling within 15 cm of soil surface

(a) Alberta Wetland Classification System (AESRD 2015)
(b) Range in percent cover of facultative and obligate wetland species

2.5.1.1 Wetland Hydrology

Wetland hydrology was assessed through a combination of information collected during the 2016 field surveys, geospatial analysis, and review of current and historical aerial photography. Wetland catchment areas were delineated based on interpretation of the DEM in conjunction with the results of the field investigation and are presented on Figure 1. Table 6 shows the hydrologic information gathered in the field surveys, as well as a description of the hydraulic connectivity and catchment areas. At the time of the October field surveys, standing water was typically not present in wetlands with ephemeral, temporary, and seasonal water permanence. As such, it was not possible to collect some of the hydrology field metrics (i.e., conductivity and pH).

Table 6: Hydrology Information and Evidence Used to Classify Water Permanence of Wetlands

Wetland ID	Wetland Class (AWCS)[a]	Hydrology				Evidence for Classification		Hydraulic Characteristics (standing water, hydrologic driver, connectivity)
		Conductivity (µS/cm)	pH	Surface Water Inflows or Outflows (Y/N) [b]	Catchment Area (ha)	Open Water[c] Present (Y/N)	Water Depth (m)	
W01	M-G-II	Not recorded during the survey	Not recorded during the survey	N	0.74	N	Not recorded during the survey	No open or standing water present. Hydrological drivers: precipitation and surface runoff. Surface water inflow/outflow is not via a channel and may be influenced by Highway 8 as well as grazing and other agricultural practices.
W04	S-Wd-III	Not recorded during the survey	Not recorded during the survey	Y	100.88	N	Not recorded during the survey	No open or standing water present. Hydrological drivers: precipitation and surface runoff, associated with drainage on the west of the wetland. Outlet channel to the east during high water events. Water inflow influenced by Highway 8.
W06	W-A-IV	1406	8.77	Y	174.2	Y	0 to 0.01	Open and standing water present. Oxbow wetland within an isolated, historical Elbow River channel. Hydrological drivers: groundwater discharge, precipitation and surface runoff from W08/W07. Inflow on the southeast and southwest from watercourse WC01 and W07 and W08, respectively. Outflow on the northeast end connects to another oxbow wetland outside the Project Site; Outflow on the southeast end connects to an Elbow River oxbow wetland east of the Project
W07	S-S-III	1186	8.85	Y	40.49	Y	0 to 0.5	Hydrological drivers: precipitation, ground water discharge, and surface runoff. Inflow on the south from W08 and outflow via drainage running north to W06. Wetland drainage altered by vegetation clearing and vehicle traffic observed within the wetland basin. Surface water path observed during field surveys flowing north.
W08	M-G-III	Not recorded during the survey	Not recorded during the survey	Y	15.59	Y	Not recorded during the survey	Standing water present. Hydrological drivers: precipitation, surface runoff, and ground water discharge. Wetland is connected to W07 to the northeast. Inflow and outflow may be influenced by the road to the southeast and previous agricultural impacts.
W09	M-G-III	1222	9	Y	801.75	Y	0 to 0.02	Open and standing water present. Hydrological drivers: precipitation, surface runoff and watercourse WC01. Watercourse WC01 is running east and connects wetland basin to W06. There is hydrological connection between W07, W08 and W09 and they all flow to W06.
W10	M-G-III	Not recorded during the survey	Not recorded during the survey	N	0.52	N	Not recorded during the survey	No open or standing water present. Hydrological drivers: precipitation and surface runoff. No evident connectivity, wetland appears to be hydrologically isolated.
W11	W-A-V	Not recorded during the survey	Not recorded during the survey	Y	286.43	Y	0.5 to 1	Open and standing water present. Hydrological drivers: possibly groundwater discharge, precipitation and surface runoff. It may also receive some stormwater input from the adjacent residential development in the southern portion of the wetland. Hydrologically isolated from wetland W12 by an artificial berm created between 1974 and 1984.
W12	M-G-III	Not recorded during the survey	Not recorded during the survey	N	13.99	N	0 to 0.5	Hydrological drivers: precipitation and surface runoff. Hydrologically isolated from wetland W11 by an artificial berm.
W13	M-G-III	Not recorded during the survey	Not recorded during the survey	N	0.01	N	Not recorded during the survey	Hydrological drivers: precipitation and surface runoff. Wetland drainage has been modified by highway to the north.
W14	M-G-II	Not recorded during the survey	Not recorded during the survey	N	3.26	N	Not recorded during the survey	No open or standing water present. Hydrological drivers: precipitation and surface runoff. Inflow may be influenced by roadway to the north.
W15	W-A-IV	Not recorded during the survey	Not recorded during the survey	N	160.79	Y	Not recorded during the survey	Open and standing water present. Hydrological drivers: possible groundwater discharge, precipitation and surface runoff. Potential connectivity to W16 during wetter seasons through a natural drainage channel.
W16	M-G-II	Not recorded during the survey	Not recorded during the survey	N	1.29	N	Not recorded during the survey	No open or standing water present. Hydrological drivers: precipitation, surface runoff, and historically connected to WC02.Wetland appears to be connected with wetland W15 through a drainage channel to the north.
W19	M-G-II	Not recorded during the survey	Not recorded during the survey	N	0.07	N	Not recorded during the survey	No standing or open water present. Hydrological drivers: precipitation and surface runoff. No evidence of connectivity, temporary wetland located in an isolated depression.
W20	M-G-II	Not recorded during the survey	Not recorded during the survey	N	3.09	N	Not recorded during the survey	No standing or open water present. Hydrological drivers: precipitation and surface runoff. No evidence of connectivity, temporary wetland isolated by highway 22X and 24 St SW.

Table 6: Hydrology Information and Evidence Used to Classify Water Permanence of Wetlands

Wetland ID	Wetland Class (AWCS)[a]	Hydrology				Evidence for Classification		Hydraulic Characteristics (standing water, hydrologic driver, connectivity)
		Conductivity (µS/cm)	pH	Surface Water Inflows or Outflows (Y/N) [b]	Catchment Area (ha)	Open Water[c] Present (Y/N)	Water Depth (m)	
W21	M-G-II	Not recorded during the survey	Not recorded during the survey	Y	40.13	N	Not recorded during the survey	No standing or open water present. Hydrological drivers: precipitation and runoff. Inflow evident from the southeast. Outflow may be influenced by Highway 22X acting as a berm and preventing the water to flow to the north.
W22	W-A-V	Not recorded during the survey	Not recorded during the survey	Y	583.38	Y	0 to 0.5	Open water present. Hydrological drivers: precipitation, runoff and groundwater. Inflow may be influenced by Highway 22X.
W23	W-A-V	Not recorded during the survey	Not recorded during the survey	Y	150.11	Y	0 to 0.5	Open water present. Hydrological drivers: precipitation and runoff. Inflow may be influenced by the north-south road on the west side of the wetland and residential on the east.
W24	M-G-III	3999	8.3	Y	37.04	Y	0 to 0.5	Hydrological drivers: precipitation, surface runoff, and possible stormwater runoff from adjacent highways. Hydrologically connected with antoher wetland via culvert. Wetland hydrology may have been modified by Highway 22X to the north and south.
W26	W-A-V	Not recorded during the survey	Not recorded during the survey	N	65.16	Y	0 to 0.5	Open and standing water present. Hydrological drivers: possible groundwater discharge, precipitation, surface runoff, and stormwater runoff from adjacent roadways and residential development. Hydrologically isolated from wetland W27 due to railway.
W27	W-A-V	Not recorded during the survey	Not recorded during the survey	N	65.45	Y	0 to 0.5	Open and standing water present. Hydrological drivers: possible groundwater discharge, precipitation, surface runoff, and stormwater runoff from adjacent roadways and residential development. Hydrologically isolated from wetland W26 due to railway.
W30	S-Wd-III	Not recorded during the survey	Not recorded during the survey	N	33.64	Y	0.5 to 1	Hydrological drivers: precipitation, surface runoff, and possibly stormwater runoff from the highway to the north. Hydrologically isolated from wetland W29 due to berm with steep banks. Hydrologically isolated from wetland W31 due to railway.
W31	W-A-V	Not recorded during the survey	Not recorded during the survey	N	998.65	Y	Not recorded during the survey	Open and standing water present. Hydrological drivers: groundwater discharge, precipitation surface runoff, and stormwater runoff from adjacent roads. Hydrologically isolated from wetland W30 due to railway.
W32	M-G-III	Not recorded during the survey	Not recorded during the survey	N	1.59	N	Not recorded during the survey	No open or standing water present. Hydrological driver: culvert, groundwater, precipitation and stormwater runoff. Wetland associated with ditch at south margin and culverts at northwest margin which connect under highway.

[a] Alberta Wetland Classification System (AESRD 2015).

[b] Y=Yes; N=No

[c] Open water is defined as an expanse of open, mostly unshaded water in marshes and shallow open waters that typically supports submersed or floating vegetation (AESRD 2015); whereas, standing water is defined as water that accumulates due to precipitation events, does not support submersed or floating vegetation, and is not necessarily permanent throughout the seasons.

2.5.2 Dominant, Invasive and Listed Species Observations

2.5.2.1 Weed Species

One noxious weed species listed within the *Weed Control Regulation* (Province of Alberta 2010) of the *Weed Control Act* (Province of Alberta 2017), creeping thistle (*Cirsium arvense*), was observed throughout several wetlands (W01, W07, W09, W13, W16, W19) and across the Project Site during the 2016 field surveys (Golder 2016b). Two listed plant species, early buttercup (*Ranunculus glaberrimus*) (S3) and lance-leaved lungwort (*Mertensia lanceolata*) (S2), were observed during the 2014 EE field surveys in W11 and W06, respectively (AMEC 2014).

2.5.2.2 Vegetation Communities

The unique vegetation community types (as defined in AMEC 2014) are less common native habitats within the Project Site, indicating that “unique” vegetation community types in context of the EE do not necessarily refer to rare listed communities or habitat types. During the 2014 EA surveys (AMEC 2014), the following communities were reported as unique [wetland] vegetation types: graminoid meadows, shallow wetlands, permanent wetlands, tall seepage shrubland, and balsam popular forest in ravines. Ecological land cover and vegetation community types are provided in Appendix I.

2.5.2.3 Wildlife Observations

During the 2016 wetland surveys, 29 bird species, two species of amphibians, and three species of mammals were recorded by CH2M and Golder 2016. A list of wildlife species observed within the wetland areas during the 2016 field surveys is provided in Appendix J. The following species of concern were documented during the EE surveys (AMEC 2014):

- one short-eared owl, a Schedule 1 species Special Concern (SARA 2018) was observed within NW34-34-4 W5M, immediately outside the development footprint where suitable habitat was identified;
- one listed bat species, little brown bat (*Myotis lucifugus*) (May be at Risk) (GOA 2017c) was detected in the 2014 field recordings; and
- sora (Sensitive) (GOA 2017c) were observed within W11.

The Project Site lies within provincially-designated sensitive raptor range and sharp-tailed grouse area. As such, surveys for these species should be completed prior to any clearing and development activities on the site. In addition, migratory birds are protected under the *Migratory Birds Convention Act* (MBCA) (Environment Canada 1994) and the Alberta *Wildlife Act* (GOA 2014b). To avoid potential impacts to migratory birds, pre-construction searches for breeding birds are recommended prior to any clearing or construction activities during the Restricted Activity Period (RAP) from April 17 to August 24 in Bird Conservation Region B4 (Environment and Climate Change Canada [ECCC] 2016).

If construction activities are scheduled to occur within the RAP, it is recommended to clear vegetation prior to the RAP to minimize potential impacts to breeding birds. Nest surveys will include searches for breeding bird activity and nests, and if found, their locations will be documented with coordinates determined from a hand-held GPS. Locations will be flagged and recommendations will be made on how to proceed prior to removal of the vegetation based on provincial and federal guidelines and species-specific setback distances.

2.5.3 Wetland Relative Value Assessment

The ABWRET-A was used to determine the relative wetland value of all potentially impacted wetlands at the Project Site and the results are provided in Appendix K. The Project Site is located in Relative Wetland Value Assessment Unit (RWVAU) 13.

3.0 DISCUSSION

3.1 Project Impacts on Wetlands

Historically, the Project Site and surrounding landscape adjacent to the alignment have been predominantly modified pasture, cultivated land and urban development. From the 1920's to present, the hydrology and wetlands in the Project Site have been altered due mainly to livestock grazing and other agricultural activities, as well as drainage activities for development and road construction.

The Project involves construction of approximately 31 km of new six and eight lane divided freeway, 14 interchanges, as well as three watercourse realignments and associated crossing structures. Detailed plans for each of the respective Project impacted wetlands are provided in Appendix A. Project activities involve vegetation removal, soil stripping and salvage, dewatering and infilling of wetlands. A total of 24 wetlands encompassing 149.38 ha were assessed for full and partial direct impacts. Total direct impacts to 22.45 ha of wetland area are planned within the Project Site.

Table 7 provides a summary of the Project impacts to wetlands within the Project Site. The Project will fully impact 14 wetlands encompassing 18.65 ha of wetland area. Partial impacts will occur to nine additional wetlands encompassing 3.80 ha of wetland area. One wetland (i.e., W06) will now be completely avoided based on updated Project planning.

Table 7:Summary of Project Impacts to Wetlands

Wetland ID	Wetland Class (AWCS)[a]	Original Wetland Area [ha]	Wetland Area to be Impacted [ha]	Proportion of Wetland to be Impacted [%]	Timeline of Proposed or Completed Activity
Avoided Under Revised Project Planning Wetlands					
W06	W-A-IV	2.83	0	0	Avoided
Partially Impacted Wetlands					
W09[b]	M-G-III	1.07	0.86	80	Fall 2017
W10	M-G-III	0.12	0.01	8	Spring 2018
W21	M-G-II	1.02	0.18	17	Summer 2017
W23	W-A-V	15.34	1.22	8	Fall 2017
W26	W-A-V	2.63	0.23	9	Fall 2017
W27	W-A-V	2.39	0.8	34	Fall 2017
W30	S-Wd-III	1.05	0.12	11	Fall 2017
W31	W-A-V	103.99	0.25	<1	Fall 2017
W32	M-G-III	0.29	0.13	45	Summer 2018
	Subtotal	127.9	3.8	n/a	n/a
Fully Impacted Wetlands					
W01	M-G-II	0.09	0.09	100	Summer 2017
W04	S-Wd-III	0.17	0.17	100	Summer 2017
W07	S-S-III	1.01	1.01	100	Fall 2017[C]
W08	M-G-III	0.36	0.36	100	Fall 2017[C]
W11	W-A-V	11.68	11.68	100	Fall 2017
W12	M-G-III	0.3	0.3	100	Fall 2017
W13	M-G-III	0.01	0.01	100	Summer 2017
W14	M-G-II	0.53	0.53	100	Summer 2017

Table 7:Summary of Project Impacts to Wetlands

Wetland ID	Wetland Class (AWCS)[a]	Original Wetland Area [ha]	Wetland Area to be Impacted [ha]	Proportion of Wetland to be Impacted [%]	Timeline of Proposed or Completed Activity
W15	W-A-IV	2.64	2.64	100	Summer 2017
W16	M-G-II	0.33	0.33	100	Summer 2017
W19	M-G-II	0.02	0.02	100	Summer 2017
W20	M-G-II	0.1	0.1	100	Summer 2018
W22	W-A-V	1.19	1.19	100	Fall 2017
W24	M-G-III	0.22	0.22	100	Summer 2017
	Subtotal	*18.65*	*18.65*	*n/a*	*n/a*
Total		**149.38**	**22.45**	**n/a**	**n/a**

(a) Alberta Wetland Classification System (AESRD 2015)

(b) Compensation for W09 will be based on the original wetland area 1.07 ha due to the 50% threshold value

n/a = not applicable

3.2 Application of Mitigation Hierarchy

An Approval under the *Water Act* is required prior to impacting any wetland in Alberta (GOA 2013a). Avoidance or minimization of wetland impacts can eliminate or reduce the need for wetland compensation. Unavoidable and authorized impacts will require wetland compensation as per the *Alberta Wetland Mitigation Directive* (GOA 2017b). The following section outlines KGL's adherence to AEP's mitigation hierarchy for wetlands.

3.2.1 Avoidance

Of the reassessed wetlands, KGL plans to avoid direct impacts to one wetland (i.e., Wetland W06). The classification of W06 is W-A-IV and the total wetland area is 2.83 ha. The initial Project plan had proposed a 5% partial impact, but this wetland has now been completely avoided through incorporation of 130 m long, retaining wall that will border the northwest corner of the wetland (Appendix A). In addition, development of a TL5 class retaining wall with a self-contained stormwater collection and treatment system will prevent contaminated roadway runoff from entering the wetland. Hydrologic inflows from surface and groundwater discharge will be reduced by approximately 8.8%, however, this is not expected to reduce the overall function and class of the wetland (Figure 2).

3.2.2 Minimization

KGL plans to minimize direct and indirect impacts during construction to partially impacted wetlands as per the operational management policies and Best Management Practices (BMPs) outlined in the Southwest Calgary Ring Road ECO Plan (KGL 2018). In addition to the wetland specific mitigations provided in Table 8, operational BMPs implemented during construction include the following:

- A 30 m buffer will be maintained for the retained wetlands, where practicable. Where it is not practicable to maintain a 30 m buffer, the buffer will be reduced with input from an Authenticating Professional who meets the Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta. Wetlands that are approved to be disturbed (i.e., *Water Act* Approval) will maintain a 30 m buffer, as practical, and until such time removal of the buffer zone is required to commence with construction activities (i.e., as specified in the *Water Act* Approval);

- At a minimum, Environmentally Sensitive Area (ESA) flagging will be used to identify wetland buffer zones in the field. Retained wetlands will be delineated with a visual barrier (i.e., snow fencing, silt fence, etc.) that is demarcated with ESA signage;
- BMP's such as, but not limited to, secondary containment, appropriate fueling distances from wetlands, spill kits in close proximity to work near wetlands and waterbodies, following fueling protocols, use of erosion sediment and control measures will be used to prevent deleterious materials (e.g., gasoline, sediment, oil, etc.) from entering water bodies;
- Fuel, oil, or hazardous material will not be stored within 100 m of a wetland or other water body;
- Refueling will occur a minimum of 100 m from any wetland or other water body, where feasible. Where equipment refueling is necessary within 100 m of a wetland, the following will occur:
  - All containers, hoses and nozzles will be confirmed as free of leaks;
  - Operators are stationed at both ends of the hose during fueling unless the ends are visible and readily accessible by one operator; and
  - Fuel remaining in the hose is returned to the storage facility.
- All equipment must be cleaned prior to entering a wetland work area; documentation that equipment has been cleaned shall be provided to the KGL Environmental Department. Equipment wash water will not be released directly into water bodies;
- Equipment shall be cleaned after construction to ensure it does not transfer mud, debris, invasive plants or aquatic pests;
- Construction materials and debris will be kept from entering water bodies;
- Topsoil and fill will be stored away from wetlands and water bodies to prevent sedimentation and erosion;
- Emergency spill kits will be fully stocked and in close proximity to construction activities;
- All spill prevention and spill response procedures will be followed as outlined in the ECO Plan section "Environmental Emergency Response Procedures";
- Wetland dewatering will be done with a series of pumps and hoses. Water will be pumped from the surface to minimize suspended solids. A Pre-Pumping Checklist is to be used prior to commencing the dewatering of any wetlands;
- Fish screens will be used at all pump intakes;
- Stormwater quality will be managed through design implementations such as stormwater ponds and bio-infiltration swales;
- The slope of the discharge area will be taken into account and appropriate mitigations will be put in place to reduce pumped water velocity and erosion potential;
- All wetland disturbances will follow and be in compliance with the associated *Water Act* Approvals, as well as the Alberta Wetland Policy;
- Upper surface material will be salvaged to a maximum depth of 50 cm or to the depth of colour change where there is less than 50 cm of surface material;

- Salvage of the upper surface material will be delayed until immediately prior to construction;
- Wetland soil stockpiles will be separated from other soil stockpiles to avoid admixing. Soils will be kept moist to maintain the viability of the seedbank and root tubers;
- Re-vegetation of disturbed and cleared areas to be undertaken as soon as possible; and
- Shrub staking will take place along the disturbed margins of the wetlands or stormwater ponds to stabilize disturbance, reduce the potential for sediment introduction and restore habitat function where shrubs were present prior to construction and where directed by the Environmental Inspector.

3.2.3 Compensation

Numerous criteria were evaluated at each wetland before compensation was considered. The following list summarizes the primary considerations for each direct wetland impact further detailed in Table 8 below.

- Project Requirements: Traffic Utility Corridor (TUC) constraints, the location of existing traffic intersections, standard highway geometric constraints, driver safety requirements (e.g., reduction of road side barriers and walls) and Ultimate Stage 2 lane capacity. Ultimate Stage 2 lane capacity refers to space set aside within the roadway alignment for future infrastructure expansion by Alberta Transportation.
- Outcomes of the 2014 EE (AMEC 2014).
- The involvement of various stakeholders including, but not limited to, the City of Calgary, TTN, Alberta Transportation, Canadian Pacific Railroad, and Spruce Meadows community.
- The intent to utilize previously disturbed areas such as the Harvey Barracks military area and agriculturally disturbed areas.
- The avoidance of TTN culturally significant sites.

Compensation will be required for all wetlands directly impacted by Project activities. The compensation and proposed replacement plan for wetlands permanently impacted is further discussed in Section 3.4.

Table 8: Summary of Wetland Impact Rationale and Wetland Specific Minimization Approaches

Wetland ID	Wetland Impact Rationale and Wetland Specific Minimization
Wetland ID: W01 AWCS Class: M-G-II Original Wetland Area: 0.09 ha Impacted Area: 0.09 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W01 could not be avoided for the following reasons: ■ Geometric design standards and specifications as per Schedule 18 (Alberta Transportation 2016) constrain the alignment to the existing Highway 8 Elbow River Bridge west of W01. Avoidance would have resulted in a less than optimal geometry for high speed roadways and the Elbow River bridge alignment. ■ Safety standards as per Schedule 18 (Alberta Transportation 2016) require minimized barriers and obstructions near high speed roadways to maximize driver safety. Avoidance of the wetland would have required the construction of an approximately 100m long retaining wall topped with barriers along the roadway shoulder creating both drop-off and impact hazards to the travelling public. ■ In the post-reclamation scenario, the wetland was at risk for decreased hydrologic capacity and function due to the expected changes in surface gradients impacting inflows as well as the potential for degradation due to proximity to Highway 8 (i.e., potential contaminated highway surface runoff). As a result of the proposed works, a full take will be required for Wetland W01. Replacement requirements for Wetland W01 are described in Table 9.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W01. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W04 AWCS Class: S-Wd-III Original Wetland Area: 0.17 ha Impacted Area: 0.17 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W04 could not be avoided for the following reasons: ■ Safety standards as per Schedule 18 (Alberta Transportation 2016) require minimized barriers and obstructions near high speed roadways to maximize driver safety. Avoidance of the wetland would have required the installation of a retaining wall topped with a row of barriers along the roadway shoulder ■ Wetland 04 is located within a planned loop off ramp. Safety standards as per Schedule 18 (Alberta Transportation 2016) require that no standing water be located within the center of a loop ramp because it poses a risk for public safety and emergency vehicle traffic, as well as attracts wildlife to high speed traffic areas. ■ Loop ramps hydrologically and ecologically isolate wetlands; retaining the functionality of Wetland 04 is not feasible due to the post-construction change in water levels that would subsequently alter the vegetation composition beyond the existing functionality and structure. As a result of the proposed works, a full take will be required for Wetland W04. Replacement requirements for Wetland W04 are described in Table 9.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W04. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W07 AWCS Class: S-S-III Original Wetland Area: 1.01 ha Impacted Area: 1.01 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W07 could not be avoided for the following reasons: ■ The TUC in which the roadway alignment is located, was determined through consultation with various stakeholders (e.g., Alberta Transportation, City of Calgary, TTN, etc.). From this consultation process, a number of constraints were imposed on the TUC including: ▪ Maximize use of pre-disturbed lands where the alignment runs through the former Harvey Barracks and associated military areas, ▪ Avoid impacting the Weaselhead Flats Natural Environment Park and the Glenmore Conservation Area located to the east of the Project, ▪ Avoid displacement of TTN infrastructure including current residences to the west of the current road alignment and the TTN Administration building to the south. ■ As a result of these constraints, the width of the TUC was reduced to a narrow north-south corridor through the Elbow River Valley. This reduction further limited the potential for alignment adjustments between the intersections of 90th Ave, Southland, the Tsuu T'ina Parkway and the bridging of the Elbow River itself which must adhere to Project and Regulatory (i.e., Water Act) requirements pertaining to hydrology. ■ An option to bridge over Wetlands W07 and W08 was explored. However, due to limitations in roadway height and surface area for the ultimate lane capacity (requiring 4 bridges), the option did not provide any substantial benefit to the wetlands, while creating additional driver hazards (e.g., barriers, bridge icing, fall hazard, etc.). If bridges were constructed it would mean minimal clearance over the wetlands in this area (2 to 4 m). The reduction in the amount of available direct sunlight to wetland vegetation, impediment to birds and other wildlife utilizing the wetland and proximity to such a high traffic roadway would severely reduce the future viability of the wetlands. Consequently, focus was applied toward maintaining connectivity of overland flows to Wetland W06 using a by-pass culvert design in the location of Wetlands W07 and W08. ■ Lastly, Wetland W07 runs perpendicular through the TUC, as such a lateral roadway alignment could not be designed to accommodate the aforementioned constraints and avoid a direct impact to the wetland; the roadway must still cross the wetland. As a result of the proposed works, a full take will be required for Wetland W07. Replacement requirements for Wetland W07 are described in Table 9.
	Wetland Specific Minimization: ■ A new drainage system (C36) will be constructed to retain pre-disturbance hydrologic connectivity from the headwater source of W08 to W06. The drainage system will mitigate for potential admixing of stormwater and potential contamination resulting from roadway runoff. ■ Prior to incurring an approved impact to the wetland, general Project minimization strategies are applicable (see Section 3.2.2).

Table 8: Summary of Wetland Impact Rationale and Wetland Specific Minimization Approaches

Wetland ID	Wetland Impact Rationale and Wetland Specific Minimization
Wetland ID: W08 AWCS Class: M-G-III Original Wetland Area: 0.36 ha Impacted Area: 0.36 ha Proportion Impacted: 100% Type of Take: Full	Impacts to Wetland W08 could not be avoided for the following reasons: ■ The TUC in which the roadway alignment is located, was determined through consultation with various stakeholders (i.e., Alberta Transportation, City of Calgary, TTN, etc). From this consultation process, a number of constraints were imposed on the TUC including: ▪ Maximize pre-disturbed lands within the alignment that runs through the former Harvey Barracks and associated military areas, ▪ Avoid impacting the Weaselhead Flats Natural Environment Park and the Glenmore Conservation Area located to the east of the Project, ▪ Avoid displacement of TTN infrastructure including current residences to the west of the current road alignment and the TTN Administration building to the south. ■ As a result of these constraints, the width of the TUC was reduced to a narrow north-south corridor through the Elbow River Valley. This reduction further limited the potential for alignment adjustments between the intersections of 90th Ave, Southland, the Tsuu T'ina Parkway and the bridging of the Elbow River itself which must adhere to Project and Regulatory (i.e., Water Act) requirements pertaining to hydrology. ■ An option to bridge over Wetlands W07 and W08 was explored. However, due to limitations in roadway height and surface area for the ultimate lane capacity (requiring 4 bridges), the option did not provide any substantial benefit to the wetlands, while creating additional driver hazards (e.g., barriers, bridge icing, fall hazard, etc.). If bridges were constructed it would mean minimal clearance over the wetlands in this area (2 to 4 m). The reduction in the amount of available direct sunlight to wetland vegetation, impediment to birds and other wildlife utilizing the wetland and proximity to such a high traffic roadway would severely reduce the future viability of the wetlands. Consequently, focus was applied toward maintaining connectivity of overland flows to Wetland 06 using a by-pass culvert design in the location of Wetlands W07 and W08. ■ Lastly, Wetland W08 runs perpendicular through the TUC, as such a lateral roadway alignment could not be designed to accommodate the aforementioned constraints and avoid a direct impact to the wetland; the roadway must still cross the wetland. As a result of the proposed works, a full take will be required for Wetland W08. Replacement requirements for Wetland W08 are described in Table 9.
	Wetland Specific Minimization: ■ A new drainage system (C36) will be constructed to retain pre-disturbance hydrologic connectivity from the headwater source of W08 to W06. The drainage system will mitigate for potential admixing of stormwater and potential contamination resulting from roadway runoff. ■ Prior to incurring an approved impact to the wetland, general Project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W09 AWCS Class: M-G-III Original Wetland Area: 1.07 ha Impacted Area: 0.86 ha Proportion Impacted: 80% Type of Take: Full[1]	Impacts to Wetland W09 could not be avoided for the following reasons: ■ The TUC in which the roadway alignment is located, was determined through consultation with various stakeholders (i.e., Alberta Transportation, City of Calgary, TTN, etc.). From this consultation process, a number of constraints were imposed on the TUC including: ▪ Maximize use pre-disturbed lands within the alignment that run through the former Harvey Barracks and associated military areas, ▪ Avoid impacting the Weaselhead Flats Natural Environment Park and the Glenmore Conservation Area located to the east of the Project, ▪ Avoid displacement of TTN infrastructure including current residences to the west of the current road alignment and the TTN Administration building to the south. ■ As a result of these constraints, the width of the TUC was reduced to a narrow north-south corridor through the Elbow River Valley. This reduction further limited the potential for alignment adjustments between the intersections of 90th, Southland, the Tsuu T'ina Parkway and the bridging of the Elbow River itself which must adhere to Project and Regulatory (i.e., Water Act) requirements pertaining to hydrology. ■ The aforementioned larger-scale geometric constraints, influenced the location of the west abutment of the 90th Ave SW overpass, approach structures, and associated on- and off-ramps. As a result, the west abutment and associated structures are located directly on top of Wetland W09. As the roadway alignment could not be designed to accommodate the aforementioned constraints. As a result of the proposed works, a full take will be required for Wetland W09. Replacement requirements for Wetland W09 are described in Table 9.
	Wetland Specific Minimization: ■ A new drainage system will be constructed to retain pre-disturbance hydrologic connectivity from W09 (incl.Watercourse 01) to W06. The drainage system will mitigate for potential admixing of stormwater and potential contamination resulting from roadway runoff. ■ Prior to incurring an approved impact to the wetland, general project minimization are applicable (see Section 3.2.2).
Wetland ID: W10 AWCS Class: M-G-III Original Wetland Area: 0.12 ha Impacted Area: 0.01 ha Proportion Impacted:8% Type of Impact: Partial Take	Impacts to Wetland W10 could not be avoided for the following reasons: ■ Safety standards as per Schedule 18 (Alberta Transportation 2016) require minimized barriers and obstructions near high speed roadways to maximize driver safety. Avoidance of the wetland would have required the construction of a retaining wall topped with barriers along the roadway shoulder. ■ Aside from the 8% partial take, no further impacts have been identified for Wetland W10. Replacement requirements for the partial take on Wetland W10 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W10, the wetland class is expected to remain to same or reduce to M-G-II due to change in hydrologic inflows from the south and north (Figure 2). ■ Prior to incurring an approved impact to the wetland, general project minimization are applicable (see Section 3.2.2).

[1] Full compensation was provided for wetlands with a threshold value greater than 50%

Table 8: Summary of Wetland Impact Rationale and Wetland Specific Minimization Approaches

Wetland ID	Wetland Impact Rationale and Wetland Specific Minimization
Wetland ID: W11 AWCS Class: W-A-V Original Wetland Area: 11.68 ha Impacted Area: 11.68 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W11 could not be avoided for the following reasons: ■ As part of the EE (AMEC 2014) four (4) roadway alignment and profile options were considered in an effort to prevent or minimize impacts to Wetland W11. Options included routing the alignment on the east side of the wetland (on TTN land), routing to the west side (City of Calgary – Cedarbrae neighborhood), or splitting the northbound lanes on the east side and the southbound lanes on the west side. During the EE and preliminary design process it became apparent that the wetland would be impacted by any alternative alignment. Each alignment option was reviewed in terms of the total impact to the wetland, as well as to existing adjacent facilities and the adjacent residents. Option Four was selected because it reduced fragmentation of TTN lands, avoided impacts to culturally significant sites, and avoids existing residential neighborhoods, and reduced the requirement for future negotiations by incorporation of the Ultimate Stage capacity. ■ Avoidance options were limited by the proximity to the City of Calgary Lower Sarcee Reservoir facility and TTN culturally significant sites west of W11. As a result of the abovementioned constraints and due to the size and orientation of Wetland W11 (i.e., it is located almost entirely between the western and eastern boundaries of the TUC); high speed geometric design and safety standards and specifications as per Schedule 18 (Alberta Transportation 2016) restricted the feasibility of an alternative infrastructure crossing methods.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W11. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W12 AWCS Class: M-G-III Original Wetland Area: 0.30 ha Impacted Area: 0.30 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W12 could not be avoided for the following reasons: ■ As part of the EE (AMEC 2014) four (4) roadway alignment and profile options were considered in an effort to prevent or minimize impacts to Wetland W11. Options included routing the alignment on the east side of the wetland (on TTN land), routing to the west side (City of Calgary – Cedarbrae neighborhood), or splitting the northbound lanes on the east side and the southbound lanes on the west side. During the EE and preliminary design process it became apparent that the wetland would be impacted by any alternative alignment. Each alignment option was reviewed in terms of the total impact to the wetland, as well as to existing adjacent facilities and the adjacent residents. Option Four was selected because it reduced fragmentation of TTN lands, avoided impacts to culturally significant sites, and avoids existing residential neighborhoods, and reduced the requirement for future negotiations by incorporation of the Ultimate Stage capacity. ■ Avoidance options were limited by the proximity to the City of Calgary Lower Sarcee Reservoir facility and TTN culturally significant sites west of W12. As a result of the abovementioned constraints, high speed geometric design and safety standards as per Schedule 18 (Alberta Transportation 2016) restricted the feasibility of an alternative infrastructure crossing methods.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W12. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W13 AWCS Class: M-G-III Original Wetland Area: 0.01 ha Impacted Area: 0.01 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W13 could not be avoided for the following reasons: ■ Safety standards as per Schedule 18 (Alberta Transportation 2016) restrict the crossing design to perpendicular angles at the shortest distance possible (i.e., minimize roadway hazards by reducing the size of the bridge deck, which may be subject to icing). ■ Wetland W13 is central to the planned Fish Creek Boulevard interchange. The interchange location is restricted to the west by existing City of Calgary underground water reservoir and to the east by existing residents. ■ Significant changes to the surficial gradients were required as per the future Ultimate Stage Calgary Ring Road capacity (e.g., nearby constraints of the 146th Ave SW overpass structure), thus retaining pre-disturbance hydrologic conditions was not feasible.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W13. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W14 AWCS Class: M-G-II Original Wetland Area: 0.53 ha Impacted Area: 0.53 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W14 could not be avoided for the following reasons: ■ Geometric design and safety BMPs as per Schedule 18 (Alberta Transportation 2016) restrict the crossing design to perpendicular angles at the shortest distance possible. ■ Wetland W14 is central to the planned Fish Creek Boulevard interchange. The interchange location is restricted to the west by existing City of Calgary underground water reservoir and to the east by existing residents ■ Significant changes to the surficial gradients were required as per the future Ultimate Stage Calgary Ring Road capacity (e.g., nearby constraints of the 146th Ave SW overpass structure; and northbound offramp), thus retaining pre-disturbance hydrologic conditions was not feasible.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W14. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W15 AWCS Class: W-A-IV Original Wetland Area: 2.64 ha Impacted Area: 2.64 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W15 could not be avoided for the following reasons: ■ Wetland is located in the middle of the alignment. Due to the location of Wetland W15, the roadway alignment could not be reconfigured without signification changes to the interconnected roadway geometry of the Project alignment. The alignment is required to be in its current location to ensure connectivity with 162nd Ave SW. ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for maintenance of pre-disturbance hydrology.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W15. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).

Table 8: Summary of Wetland Impact Rationale and Wetland Specific Minimization Approaches

Wetland ID	Wetland Impact Rationale and Wetland Specific Minimization
Wetland ID: W16 AWCS Class: M-G-II Original Wetland Area: 0.33 ha Impacted Area: 0.33 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W16 could not be avoided for the following reasons: ■ Wetland is located central to the proposed northbound alignment and North Pine Creek (West) stormwater pond. ■ Further, due to the location of Wetland W15, the roadway alignment could not be reconfigured without signification changes to the interconnected roadway geometry of the Project alignment. The alignment is required to be in its current location to ensure connectivity with 162nd Ave SW. ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for the maintenance of pre-disturbance hydrology.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W16. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W19 AWCS Class: M-G-II Original Wetland Area: 0.02 ha Impacted Area: 0.02 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W19 could not be avoided for the following reasons: ■ Wetland is located in beneath the alignment of the northbound lanes. Wetland W19 could not be avoided, as the roadway alignment could not be reconfigured without signification changes to the interconnected roadway geometry of the Project alignment. The alignment is required to be in its current location to ensure connectivity with 162nd Ave SW. ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for the maintenance of pre-disturbance hydrology.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W19. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W20 AWCS Class: M-G-II Original Wetland Area: 0.1 ha Impacted Area: 0.1 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W20 could not be avoided for the following reasons: ■ Wetland is located central to the eastbound alignment of Highway 22X. The alignment is required to be in its current location to utilize the pre-disturbed areas of Highway 22X. ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for the maintenance of pre-disturbance hydrology.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W20. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W21 AWCS Class: M-G-II Original Wetland Area: 1.02 ha Impacted Area: 0.18 ha Proportion Impacted: 17% Type of Impact: Partial Take	Impacts to Wetland W21 could not be avoided for the following reasons: ■ Wetland is located central to the current alignment and loop ramp for the frontage access road which runs parallel to Highway 22X. ■ Aside from the 17% partial take, no further impacts have been identified for Wetland W21. Replacement requirements for the partial take on Wetland W21 are described in Table 9.
	Wetland Minimization Strategies: ■ Relocated a planned stormwater pond to the east of W21 to avoid and minimize impacts to W21. Impacts are confined to the outer perimeter of the wetland. ■ As a result of the limited direct impact to W21, the wetland class is expected to remain to same or it will be reduced to M-G-I due to change in hydrologic inflows from the south and north (Figure 2). ■ Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W22 AWCS Class: W-A-V Original Wetland Area: 1.19 ha Impacted Area: 1.19 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W22 could not be avoided for the following reasons: ■ Significant gradient changes were required to minimize the potential for stormwater admixing with low ground water tables in the areas of W22 and the City of Calgary stormwater pond on the north side of Highway 22X. The groundwater table restricted the geometric design of the roadway alignment. ■ Wetland is located central to the proposed alignment and the Spruce Meadows Interchange (which utilizes the pre-disturbed areas of the existing intersection). Safety standards and geometric design restrictions apply for interchange ramps as per Schedule 18 (Alberta Transportation 2016). ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for the maintenance of pre-disturbance hydrology into W22, so priority was given to not adversely affect groundwater hydrology as discussed in the first bullet.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W22. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W23 AWCS Class: W-A-V Original Wetland Area: 15.34 ha Impacted Area: 1.22 ha Proportion Impacted: 5% Type of Impact: Partial Take	Impacts to Wetland W23 could not be avoided for the following reasons: ■ Due to the high groundwater table, the design elevation of the proposed overpass is required to be increase. As a result, this increase in elevation extended the length of the overpass, which resulted in the need for the partial wetland take. ■ The portion of the wetland taken is central to the intersection of 188th Ave., Spruce Meadows Way, and the future SWCRR which requires a greater footprint to connect all three alignments. ■ Aside from the 5% partial take, no further impacts have been identified for Wetland W23. Replacement requirements for the partial take on Wetland W23 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W23, the wetland class and hydrologic function is expected to remain the same. No change in water chemistry is expected. ■ The proposed impact areas were kept as close as possible to the existing roadways and pre-disturbed areas to minimize any impact to the wetland functionality. ■ Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).

Table 8: Summary of Wetland Impact Rationale and Wetland Specific Minimization Approaches

Wetland ID	Wetland Impact Rationale and Wetland Specific Minimization
Wetland ID: W24 AWCS Class: M-G-III Original Wetland Area: 0.22 ha Impacted Area: 0.22 ha Proportion Impacted: 100% Type of Impact: Full Take	Impacts to Wetland W24 could not be avoided for the following reasons: ■ Wetland was unavoidable due to central location within the alignment and the geometric restrictions of the Spruce Meadows interchange and existing residential areas. ■ Proposed alignment avoided impacts to Wetland W25 located south of the proposed alignment.
	Wetland Specific Minimization: ■ There are no wetland specific minimization measures associated with Wetland W24. Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W26 AWCS Class: W-A-V Original Wetland Area: 2.63 ha Impacted Area: 2.63 ha Proportion Impacted: 9% Type of Impact: Partial Take	Impacts to Wetland W26 could not be avoided for the following reasons: ■ Wetland is located central to the current alignment. ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for the maintenance of pre-disturbance hydrology. ■ Aside from the 9% partial take, no further impacts have been identified for Wetland W26. Replacement requirements for the partial take on Wetland W26 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W26, the wetland class and hydrologic function is expected to remain the same. No change in water chemistry is expected. ■ Impacted areas are minimized by keeping the roadway footprint as small as possible while maintaining driver safety. ■ Disturbance occurred during a dry time of year, above the wetted perimeter of the wetland. ■ Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W27 AWCS Class: W-A-V Original Wetland Area: 2.39 ha Impacted Area: 0.8 ha Proportion Impacted: 34% Type of Impact: Partial Take	Impacts to Wetland W27 could not be avoided for the following reasons: ■ Wetland is located central to the current alignment. ■ Significant changes to the surficial gradients as per the future Ultimate Stage Calgary Ring Road capacity did not allow for the maintenance of pre-disturbance hydrology. ■ Aside from the 34% partial take, no further impacts have been identified for Wetland W27. Replacement requirements for the partial take on Wetland W27 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W27, the wetland may have a reduction in surface inflow from the south (Figure 2), however, wetland class and hydrologic function are expected to remain the same due to the groundwater connectivity. ■ Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W30 AWCS Class: S-Wd-III Original Wetland Area: 1.05 ha Impacted Area: 0.12 ha Proportion Impacted: 11% Type of Impact: Partial Take	Impacts to Wetland W30 could not be avoided for the following reasons: ■ Canadian Pacific Rail agreement resulted in a shift to existing level crossing south which resulted in unavoidable impacts to wetland W30. As a result of the existing Highway 22X alignment, residential areas, and Spruce Meadows no alternative options for avoidance were available. ■ Aside from the 11% partial take, no further impacts have been identified for Wetland W30. Replacement requirements for the partial take on Wetland W30 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W30, the wetland class and hydrologic function are expected to remain the same. No change in water chemistry is expected. ■ Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).
Wetland ID: W31 AWCS Class: W-A-V Original Wetland Area: 103.99 ha Impacted Area: 0.25 ha Proportion Impacted: <1% Type of Impact: Partial Take	Impacts to Wetland W31 could not be avoided for the following reasons: ■ Canadian Pacific Rail agreement resulted in a shift to existing level crossing south, which resulted in unavoidable impacts to wetland W31. As a result of the existing Highway 22X alignment, residential areas, and Spruce Meadows, no alternative options for avoidance were available. ■ Aside from the less than 1% partial take, no further impacts have been identified for Wetland W31. Replacement requirements for the partial take on Wetland W31 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W31, the wetland class and hydrologic function are expected to remain the same. No change in water chemistry is expected. ■ Prior to incurring an approved impact to the wetland, general project minimization are applicable (see Section 3.2.2).
Wetland ID: W32 AWCS Class: M-G-III Original Wetland Area: 0.29 ha Impacted Area: 0.13 ha Proportion Impacted: 45% Type of Impact: Partial Take	Impacts to Wetland W32 could not be avoided for the following reasons: ■ Wetland was previously impacted from urban development and was located within the off ramp alignment which was restricted by the existing Highway 22X and residential area east of the W32. No alternative options for interchange alignment were available. ■ Aside from the 45% partial take, no further impacts have been identified for Wetland W32. Replacement requirements for the partial take on Wetland W32 are described in Table 9.
	Wetland Specific Minimization: ■ As a result of the limited direct impact to W32, the wetland class and hydrologic function are expected to remain the same or decrease in class to M-G-II as a result of hydrologic changes to the surface inflows from the south (Figure 2). ■ Prior to incurring an approved impact to the wetland, general project minimization strategies are applicable (see Section 3.2.2).

3.3 Expected Environmental Effects

Project activities such as wetland dewatering, excavating, installation of culverts, and infilling are expected to result in permanent effects, such as loss of wetland plant and wildlife habitat, which extend beyond the construction period of the Project. During construction, potential accidents such as spills, leaks, erosion, sedimentation and compaction from heavy equipment could also result in a reduction of water quality and overall wetland function, however, these effects will be avoided and mitigated through application of BMPs and mitigation strategies included in the Project design and ECO Plan. Furthermore, residual effects, such as loss of wildlife habitat, will be compensated for through wetland restoration activities within the same primary watershed as described in Table 9 below.

Although few listed species were identified within wetlands on the Project Site, the potential to support rare wetland vegetation species and communities, and sensitive wetland wildlife species will be reduced within the Project Site as a result of declining wetland area. Adjacent urban encroachment on the remaining wetland systems in southwestern Calgary is also contributing to the potential for reduced abundance and distribution of unique wetland vegetation communities and sensitive wetland wildlife species, but managing these cumulative effects requires a much broader approach by regional stakeholders. The Project attempted to avoid potential effects to wetland plant and wildlife habitats but could not fully avoid these effects due to the constraints of the alignment relative to the Ultimate Project footprint. When avoidance or further minimization was not possible, the Project will be compensating for residual effects through wetland restoration activities within the same primary watershed as described in Table 9 below.

Changes to hydrologic patterns which govern surface flows may alter the water balance within the remaining wetland catchment areas as a result of the redistribution of surface flow and groundwater discharge. However, as part of the Project, stormwater facilities will be designed and operated to regulate all runoff discharge to receiving waterbodies (e.g., requirement to meet pre-development release rates). The proposed design mitigation measures are expected to be effective in reducing potential negative effects of changes to surface flows within localized wetland catchment areas. Furthermore, actual performance of the surface flow management design features will be directly assessed through the planned monitoring of future water quality and quantity at Wetland W06. Monitoring at this wetland will allow adaptive response that will reduce the risk of changes in wetland type and associated wildlife habitat redistribution from changing water levels.

To offset the expected environmental effects from the full or partial removal of 23 wetlands, a Wetland Replacement Plan is proposed in the following section as per the *Alberta Wetland Mitigation Directive* (GOA 2017b).

3.4 Proposed Wetland Replacement Plan

A wetland Replacement Plan based on the in-lieu fee option has been provided to compensate for the permanent impacts to 22.45 ha of wetland area. Table 9 summarizes the relative wetland values, compensation ratios, and total compensation costs for the 23 directly impacted wetlands. Compensation is no longer required for W06 because it has been completely avoided as a result of updated Project planning. KGL will work with AEP and an approved Wetland Restoration Agency (e.g., Ducks Unlimited Canada) to determine the next course of action for the wetland replacement requirements.

Table 9: Summary of Relative Wetland Values and Compensation Requirements for Directly Impacted Wetlands

Wetland ID	Wetland Class (AWCS)	Impacted Area [ha]	ABWRET-A SCORE	Wetland Compensation Ratio	Wetland Compensation Area [ha] [(a)]	Wetland Compensation Cost [(b)]
W01	M-G-II	0.09	B	4:1	0.36	$6,372
W04	S-Wd-III	0.17	B	4:1	0.68	$12,036
W07	S-S-III	1.01	C	2:1	2.02	$35,754
W08	M-G-III	0.36	C	2:1	0.72	$12,744
W09[(c)]	M-G-III	0.86	C	2:1	2.14	$37,878
W10	M-G-III	0.01	B	4:1	0.04	$708
W11	W-A-V	11.68	A	8:1	93.44	$1,653,888
W12	M-G-III	0.30	C	2:1	0.60	$10,620
W13	M-G-III	0.01	B	4:1	0.04	$708
W14	M-G-II	0.53	B	4:1	2.12	$37,524
W15	W-A-IV	2.64	A	8:1	21.12	$373,824
W16	M-G-II	0.33	B	4:1	1.32	$23,364
W19	M-G-II	0.02	B	4:1	0.08	$1,416
W20	M-G-II	0.10	C	2:1	0.20	$3,540
W21	M-G-II	0.18	B	4:1	0.72	$12,744
W22	W-A-V	1.19	C	2:1	2.38	$42,126
W23	W-A-V	1.22	B	4:1	4.88	$86,376
W24	M-G-III	0.22	D	1:1	0.22	$3,894
W26	W-A-V	0.23	B	4:1	0.92	$16,284
W27	W-A-V	0.80	B	4:1	3.20	$56,640
W30	S-Wd-III	0.12	C	2:1	0.24	$4,248
W31	W-A-V	0.25	B	4:1	1.00	$17,700
W32	M-G-III	0.13	C	2:1	0.26	$4,602
Total	**-**	**22.45**	**-**	**-**	**138.7**	**$2,454,990**

(a) Based on the wetland compensation ratio for individual wetland

(b) Compensation cost for Relative Wetland Value Assessment Unit 13 is $17,700 per hectare

(c) Compensation value for W09 has been calculated based on the original wetland area (1.07 ha) as per AEP's threshold criteria indicating wetlands with greater than 50% impact will require a full wetland compensation

4.0 SUMMARY AND RECOMMENDATIONS

A total of 22.45 ha of wetland area represented in 23 wetlands will be directly impacted and one wetland (W06) will be avoided based on updated Project planning. The proposed impacts are the result of careful analysis and design that has taken into account a number of factors including comments from stakeholders, safety of the traveling public, and use of previously disturbed areas. KGL proposes utilizing the in-lieu fee option (GOA 2017b) to compensate for the permanent wetland loss. Based on the relative wetland value scores and the associated wetland compensation costs in Relative Wetland Value Assessment Unit 13, a total of **$2,423,838** is required for wetland replacement.

To avoid potential impacts to wetland wildlife at all remaining undisturbed or partially disturbed wetlands, construction activities are recommended to be scheduled outside of applicable restricted activity periods as required by the *Migratory Birds Convention Act* (Environment Canada 1994) and the provincial *Wildlife Act* (GOA 2014).

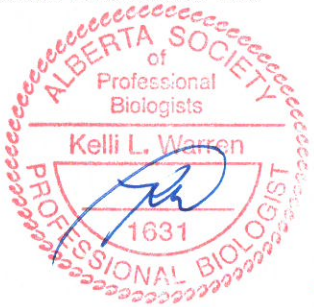
No further impacts are planned to wetlands within the Project Site. Furthermore, to reduce the risk of additional impacts to the remaining or partially impacted wetlands, KGL is committed to operational BMPs as per the SWCRR ECO Plan (KGL 2018) during construction and will adhere to the wetland reclamation standards of the *Alberta Wetland Mitigation Directive* (GOA 2017b), the SWCRR Revegetation Plan (Golder 2017a), as well as the best available science, technology and ecological principles available at the time of operation.

5.0 CLOSURE

We trust the above meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

Sincerely,

Golder Associates Ltd.



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APPENDIX A

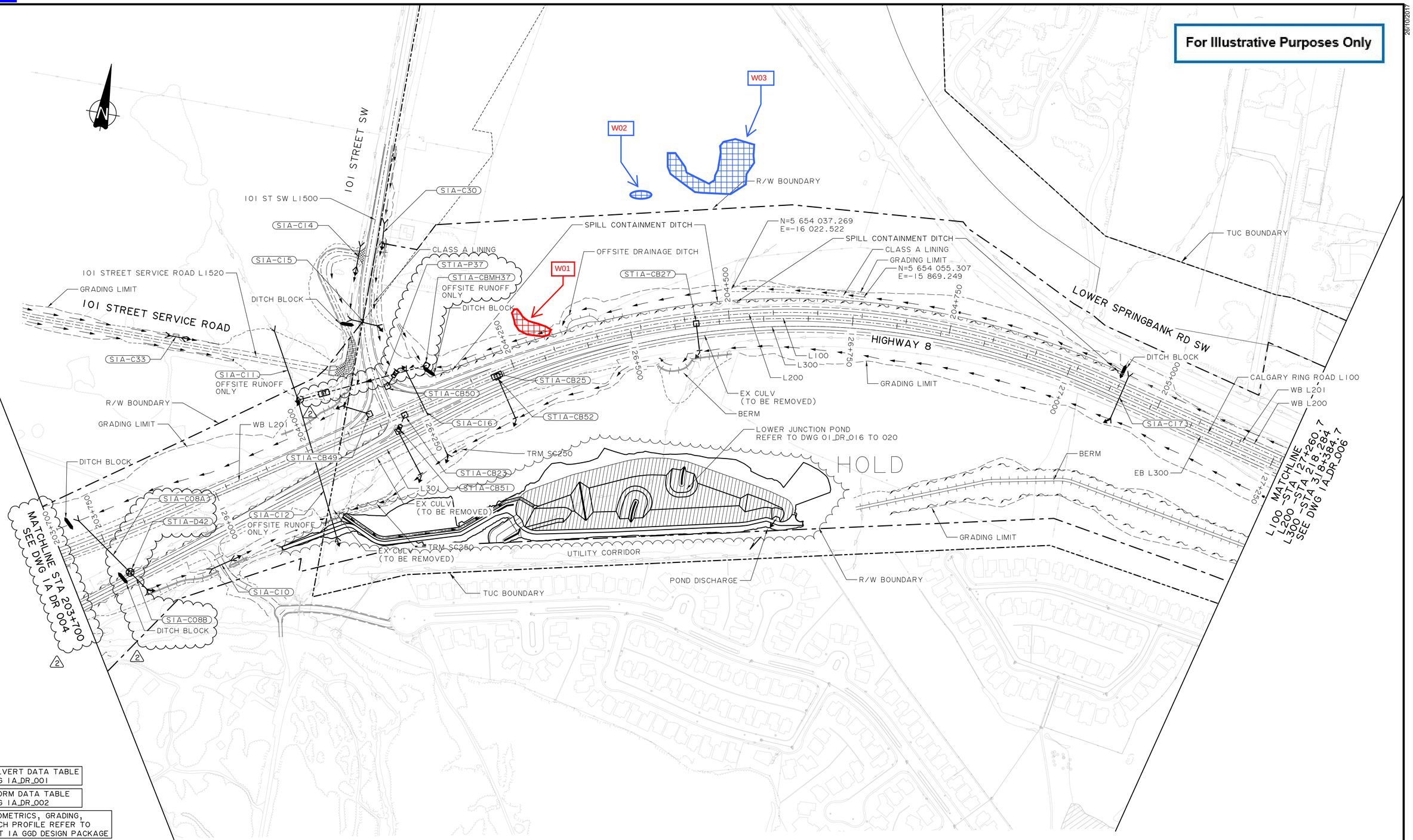
Project Plans

000_INDEX_DP040

DRAWING IA_DR_005
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN HIGHWAY 8 - L201, L301, L100
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE

26/10/2017

For Illustrative Purposes Only


N
101 STREET SW
101 ST SW L1500
SIA-C30
SIA-C14
SIA-C15
101 STREET SERVICE ROAD L1520
GRADING LIMIT
101 STREET SERVICE ROAD
DITCH BLOCK
SIA-C33
SIA-C11
OFFSITE RUNOFF ONLY
R/W BOUNDARY
GRADING LIMIT
WB L201
DITCH BLOCK
SIA-C08A
STIA-D42
SIA-C08B
DITCH BLOCK
SIA-C10
MATCHLINE STA 203+700 SEE DWG IA DR 004
W01
W02
W03
R/W BOUNDARY
SPILL CONTAINMENT DITCH
CLASS A LINING
OFFSITE DRAINAGE DITCH
STIA-P37
STIA-CBMH37
OFFSITE RUNOFF ONLY
DITCH BLOCK
STIA-CB27
N=5 654 037.269
E=-16 022.522
SPILL CONTAINMENT DITCH
CLASS A LINING
GRADING LIMIT
N=5 654 055.307
E=-15 869.249
TUC BOUNDARY
LOWER SPRINGBANK RD SW
HIGHWAY 8
L100
L300
L200
EX CULV (TO BE REMOVED)
BERM
GRADING LIMIT
DITCH BLOCK
CALGARY RING ROAD L100
WB L201
WB L200
SIA-C17
EB L300
STIA-CB25
STIA-CB50
STIA-CB52
SIA-C16
STIA-CB49
TRM SC250
STIA-CB23
STIA-CB51
L30
EX CULV (TO BE REMOVED)
LOWER JUNCTION POND
REFER TO DWG 01_DR_016 TO 020
HOLD
SIA-C12
OFFSITE RUNOFF ONLY
TRM SC250
EX CULV (TO BE REMOVED)
UTILITY CORRIDOR
POND DISCHARGE
R/W BOUNDARY
TUC BOUNDARY
GRADING LIMIT
L100 - MATCHLINE STA 127+260.7
L200 - STA 216:284
L300 - STA 318+384.7
SEE DWG IA_DR_006
204+000
204+250
204+500
204+750
205+000
205+250
205+500
205+750
206+000
206+250
206+500
206+750
207+000
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212+000
212+250
212+500
212+750
213+000
213+250
213+500
213+750

000_INDEX_DP040

DRAWING IA_DR_007
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN
CRR WB – L200, L300
SURVEYED
BY MCELHANNEY
DATE 2016-12-28
PHOTO NA
DEPARTMENT BAR CODE

23/11/2017

For Illustrative Purposes Only

STIA-CB22
TIE-IN TO EX MH 514
EX CB (TO BE REMOVED)
STIA-CB09
STIA-CB21
STIA-CB07
EX STM (TO REMAIN)
STIA-CB18
CLASS A LINING
EX STM (TO REMAIN)
EX CB (TO BE REMOVED)
STIA-P28
EX MH (ADJUST RIM TO FINISHED GRADE)
STIA-CB29
W04
STIA-CB17
EX MH (ADJUST RIM TO FINISHED GRADE)
STIA-CB36
EX STM (TO REMAIN)
STIA-CB30
STIA-CC57
STIA-CB16
STIA-CB19
STIA-CB15
EX MH & STORM (TO BE ABANDONED)
EX CB (TO BE REMOVED)
STIA-CB03
69 STREET SW
69 ST SW L1400
GRADING LIMIT
TUC BOUNDARY
SIA-C29
WB-NB L1430
SW-WB L1410
UTILITY CORRIDOR
SIA-C23
SIA-C22
R/W BOUNDARY
WB L200
STIA-CB12
BRIDGE 43
EX CULV (TO BE REMOVED)
EB L300
EX CULV (TO BE REMOVED)
EX CULV (TO BE REMOVED)
DITCH BLOCK
CALGARY RING ROAD
SIA-C25
SIA-C27B
STIA-P04
GRADING LIMIT
EX MH & STM (TO BE REMOVED)
REFER TO DRAWING 01 ST 002 & 003
EX MH (ADJUST RIM EL TO FINISHED GRADE)
STRATHCONA POND (EXISTING)
EX STM (TO REMAIN)
EXISTING WETLAND (BACKFILL EX WETLAND WITHIN ROW)
SIA-C36
SIA-C20
EB-SB L1420
STIA-CB02
NB-EB L1440
STIA-CB11
UTILITY CORRIDOR
BERM
GRADING LIMIT
TUC & UTILITY BOUNDARY
R/W BOUNDARY
STIA-CC58
EX MH & CB (TO BE REMOVED)
STIA-CB01
STIA-P54
STIA-MH54
CLASS A LINING
STIA-P53
STIA-MH53
STIA-P55
STIA-P56
STIA-CB10
SIA-C31
UTILITY CORRIDOR
REFER TO DRAWING 01_ST_001
TUC BOUNDARY
R/W BOUNDARY
PARTIALLY FILL DITCH BOTTOM COMMENCING AT ELEVATION 1107.20 m TO PROVIDE POSITIVE DRAINAGE
HOLD
R/W & UTILITY BOUNDARY
STIA-MH05
STIA-P05
EX CULV (TO REMAIN)
EX CULV (TO BE REMOVED)
EX STM (TO REMAIN)
SIA-C27A
GRADING LIMIT
STIA-MH04
STIA-MH06
STIA-P06
EX CULV (TO BE REMOVED)
EX STM (TO REMAIN)
217+000
216+750
216+500
216+250
216+000
215+750
317+000
316+750
316+500
316+250
316+000
315+750
MATCHLINE STA 217+050 SEE DWG IA_DR_006
MATCHLINE SEE DWG IB_DR_003 SEGMENT IB STA 215+565.137
SEGMENT IA
SEGMENT IB

FOR CULVERT DATA TABLE SEE DWG IA_DR_001
FOR STORM DATA TABLE SEE DWG IA_DR_002
FOR GEOMETRICS, GRADING, AND DITCH PROFILE REFER TO SEGMENT IA GGD DESIGN PACKAGE

Approved for Construction by KGL
08/02/2017 3:41:22 PM

ISSUED FOR CONSTRUCTION
November 22, 2017
KGL | PARSONS

KEY PLAN NTS
THIS DRAWING

SCALE
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
JOB No. 476002

PERMIT TO PRACTICE PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA LUCY X. SUN
2017-11-29
DATE

CHECKER
PROFESSIONAL ENGINEER ALBERTA JOHNNY LIU
DATE 2017-11-29

REV	DATE	REVISION	BY
5			
4	2017-11-22	NDC-PAR-RDW-0111.00	LS
3	2017-10-27	NDC-PAR-DRA-0081.00	LS
2	2017-09-29	CAD UPDATES. NO DESIGN CHANGES	LS
1	2017-09-06	FDC-KGL-DRA-0017.00	LS

DATE 2017-06-30 | LOCATION NA | SITE NA

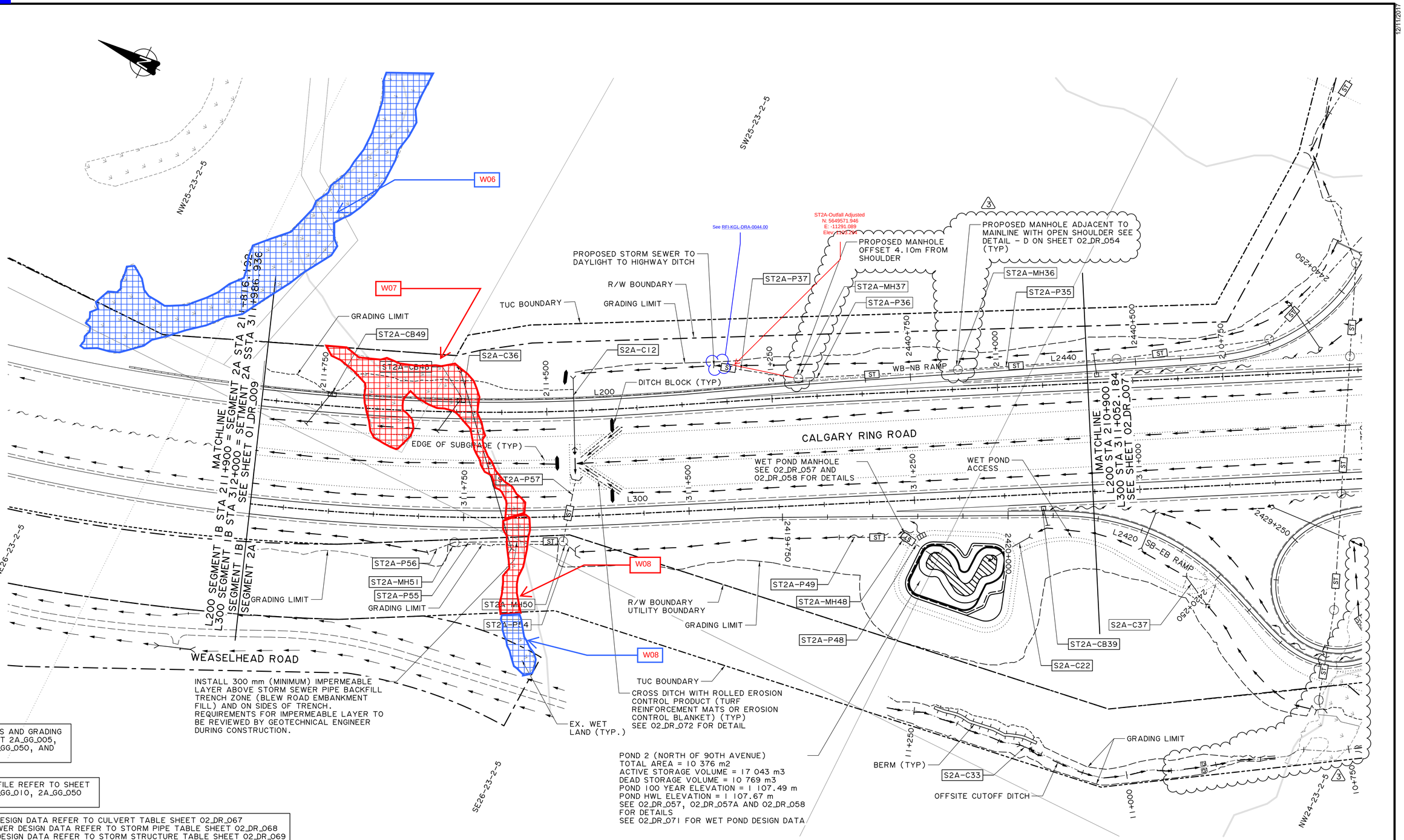
Alberta Transportation
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN – SEGMENT IA
CRR – L200, L300
L200 STA 217+050 TO STA 215+600

CONTRACT	HIGHWAY	SHEET	DRAWING
16944	201:06	0F	IA_DR_007

476002_IA_DRPLN_05

000_INDEX_DP063

DRAWING 02_DR_008
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN CRR - L200 & L300 (L200) STA 210+900 TO STA 211+816.192
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE



FOR GEOMETRICS AND GRADING REFER TO SHEET 2A_GG_005, 2A_GG_010, 2A_GG_050, AND 2A_GG_055

FOR DITCH PROFILE REFER TO SHEET 2A_GG_005, 2A_GG_010, 2A_GG_050 AND 2A_GG_055

FOR CULVERT DESIGN DATA REFER TO CULVERT TABLE SHEET 02_DR_067
FOR STORM SEWER DESIGN DATA REFER TO STORM PIPE TABLE SHEET 02_DR_068
FOR MANHOLE DESIGN DATA REFER TO STORM STRUCTURE TABLE SHEET 02_DR_069
FOR CATCHBASIN DESIGN DATA REFER TO CATCH BASIN TABLE SHEET 02_DR_070

Approved for Construction by KGL
07/19/2017 11:31:12 AM

ISSUED FOR CONSTRUCTION
December 8, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
McElhanney Engineering Services Ltd.
JOB No. 476002

PERMIT TO PRACTICE
McElhanney Engineering Services Ltd.
PERMIT NUMBER: P000815
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA W.S. SAMOIL
15 December 2017
DATE

CHECKER
PROFESSIONAL ENGINEER ALBERTA MICHAEL J.C. FLORENCIO
15 Dec 2017
DATE

REV	DATE	REVISION	BY
5			
4			
3	2017-12-08	FDC-058, NDC-134	NS
2	2017-09-27	NDC-041	NS
1	2017-09-11	NDC-027	NS

DATE 2017-06-05 | LOCATION NA | SITE NA

Alberta Transportation

HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
CALGARY RING ROAD - L200 AND L300 (L200) STA 210+900 TO STA 211+816.192

CONTRACT	HIGHWAY	SHEET	DRAWING
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476002_02_DRPLN_MI_008

12/11/2017

000_INDEX_DP063

DRAWING 02_DR_007
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN CRR - L200 & L300 (L200) STA 209+600 TO STA 210+900
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE

12/8/2017

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Outfall to WC01

SEE SHEET 02_DR_010
MATCHLINE STA 2400+437.632

ST2A-P45
ST2A-MH31
ST2A-P31
ST2A-CB33
ST2A-MH32
ST2A-P52
ST2A-CB34
ST2A-CB50
ST2A-CBMH18
ST2A-CB36
ST2A-P32
ST2A-P53
ST2A-MH33
ST2A-CB37
ST2A-P43
ST2A-MH42
ST2A-CBMH19
ST2A-P33
ST2A-P42
ST2A-MH34
S2A-C11
ST2A-MH35
S2A-C10
S2A-C09
ST2A-MH41
ST2A-P35
ST2A-P34
ST2A-CB31
ST2A-P41
ST2A-MH40
S2A-C17
S2A-C16
S2A-C08
S2A-C07
ST2A-P40
W09
W10
S2A-C06
S2A-C37
S2A-C41
ST2A-MH39
ST2A-P39
ST2A-MH52
ST2A-P59
ST2A-P50
ST2A-MH49
ST2A-P51

PROPOSED OUTFALL CHANNEL, SEE SHEET 02_DR_053 FOR DETAILS
PROPOSED MANHOLE ADJACENT TO RAMP WITH MOUNTABLE CURB SEE DETAIL - C ON SHEET 02_DR_054
PROPOSED MANHOLE ADJACENT TO RAMP WITH OPEN SHOULDER SEE DETAIL - B ON SHEET 02_DR_054 (TYP)
See RFI-KGL-DRA-0028.00
PROPOSED MANHOLE ADJACENT TO ULTIMATE MAINLINE SHOULDER (TO RIGHT) SEE DETAIL - D ON SHEET 02_DR_054
PROPOSED MANHOLE ADJACENT TO MAINLINE SHOULDER (TO LEFT) SEE DETAIL - A ON SHEET 02_DR_054
90 AVENUE BYPASS INLET SEE SHEET 02_DR_052 FOR DETAILS
3.0m LONG X 3.0 m WIDE X 0.275 m RIPRAP CLASS IM RIPRAP ARMORED

WB-NB RAMP L2440
NB-EB RAMP L2410
SB-EB RAMP L2420
WB-SB RAMP L2430
90 AVENUE SW
NB L200
SB L300
CALGARY RING ROAD
BRIDGE 27 SITE 82467 SEE DWG 46391
90 AVE SW L2400
BRIDGE DECK DRAIN INLET (TYP)
DITCH BLOCK (TYP)
EDGE OF SUBGRADE (TYP)
BERM
GRADING LIMIT
CROSS DITCH WITH ROLLED EROSION CONTROL PRODUCT (TURF REINFORCEMENT MATS OR EROSION CONTROL BLANKET) (TYP) SEE 02_DR_072 FOR DETAIL
TUC BOUNDARY
R/W BOUNDARY
UTILITY BOUNDARY
DRY POND MANHOLE SEE 02_DR_055 AND 02_DR_056 FOR DETAILS
BRIDGE DRAIN TROUGH (TYP)
OFFSITE CUTOFF DITCH
EMBANKMENT DRAIN TROUGH (TYP)
LIMIT OF CONSTRUCTION AT WETLAND
PROJECT LIMIT STA 2399+635.187

MATCHLINE L200 STA 210+900 +052.184 L300 STA 311+052.184 SEE SHEET 02_DR_008
MATCHLINE L200 STA 209+600 L300 STA 309+752.156 SEE SHEET 02_DR_006

SW25-23-2-5
NE24-23-2-5
SE24-23-2-5
NW24-23-2-5
SW24-23-2-5

FOR GEOMETRICS, GRADING AND DRAINAGE REFER TO SHEET 2A_GG_004, 2A_GG_009, 2A_GG_013, 2A_GG_025 TO 2A_GG_030, 2A_GG_49 AND 2A_GG_054

FOR DITCH PROFILE REFER TO SHEET 2A_GG_004, 2A_GG_09, 2A_GG_013, 2A_GG_027 TO 2A_GG_030, 2A_GG_49 AND 2A_GG_054

FOR CULVERT DESIGN DATA REFER TO CULVERT TABLE SHEET 02_DR_067
FOR STORM SEWER DESIGN DATA REFER TO STORM PIPE TABLE SHEET 02_DR_068
FOR MANHOLE DESIGN DATA REFER TO STORM STRUCTURE TABLE SHEET 02_DR_069
FOR CATCHBASIN DESIGN DATA REFER TO CATCH BASIN TABLE SHEET 02_DR_070

Approved for Construction by KGL
07/19/2017 11:31:12 AM

ISSUED FOR CONSTRUCTION
December 8, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
McElhanney
McElhanney Engineering Services Ltd.
JOB No. 476002

PERMIT TO PRACTICE
McElhanney Engineering Services Ltd.
PERMIT NUMBER: P000815
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA N.S. SAMPLE
15 December 2017
DATE

CHECKER
PROFESSIONAL ENGINEER ALBERTA MICHAEL J.C. FLORENDO
15 Dec 2017
DATE

REV	DATE	REVISION	BY
5			
4			
3			
2	2017-12-08	FDC-058	NS
1	2017-09-27	NDC-008, 041	NS

DATE	LOCATION	SITE
2017-06-05	NA	NA

Alberta Transportation

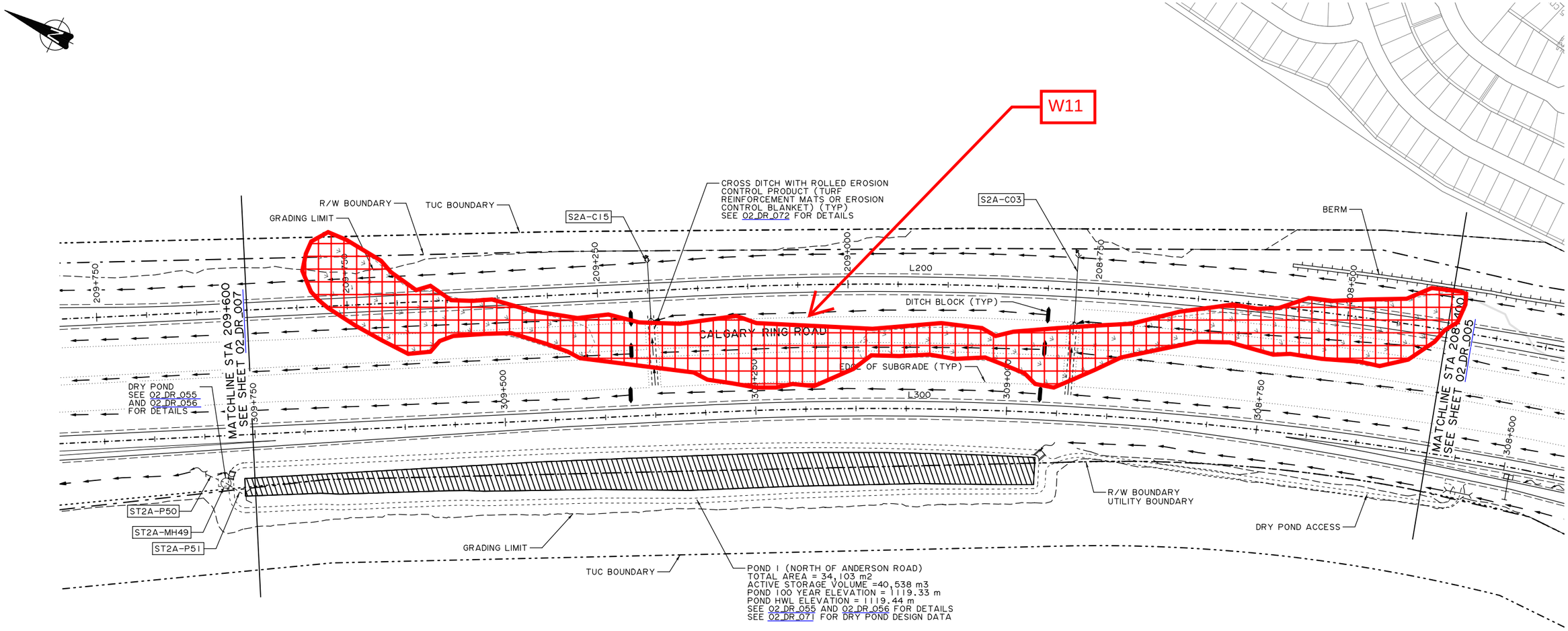
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
CALGARY RING ROAD - L200 AND L300 (L200) STA 209+600 TO STA 210+900

CONTRACT	HIGHWAY	SHEET	DRAWING
16944	201:06	OF	02_DR_007

476002_02_DRPLN_ML_007

000_INDEX_DP063

DRAWING 02_DR_006
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN
CRR - L200 & L300 (L200) STA 208+400 TO STA 209+600
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE



FOR GEOMETRICS, GRADING AND DRAINING REFER TO SHEET 2A_GG_003, 2A_GG_008, 2A_GG_048 AND 2A_GG_053

FOR DITCH PROFILES REFER TO SHEET 2A_GG_003, 2A_GG_008, 2A_GG_048 AND 2A_GG_053

FOR CULVERT DESIGN DATA REFER TO CULVERT TABLE SHEET 02_DR_067
FOR STORM SEWER DESIGN DATA REFER TO STORM PIPE TABLE SHEET 02_DR_068
FOR MANHOLE DESIGN DATA REFER TO STORM STRUCTURE TABLE SHEET 02_DR_069
FOR CATCHBASIN DESIGN DATA REFER TO CATCH BASIN TABLE SHEET 02_DR_070

For Illustrative Purposes Only

ISSUED FOR CONSTRUCTION
June 5, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
McElhanney Engineering Services Ltd.
JOB No. 476002

PERMIT TO PRACTICE
McElhanney Engineering Services Ltd.
PERMIT NUMBER: P000815
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER N.S. SAMUNI
28 June 2017
DATE

CHECKER
PROFESSIONAL ENGINEER MICHAEL J.C. FIORENTINO ALBERTA
28 June 2017
DATE

Approved for Construction by KGL
07/19/2017 11:31:12 AM

REV	DATE	REVISION	BY
5			
4			
3			
2			
1			

DATE	LOCATION	SITE
2017-06-05	NA	NA

Alberta Transportation

HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
CALGARY RING ROAD - L200 AND L300 (L200) STA 208+400 TO STA 209+600

CONTRACT	HIGHWAY	SHEET	DRAWING
16944	201:06	6 OF 35	02_DR_006

476002_02_DRPLN_MI_006

6/15/2017

000_INDEX_DP080

DRAWING 03_DR_015
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3
ALIGNMENT L200 - STA 300+800 TO STA 202+250
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE

NORTH PINE CREEK POND EAST
(SEE DWG Nos 03_DR_054 TO 03_DR_062)
NORTH PINE CREEK POND WEST
(SEE DWG Nos 03_DR_054 TO 03_DR_062)
VEGETATION CLASS A
SPWY 5
SPWY 4
SPWY 16
L200
L300
TUC BOUNDARY
R/W BOUNDARY
GRADING LIMIT
NPCP-C01
NPCP-C02
NPCP-C03
NPCP-C04
NPCP-C05
NPCP-C06
S3A-C17
S3A-C18
S3A-C29
S3A-C30
S3A-C31
S3A-C32
S3A-C33
S3A-C34
S3A-C35
S3A-C36
S3A-C37
S3A-C44
ST3A-CB07
ST3A-CB10
ST3A-CB21
BRIDGE 20
SITE 82463
(SEE DWG No 45951)
BRIDGE 18
SITE 82462 ENR2
(SEE DWG No 45851)
TRM PROTECTION
DITCH BLOCK TYP
TURF REINFORCEMENT MAT
TURF REINFORCEMENT MAT
REMOVE EXISTING CULVERT
W11
W19
MATCHLINE STA 202+250
SEE SHEET 03_DR_016
MATCH LINE STA 300+800
SEE SHEET 03_DR_014
DETAIL
DETAIL
DETAIL

For Illustrative Purposes Only

SIZES AND INSTALLATION DATA TABLES:

1. CULVERT TABLES – DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE – DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE – DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE – DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE – DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010
7. FOR TRM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

DETAIL
NTS

N 5 640 480.098
E -9 065.212
N 5 640 511.133
E -9 080.110
N 5 640 502.630
E -9 105.218
N 5 640 468.558
E -9 091.574

DETAIL
NTS

N 5 640 221.532
E -8 908.624
N 5 640 234.210
E -8 919.430
N 5 640 202.792
E -8 919.755
N 5 640 211.870
E -8 947.780

OVERLAND FLOW EROSION PROTECTION
CONSISTING OF TURF REINFORCEMENT MAT
(VMAX3, SC250)

Approved for Construction by KGL
09/05/2017 4:51:24 PM

ISSUED FOR CONSTRUCTION
October 16, 2017
KGL | PARSONS

KEY PLAN
NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
JOB No. 476002

PERMIT TO PRACTICE
PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA
KERNON BROWN
DATE 2017-10-27

CHECKER
PROFESSIONAL ENGINEER ALBERTA
ALBERT KOON-SUN LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2			
1	2017-10-16	NDC-0042 & CAD COMMENTS	VB

DATE 2017-07-07 | LOCATION NA | SITE NA

Alberta Transportation
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L200
STA 300+800 TO STA 202+250

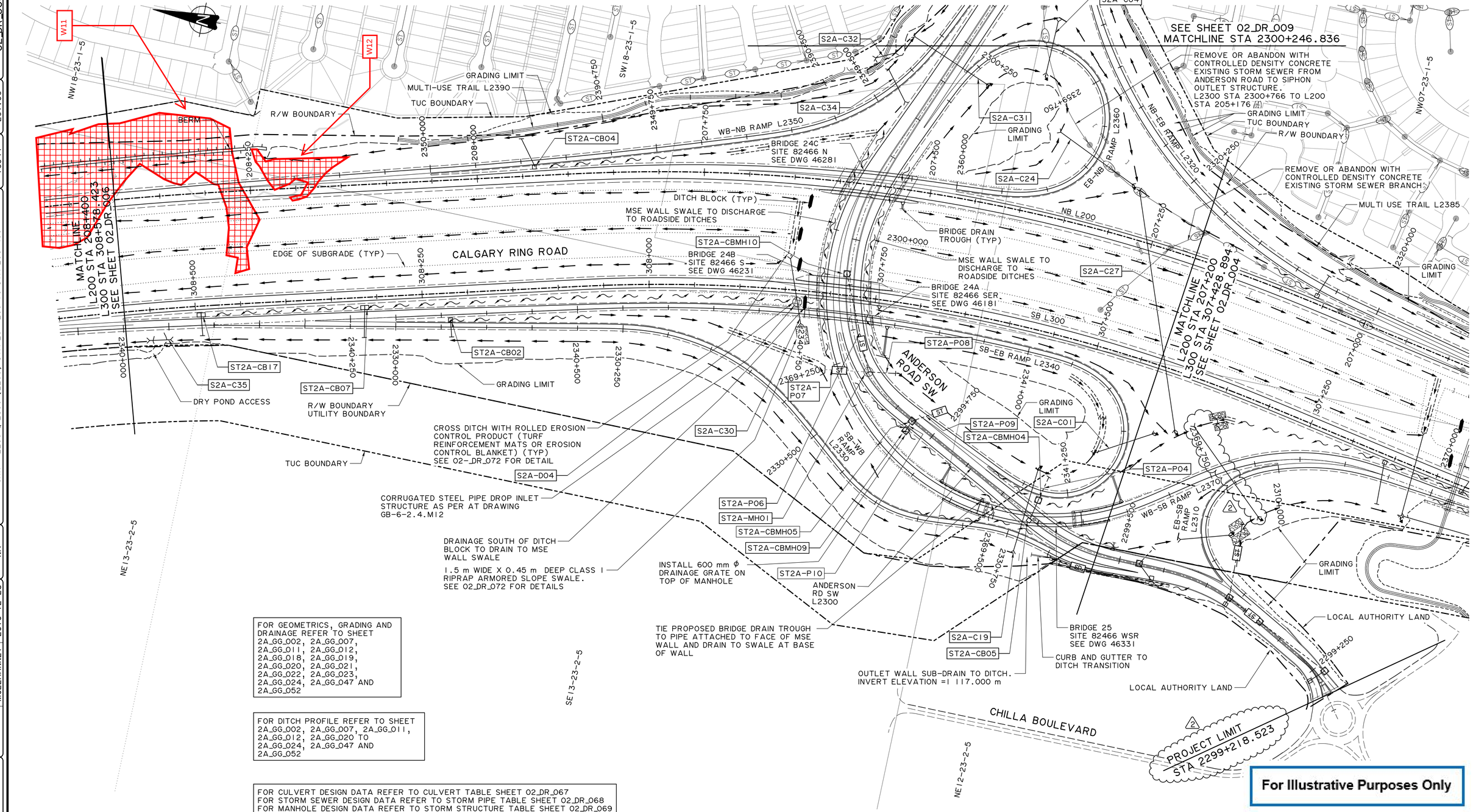
CONTRACT 16944 | HIGHWAY 201:06 | SHEET OF | DRAWING 03_DR_015

476002_03_DR_015.dgn
10/20/2017

000_INDEX_DP063

DRAWING 02_DR_005
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN CRR - L200 & L300 (L200) STA 207+200 TO STA 208+400
DEPARTMENT BAR CODE
SURVEYED
BY MCELHANNEY
DATE 2016-12-28
PHOTO NA

12/11/2017



FOR GEOMETRICS, GRADING AND DRAINAGE REFER TO SHEET 2A_GG_002, 2A_GG_007, 2A_GG_011, 2A_GG_012, 2A_GG_018, 2A_GG_019, 2A_GG_020, 2A_GG_021, 2A_GG_022, 2A_GG_023, 2A_GG_024, 2A_GG_047 AND 2A_GG_052

FOR DITCH PROFILE REFER TO SHEET 2A_GG_002, 2A_GG_007, 2A_GG_011, 2A_GG_012, 2A_GG_020 TO 2A_GG_024, 2A_GG_047 AND 2A_GG_052

FOR CULVERT DESIGN DATA REFER TO CULVERT TABLE SHEET 02_DR_067
FOR STORM SEWER DESIGN DATA REFER TO STORM PIPE TABLE SHEET 02_DR_068
FOR MANHOLE DESIGN DATA REFER TO STORM STRUCTURE TABLE SHEET 02_DR_069
FOR CATCHBASIN DESIGN DATA REFER TO CATCH BASIN TABLE SHEET 02_DR_070

For Illustrative Purposes Only

Approved for Construction by KGL
07/19/2017 11:31:12 AM

ISSUED FOR CONSTRUCTION
December 8, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
McElhanney Engineering Services Ltd.
JOB No. 476002

PERMIT TO PRACTICE
McElhanney Engineering Services Ltd.
PERMIT NUMBER: P000815
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA N.S. SAMOND
15 December 2017
DATE

CHECKER
PROFESSIONAL ENGINEER ALBERTA MICHAEL J.C. FLOREROS
15 Dec 2017
DATE

REV	DATE	REVISION	BY
5			
4			
3			
2	2017-12-08	FDC-056	NS
1	2017-09-27	NDC-017, -018	NS

DATE 2017-06-05 | LOCATION NA | SITE NA

Alberta Transportation
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
CALGARY RING ROAD-L200 AND L300
(L200) STA 207+200 TO STA 208+400

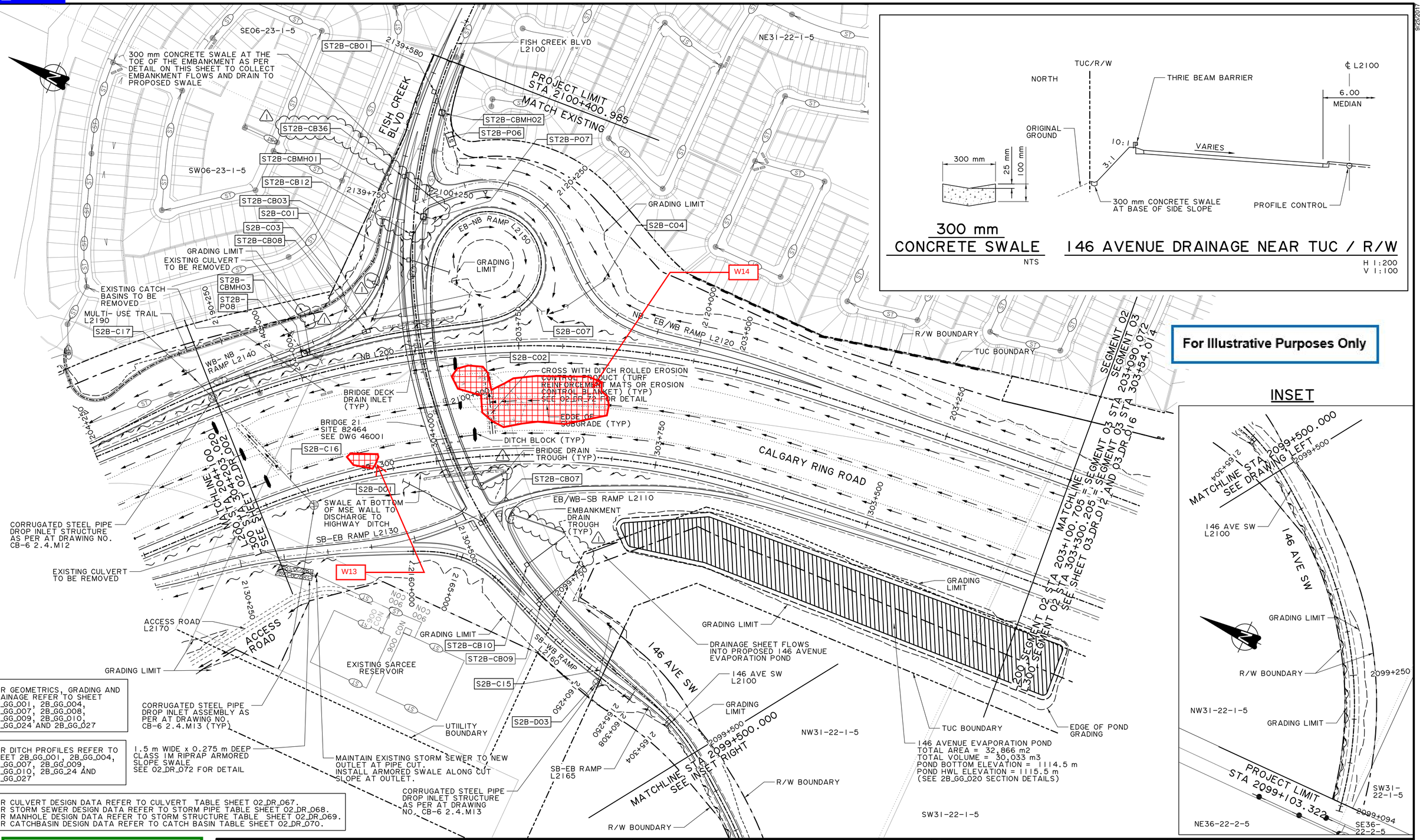
CONTRACT 16944 | HIGHWAY 201:06 | SHEET OF | DRAWING 02_DR_005

476002_02_DRPLN_ML_005

000_INDEX_DP063

DRAWING 02_DR_001 | HIGHWAY 201:06 | CONTRACT 16944 | DESCRIPTION HWY 201:06 SWCRR DRAINAGE PLAN CRR – L200 & L300 (L200) STA 203+100.705 TO STA 204+100 | SURVEYED | BY MCELHANNEY | DATE 2016-12-28 | PHOTO NA | DEPARTMENT BAR CODE

9/25/2017



300 mm CONCRETE SWALE

NTS

146 AVENUE DRAINAGE NEAR TUC / R/W

H 1:200
V 1:100

For Illustrative Purposes Only

INSET

Approved for Construction by KGL
07/19/2017 11:31:11 AM

ISSUED FOR CONSTRUCTION
September 27, 2017
KGL | PARSONS

KEY PLAN
NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
McElhanney Engineering Services Ltd.
JOB No. 476002

PERMIT TO PRACTICE
McElhanney Engineering Services Ltd.
PERMIT NUMBER: P000815
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA S. SAMUEL
5 October 2017
DATE

CHECKER
PROFESSIONAL ENGINEER ALBERTA MICHAEL J.C. FLORENCIO
5 Oct 2017
DATE

REV	DATE	REVISION	BY
5			
4			
3			
2			
1	2017-09-27	NDC-017, 026	NS

DATE	LOCATION	SITE
2017-06-05	NA	NA

Alberta Transportation

HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
CALGARY RING ROAD – L200 AND L300 (L200) STA 203+100.705 TO STA 204+100

CONTRACT	HIGHWAY	SHEET	DRAWING
16944	201:06	OF	02_DR_001

476002_02_DRPLN_MIL_001

000_INDEX_DP080

DRAWING 03_DR_016
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3 ALIGNMENT L200 - STA 202+250 TO STA 203+000
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE

10/20/2017

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Approved for Construction by KGL
09/05/2017 4:51:25 PM

SEGMENT 2B L200 STA 203+100.706 L300 STA 303+300.205
SEGMENT 3A L200 STA 203+090.072 L300 STA 303+154.014

EVAPORATION POND 146TH AVENUE
(SEE SEGMENT 2 POND DRAWINGS FOR DETAILS)

TUC BOUNDARY
R/W BOUNDARY
GRADING LIMIT
VEGETATION CLASS A
CONSTRUCTION LIMIT
CALGARY RING ROAD
162 AVENUE SW
DITCH BLOCK TYP
TURF REINFORCEMENT MAT
TRM PROTECTION
BRIDGE 20
SITE 82463
(SEE DWG No 45951)
L200
L300
W15
S3A-C41
S3A-C42
S3A-C35
S3A-C38
S3A-C39
S3A-C40
ST3A-CB16
ST3A-CB20
ST3A-CB21
ST3A-CB22
ST3A-CB23
ST3A-CB24
ST3A-CB26
ST3A-CB28
ST3A-CB29
ST3A-CB30
ST3A-CB31
ST3A-CB32
ST3A-CB35
ST3A-CB36
ST3A-CB37
SPWY 1
SPWY 2
SPWY 3
SPWY 4
SPWY 5
352+000
252+500
203+000
303+000
353+250
252+250
202+750
3530+500
352+000
252+250
202+500
302+500
3560+250
3520+000
3530+250
3500+250
3530+000
351+750
251+750
3510+750
3500+500
3500+750
3570
3499.00

MATCHLINE STA 202+250
SEE SHEET 03_DR_015

S DETAIL

SIZES AND INSTALLATION DATA TABLES:

1. CULVERT TABLES – DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE – DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE – DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE – DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE – DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010
7. FOR TRM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

N 5 641 621.370
E -9 236.501
N 5 641 621.617
E -9 223.397
N 5 641 616.902
E -9 253.156
N 5 641 599.615
E -9 222.352
N 5 641 597.671
E -9 251.455
N 5 641 599.467
E -9 234.807
N 5 641 597.797
E -9 240.862

OVERLAND FLOW EROSION PROTECTION CONSISTING OF TURF REINFORCEMENT MAT (VMAX3, SC250)

S DETAIL
NTS

KEY PLAN
NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS

JOB No. 476002

PERMIT TO PRACTICE
PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA
VERNON BROWN
DATE 2017-10-27

CHECKER
PROFESSIONAL ENGINEER ALBERTA
ALBERT KOON-SUN LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2			
1	2017-10-16	NDC-0042 & CAD COMMENTS	VB

DATE 2017-07-07
LOCATION NA
SITE NA

Alberta Transportation
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L200
STA 202+250 TO STA 203+000

CONTRACT	HIGHWAY	SHEET	DRAWING
16944	201:06	OF	03_DR_016

ISSUED FOR CONSTRUCTION
October 16, 2017
KGL | PARSONS

476002_03_DR_016.dgn

000_INDEX_DP080

DRAWING 03_DR_014
HIGHWAY 201:06
CONTRACT 16944
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE
DESCRIPTION
HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3
ALIGNMENT L100/L3430 - STA 299+800 TO STA 3430+740

10/20/2017

EXISTING OUTFALL TO BE PROTECTED
DETAIL S
S3A-C28
EXISTING STORM SEWER TO BE PROTECTED
MATCH LINE STA 300+800 SEE SHEET 03_DR_015
VEGETATION CLASS A
R/W BOUNDARY
TUC BOUNDARY
GRADING LIMIT
TURF REINFORCEMENT MAT
S3A-C12
L200
S3A-C10
REMOVE EXISTING CULVERT
ST3A-CB05
MATCH LINE STA 299+800 SEE SHEET 03_DR_013
3430+000
301+000
201+000
200+750
200+500
200+250
200+000
3411+000
S3A-C17
S3A-C18
REMOVE EXISTING CULVERT
3430+250
VEGETATION CLASS A
W20
S300
ST3A-CB15
BRIDGE 19 SITE 82462 WR (SEE DWG No 45901)
SPWY 7
S3A-C16
S3A-D03A
300+500
300+250
300+000
412+000
299+750
REMOVE EXISTING CULVERT
TURF REINFORCEMENT MAT
S3A-C19
3429+750
3430+500
3430+750
BRIDGE 17 SITE 82462 ENR1 (SEE DWG No 45801)
411+000
411+500
411+250
L400
S3A-D04
S3A-C48
SPCP-C01
512+000
511+750
511+500
511+250
L500
TURF REINFORCEMENT MAT
VEGETATION CLASS A
S3A-C43
188 AVENUE SW
3352+750
3352+500
R/W BOUNDARY
GRADING LIMIT
S3A-C11
TUC BOUNDARY
SOUTH PINE CREEK POND 1 (SEE DWG Nos 03_DR_038 TO 03_DR_046)
VEGETATION CLASS A
510+750
510+500
510+000
511+000
SPWY 14
SPWY 15
VEGETATION CLASS A
S3A-C14
3410+500
3410+250
S3A-C50
DITCH BLOCK TYP
S3A-C13
BSW-4 (NOTE 4)
S3A-C15
3352+000
3352+250
W21
CITY OF CALGARY LIMIT
MATCH LINE STA 3430+740 SEE SHEET 03_DR_017
3351+500
3351+750
TUC BOUNDARY
TURF REINFORCEMENT MAT
BSW-14 (NOTE 4)

For Illustrative Purposes Only

N 5 639 932.155
E -8 376.874
N 5 639 933.615
E -8 358.359
N 5 639 921.621
E -8 351.181
N 5 639 910.235
E -8 386.883
N 5 639 897.357
E -8 362.585

OVERLAND FLOW EROSION PROTECTION CONSISTING OF TURF REINFORCEMENT MAT (VMAX3, SC250)

DETAIL S
NTS

SIZES AND INSTALLATION DATA TABLES:

1. CULVERT TABLES - DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE - DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE - DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE - DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE - DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010.
7. FOR TRM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

Approved for Construction by KGL
09/05/2017 4:51:24 PM

ISSUED FOR CONSTRUCTION
October 16, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
HORIZONTAL SCALE 1:12000

CONSULTANT
KGL
PARSONS
JOB No. 476002

PERMIT TO PRACTICE
PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA KERNON BROWN
DATE 2017-10-27

CHECKER
PROFESSIONAL ENGINEER ALBERTA ALBERT KOON-SUN LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2			
1	2017-10-16	NDC-0042 & CAD COMMENTS	VB

DATE 2017-07-07 | LOCATION NA | SITE NA

Alberta Transportation
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L100/L3430
STA 299+800 TO STA 3430+740

CONTRACT	HIGHWAY	SHEET	DRAWING
16944	201:06	OF	03_DR_014

476002_03_DR_014.dgn

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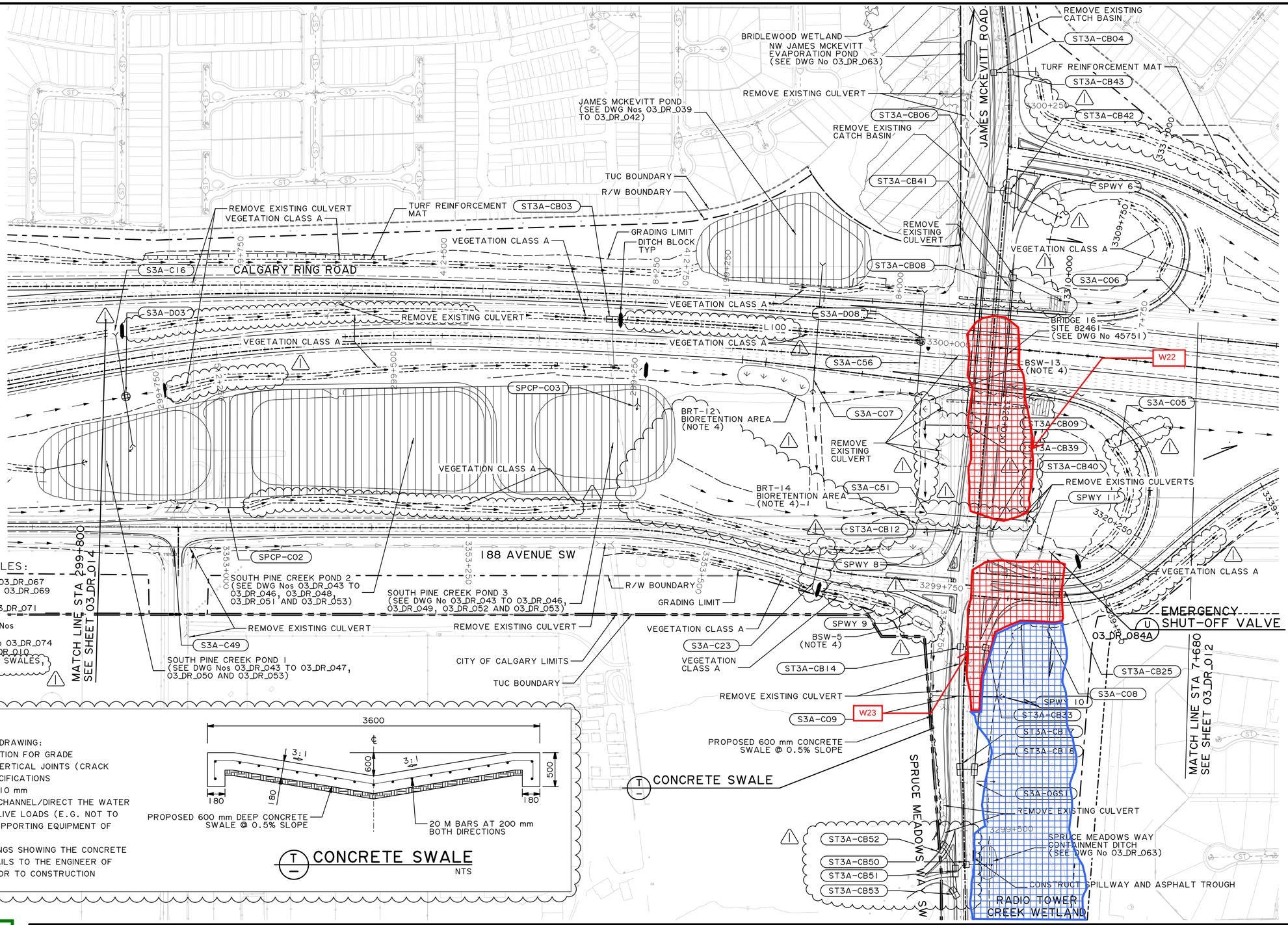
DRAWING 03_DR_013 | HIGHWAY 201:06 | CONTRACT 16944 | PHOTO NA | DATE 2016-12-28 | BY MCELHANNEY | SURVEYED

DESCRIPTION
HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3
ALIGNMENT L100 - STA 7+680 TO STA 299+800

DEPARTMENT BAR CODE

10/20/2017



SIZES AND INSTALLATION DATA TABLES:

1. CULVERT TABLES - DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE - DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE - DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE - DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE - DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010
7. FOR TRM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

NOTES:

1. FOLLOW THE DETAILS AND NOTES ON DRAWING: "STANDARD CONCRETE SLOPE PROTECTION FOR GRADE SEPARATION" - (S-1409-16). FOR VERTICAL JOINTS (CRACK CONTROL JOINTS) AND MATERIAL SPECIFICATIONS
2. CLEAR COVER FOR BARS IS 70 mm + 10 mm
3. THE CONCRETE SLAB IS DESIGNED TO CHANNEL/DIRECT THE WATER AND NOT TO CARRY OTHER DEAD OR LIVE LOADS (E.G. NOT TO BE USED FOR MATERIAL STORAGE, SUPPORTING EQUIPMENT OF VEHICULAR TRAFFIC)
4. CONTRACTOR TO SUBMIT SHOP DRAWINGS SHOWING THE CONCRETE DIMENSIONS AND REINFORCEMENT DETAILS TO THE ENGINEER OF RECORD FOR REVIEW/APPROVAL PRIOR TO CONSTRUCTION

T CONCRETE SWALE
NTS

Approved for Construction by KGL
09/05/2017 4:51:24 PM

ISSUED FOR CONSTRUCTION
October 16, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
HORIZONTAL SCALE 1:2000

CONSULTANT
PARSONS

JOB No. 476002

PERMIT TO PRACTICE PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA VERNON BROWN
DATE 2017-10-27

CHECKER
PROFESSIONAL ENGINEER ALBERTA KOON-SUN LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2			
1	2017-10-16	FDC-13, NDC-42/59 & CAD COMM	VB

Alberta Transportation

HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L100
STA 7+680 TO STA 299+800

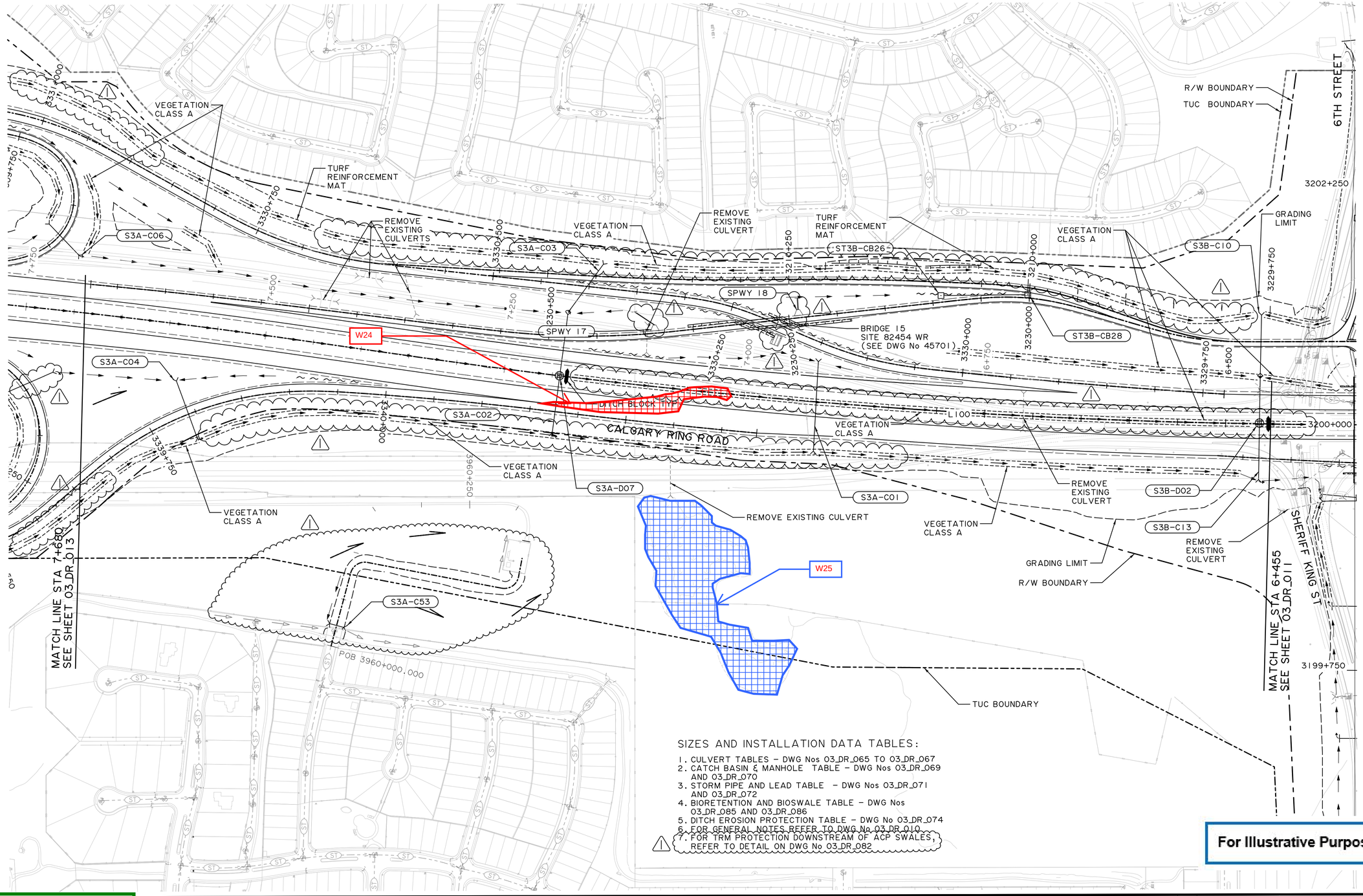
DATE	LOCATION	SITE	CONTRACT	HIGHWAY	SHEET	DRAWING
2017-07-07	NA	NA	16944	201:06		03_DR_013

476002_03_DR_013.dgn

000_INDEX_DP080

DRAWING 03_DR_012
HIGHWAY 201:06
CONTRACT 16944
DESCRIPTION HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3
ALIGNMENT L100 - STA 6+455 TO STA 7+680
PHOTO NA
DATE 2016-12-28
BY MCELHANNEY
SURVEYED
DEPARTMENT BAR CODE

10/20/2017



SIZES AND INSTALLATION DATA TABLES:

1. CULVERT TABLES – DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE – DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE – DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE – DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE – DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010
7. FOR TRM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

For Illustrative Purposes Only

Approved for Construction by KGL
09/05/2017 4:51:24 PM

ISSUED FOR CONSTRUCTION
October 16, 2017
KGL PARSONS

KEY PLAN NTS

SCALE
20 0 40m
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS
JOB No. 476002

PERMIT TO PRACTICE
PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA VERNON BROWN
DATE 2017-10-27

CHECKER
PROFESSIONAL ENGINEER ALBERTA ALBERT KOON-SUN-LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2			
1	2017-10-16	NDC-0042 & CAD COMMENTS	VB

Alberta Transportation
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L100
STA 6+455 TO STA 7+680

DATE	LOCATION	SITE	CONTRACT	HIGHWAY	SHEET	DRAWING
2017-07-07	NA	NA	16944	201:06	OF	03_DR_012

476002_03_DR_012.dgn

000_INDEX_DP080

DRAWING 03_DR_011 | HIGHWAY 201:06 | CONTRACT 16944

DESCRIPTION: HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3
ALIGNMENT L100 - STA 5+040 TO STA 6+455

DEPARTMENT BAR CODE | SURVEYED | BY MCELHANNEY | DATE 2016-12-28 | PHOTO NA

10/20/2017

CONSTRUCTION LIMIT
REMOVE EXISTING CATCH BASIN
6TH STREET
ST3B-CB10
R/W BOUNDARY
ST3B-CB34
ST3B-CB36
3202+250
3204+250
ST3B-CB12
SPWY 12
EMERGENCY SHUT-OFF
REMOVE EXISTING STORM SEWER
3229+750
ST3B-CB16
ST3B-CB35
TUC BOUNDARY
BRIDGE 14
SITE 82460
(SEE DWG No 45651)
REMOVE EXISTING CATCH BASINS
REMOVE EXISTING CULVERT
3229+750
6+500
6+250
VEGETATION CLASS A
DITCH BLOCK TYP
3200+000
CALGARY RING ROAD
REMOVE EXISTING CATCH BASIN
REMOVE EXISTING CULVERT
VEGETATION CLASS A
REMOVE EXISTING STORM SEWER
3220+000
REMOVE EXISTING CATCH BASINS
ST3B-CB11
PNDC-OS1
S3B-OGS1
S3B-C12
ST3B-CB53
ST3B-CB54
REMOVE EXISTING CULVERT
TURF REINFORCEMENT MAT
3220+250
ST3B-CB55
SPWY 13
CONCRETE SPILLWAY
S3B-C11
VEGETATION CLASS A
ST3B-CB56
3199+750
MATCH LINE STA 6+455
SEE SHEET 03_DR_012
ST3B-CB40
REMOVE EXISTING CULVERT
ST3B-CB58
ST3B-CB57
SHERIFF KING ST
SHERIFF KING SR
REMOVE EXISTING CATCH BASINS
S3B-C14
3910+500
3910+250
ST3B-CB42
ST3B-CB33
VEGETATION CLASS A
ST3B-CB23
3203+500
3201+500
CONSTRUCTION LIMIT

NORTH PRIDDIS SLOUGH
CPR RAIL CORRIDOR
W26
REMOVE EXISTING CULVERTS
ST3B-CB39
BSW-3
(NOTE 4)
6+000
3176+000
6+250
3211+750
ST3B-CB64
S3B-C24
ST3B-CB65
ST3B-CB41
ST3B-CB66
BRT-1
BIORETENTION AREA
(NOTE 4)
BRIDGE 12
SITE 77545 W
(SEE DWG No 45551)
W27
WEST MIDNAPORE POND
EXISTING STORM SEWER TO BE PROTECTED
PROPOSED EPS FOAM OVER STORM PIPE LOCATION AS PER GEOTECHNICAL RECOMMENDATIONS
BRIDGE 11
SITE 77546 NWR
(SEE DWG No 45501)
BRIDGE 4
SITE 77546 W3
(SEE DWG No 45151)
GRADING LIMIT
REMOVE EXISTING CULVERT
3130+500
SPWY 44
SPWY 19
SPWY 20
ST3B-CB27
SPWY 24
SPWY 23
ST3B-CB62
SPWY 22
REMOVE EXISTING CATCH BASIN
BRIDGE 13
SITE 77545 E
(SEE DWG No 45601)
ST3B-CB08
ST3B-CB25
S3B-C25
ST3B-CB30
ST3B-CB37
ST3B-CBMH02
ST3B-CB38
ST3B-CBMH05
SPWY 2
ST3B-CBMH08
BSW-2
(NOTE 4)
W30
W31
ST3B-CB31
ST3B-MH01
S3B-C16
S3B-C21
SOUTH PRIDDIS SLOUGH
BRIDGE 6
SITE 77546 EN1I
(SEE DWG No 45251)
GRADING LIMIT
R/W BOUNDARY
ST3E-CB09
VEGETATION CLASS A
TUC BOUNDARY
SOUTH PRIDDIS SLOUGH
OVERLAND SPILL ROUTE FOR POND OVERFLOW TO PRIDDS SLOUGH
SW MACLEOD POND
(SEE DWG Nos 03_DR_029 TO 03_DR_031)
POND C
(SEE DWG Nos 03_DR_034 TO 03_DR_038)

MATCH LINE STA 3150+350
SEE SHEET 03_DR_020
S3B-C09
S3B-D01
REMOVE EXISTING CATCH BASIN
REMOVE EXISTING CULVERTS
3130+250
SPWY 26
SPWY 27
3154+250
3150+250
3157+250
ST3B-CB14
REMOVE EXISTING CATCH BASIN
S3B-C19
ST3B-CB63
SPWY 41
BRIDGE 3
SITE 77546 WSR2
(SEE DWG No 45101)
REMOVE EXISTING CULVERTS
ST3B-CB01
S3B-C07
BRIDGE 1
SITE 77546 W2
(SEE DWG No 4500
SPWY 28
SPWY 25
TURF REINFORCEMENT MAT
ST3B-CBMH12
SPWY 29
SPWY 42
SPWY 30
SPWY 31
SPWY 43
3111+000
BRIDGE 5
SITE 77546 EI
(SEE DWG No 45201)
ST3B-CB02
ST3B-CBMH16
ST3B-CB32
3180+000
BRIDGE 2
SITE 77546 E2
(SEE DWG No 45051)
SPWY 32
S3B-C17
VEGETATION CLASS A
S3B-C05
REMOVE EXISTING CULVERT
ST3B-CBMH04
SPWY 33
VEGETATION CLASS A
TURF REINFORCEMENT MAT
3153+750
BRIDGE 7
SITE 77546 ENR2
(SEE DWG No 45301)
S3B-C03
MACLEOD TRAIL
MATCH LINE STA 5+040
SEE SHEET 03_DR_010
PROPOSED ACCESS ROAD TO POND
3153+500

INSTALL ORBINOX MU BI-DIRECTIONAL 780 mm x 780 mm SLUICE GATE w/ NON-RISING STEM AND STRAIGHT FLOOR STAND

NOTES:
1. SEE SPILL CONTROL STRUCTURE DETAIL ON DWG No 03_DR_028 FOR DETAILS

CONCRETE HEADWALL WITH EMERGENCY SHUT-OFF SLUICE GATE

SIZES AND INSTALLATION DATA TABLES:
1. CULVERT TABLES – DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE – DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE – DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE – DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE – DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010
7. FOR ERM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

Approved for Construction by KGL
09/05/2017 4:51:24 PM

ISSUED FOR CONSTRUCTION
October 16, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE 20 0 40m HORIZONTAL SCALE 1:2000

CONSULTANT: KGL | PARSONS

JOB No. 476002

PERMIT TO PRACTICE PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER: PROFESSIONAL ENGINEER ALBERTA, HERMON BROWN
DATE 2017-10-27

CHECKER: PROFESSIONAL ENGINEER ALBERTA, ALBERT KOON-SUN LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2	2017-10-16	NDC-0042/0055 & CAD COMMENTS	VB
1	2017-09-13	NDC-PAR-DRA-0029/0030	VB

DATE 2017-07-07 | LOCATION NA | SITE NA

Alberta Transportation

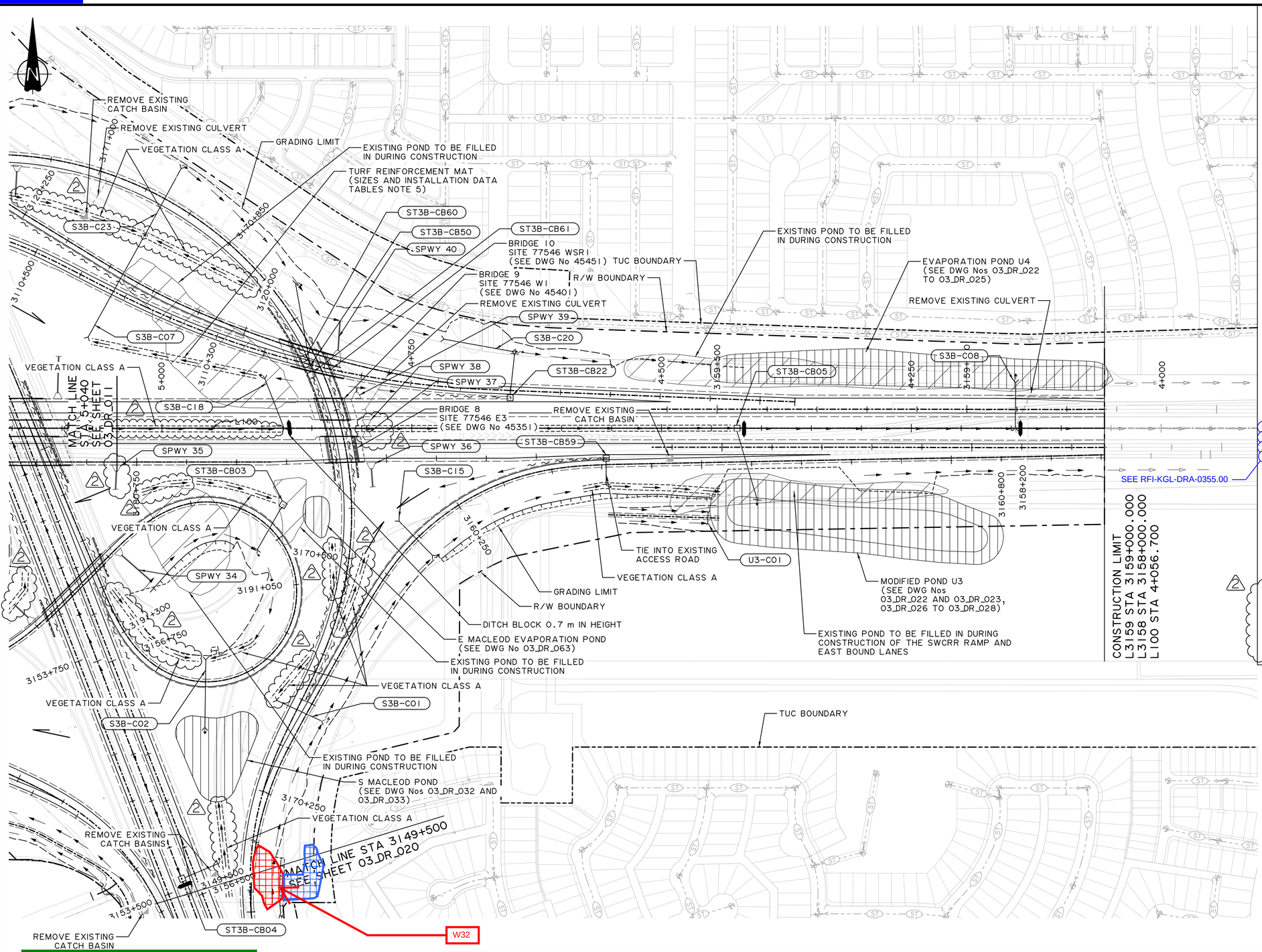
HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L100
STA 5+040 TO STA 6+455

CONTRACT	HIGHWAY	SHEET OF	DRAWING
16944	201:06		03_DR_011

476002_03_DR_011.dgn

000_INDEX_DP080

DRAWING 03_DR_010 | HIGHWAY 201:06 | CONTRACT 16944 | DESCRIPTION HWY 201:06 - SOUTHWEST CALGARY RING ROAD - SEGMENT 3 ALIGNMENT L100 - STA 3+600 TO STA 5+040 | PHOTO NA | DATE 2016-12-28 | BY MCELHANNEY | SURVEYED | DEPARTMENT BAR CODE



GENERAL DRAINAGE NOTES (TYPICAL):

1. CULVERTS, STORM SEWERS, DITCH INLETS, AREA DRAINS, ETC TABLES ARE INCLUDED ON DWG Nos 03_DR_065 TO 03_DR_073A
2. DESIGNS TO BE CONSTRUCTED IN ACCORDANCE WITH ALBERTA TRANSPORTATION AND CITY OF CALGARY (WHERE APPLICABLE) STANDARDS AND SPECIFICATIONS
3. INSTALLATION OF ALL CSP CULVERTS TO FOLLOW AT STANDARD CB6 2.4M1
4. INSTALLATION OF ALL CONCRETE STORM SEWERS TO FOLLOW AT STANDARD CB6 2.4M2
5. ALL STORM SEWER PIPE BEDDING TO BE AS PER AT STANDARD CB6 2.10M18. BEDDING CLASS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER
6. ALL STORM SEWER INLETS AND OUTLETS TO BE COMPRISED OF CONCRETE FLARED END SECTIONS AS PER AT STANDARD CB-6 5.16M1
7. ALL CULVERTS TO BE CORRUGATED STEEL PIPE (CSP) COMPLETE WITH SLOPED END SECTIONS AS PER AT STANDARD CB-6 2.4M7 UNLESS NOTED OTHERWISE
8. ALL DITCH BLOCKS TO BE PER AT STANDARD CB-6 2.3M39
9. ALL EMBANKMENT DRAIN TROUGHS TO BE INSTALLED AS PER AT STANDARD CB-6 4.2M69
10. ALL CATCHBASIN LEADS REFER TO DWG Nos 03_DR_071 AND 03_DR_072
11. ALL DROP INLETS TO CORRUGATED STEEL PIPES CONFORM TO AT STANDARD CB-6 2.4M12 AND AT STANDARD CB-6 2.4M13
12. ROCK RIPRAP (UNLESS NOTED OTHERWISE) TO BE PLACED AT ALL INLET AND OUTLET OF CULVERTS AND STORM SEWERS AS PER AT STANDARD CB6-2.5M1
13. ALL CATCHBASIN LEAD OUTFALLS TO INCLUDE A CLASS IM - 1m WIDE BY 2 m LONG (MINIMUM) ROCK RIPRAP APRON UNLESS NOTED OTHERWISE
14. RIPRAP TO BE INSTALLED AT ALL CULVERTS AS PER DWG Nos 03_DR_065, 03_DR_066, AND 03_DR_067
15. CITY OF CALGARY STANDARD CATCHBASINS TO BE USED AS SPECIFIED WITHIN THE CATCHBASIN INSTALLATION TABLE PROVIDED
16. DITCH EROSION CONTROL MATTING TO CONSIST OF A NILEX TURF REINFORCEMENT MATS (TRMs) SC250 VMAX3 OR APPROVED EQUIVALENT
17. NORTHING AND EASTING FOR CATCH BASINS ON DWG Nos 03_DR_069 AND 03_DR_070 REFER TO THE INSTALLATION POINTS INDICATED ON DWG No 03_DR_082 AND 03_DR_083
18. CULVERT EMBEDMENT TO BE 15% OF DIAMETER MINIMUM UNLESS OTHERWISE NOTED
19. SWALES AT CULVERT DROP INLETS TO BE GRADED TO PROVIDE POSITIVE DRAINAGE TO INLET
20. DRAINAGE PIPES, STRUCTURES AND CULVERTS TO BE INSTALLED, BACKFILLED AND BEDDED AS PER GEOTECHNICAL ENGINEER'S SPECIFICATIONS
21. A DELINEATOR WITH WHITE REFLECTIVE STRIP IS TO BE PLACED ABOVE ALL CULVERT ENDS AND DRAINAGE INLETS AND OUTLETS TO CLEARLY MARK THEM
22. ALL DITCH BLOCKS TO BE CONSTRUCTED TO 0.5 m BELOW THE EDGE OF THE SHOULDER, UNLESS OTHERWISE NOTED. REFER TO NOTE No 8 FOR THE STANDARD DETAIL REFERENCE.

For Illustrative Purposes Only

SIZES AND INSTALLATION DATA TABLES:

1. CULVERT TABLES - DWG Nos 03_DR_065 TO 03_DR_067
2. CATCH BASIN & MANHOLE TABLE - DWG Nos 03_DR_069 AND 03_DR_070
3. STORM PIPE AND LEAD TABLE - DWG Nos 03_DR_071 AND 03_DR_072
4. BIORETENTION AND BIOSWALE TABLE - DWG Nos 03_DR_085 AND 03_DR_086
5. DITCH EROSION PROTECTION TABLE - DWG No 03_DR_074
6. FOR GENERAL NOTES REFER TO DWG No 03_DR_010
7. FOR TRM PROTECTION DOWNSTREAM OF ACP SWALES, REFER TO DETAIL ON DWG No 03_DR_082

Approved for Construction by KGL
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ISSUED FOR CONSTRUCTION
October 16, 2017
KGL | PARSONS

KEY PLAN NTS

SCALE
HORIZONTAL SCALE 1:2000

CONSULTANT
KGL
PARSONS

JOB No. 476002

PERMIT TO PRACTICE
PARSONS INC.
PERMIT NUMBER: P07013
The Association of Professional Engineers and Geoscientists of Alberta

DESIGNER
PROFESSIONAL ENGINEER ALBERTA KERNON BROWN
DATE 2017-10-27

CHECKER
PROFESSIONAL ENGINEER ALBERTA ALBERT KOON-SUN LAW
DATE 2017-10-26

REV	DATE	REVISION	BY
5			
4			
3			
2	2017-10-16	NDC-0042 & CAD COMMENTS	VB
1	2017-09-13	NDC-PAR-DRA-0028	VB

Alberta Transportation

HWY 201:06
SOUTHWEST CALGARY RING ROAD
DRAINAGE PLAN
ALIGNMENT L100
STA 3+600 TO STA 5+040

DATE	LOCATION	SITE	CONTRACT	HIGHWAY	SHEET	DRAWING
2017-07-07	NA	NA	16944	201:06	OF	03_DR_010

476002_03_DR_010.dgn

10/20/2017

APPENDIX B

Historical Aerial Photos

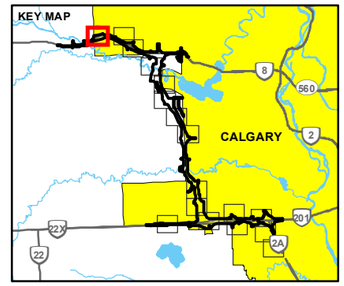
693500
694000
694500
695000
5655500
5655000
5654500

W01
W02
W03

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT

KGL CONSULTING

PROJECT

SOUTHWEST CALGARY RING ROAD

TITLE

1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-1

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

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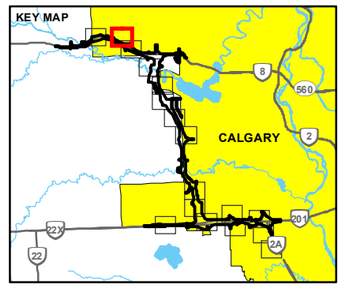
W04
W04

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1927 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
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PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-2

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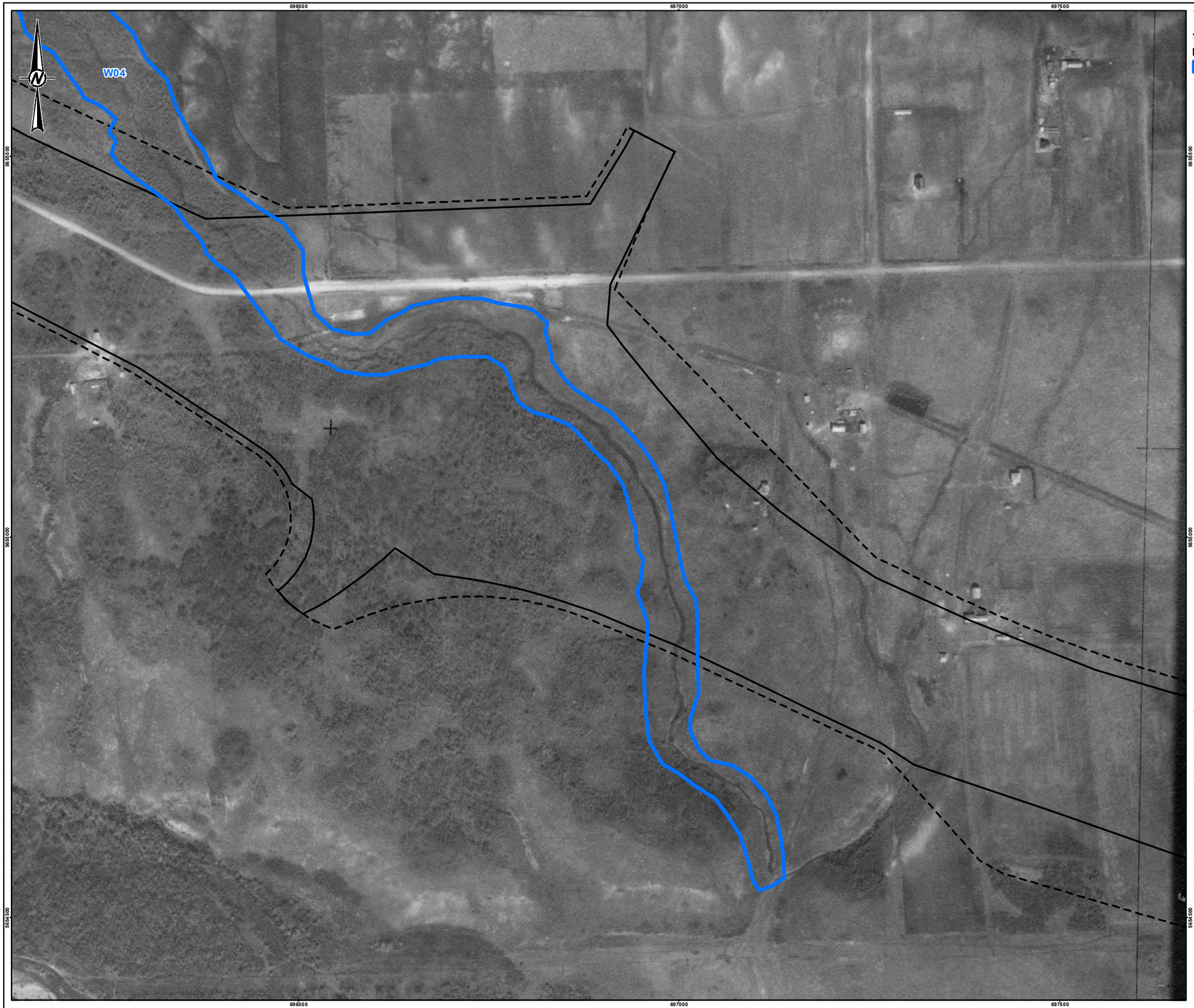
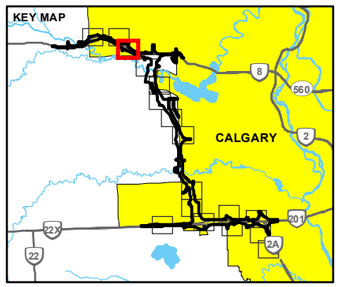


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1927 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-3

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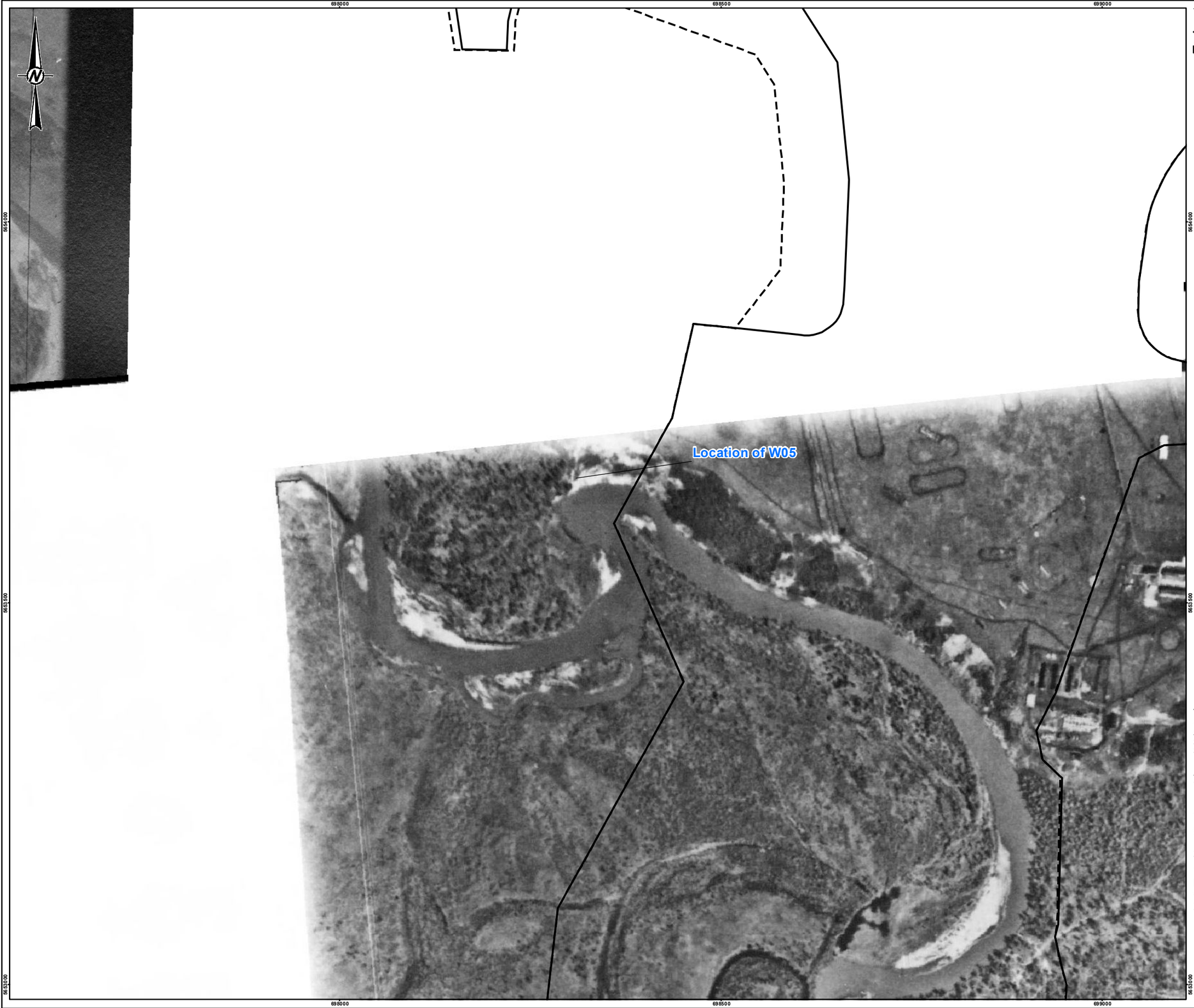
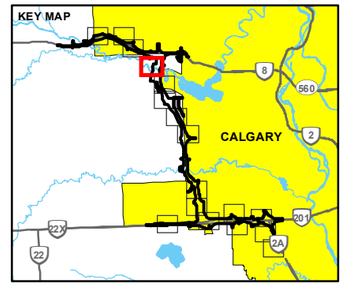


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR

KEY MAP



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

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DESIGNED	AO
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REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-4

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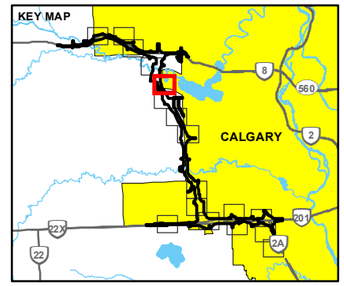
W06
WC01
W07 & W08

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1926 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-5

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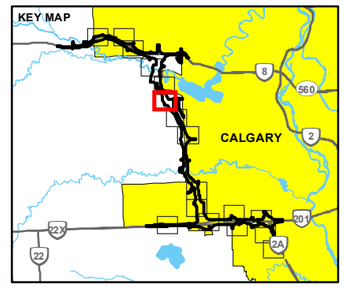
W07 & W08
WC0.1
WC01
W09

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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CLIENT
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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
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REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-6

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700000
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5649500

W10
W11 & W12

LEGEND
RIGHT OF WAY BOUNDARY
TRANSPORTATION UTILITY CORRIDOR
WETLAND

KEY MAP
CALGARY
8
560
2
22X
201
2A
22

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REFERENCE(S)
1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100
REV. 0
FIGURE A-7

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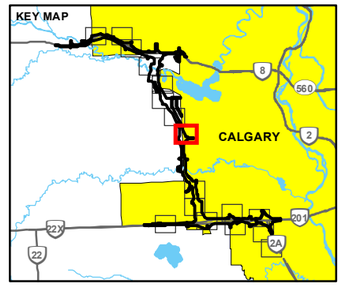
W11 & W12

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT

KGL CONSULTANTS

PROJECT

SOUTHWEST CALGARY RING ROAD

TITLE

1926 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-8

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

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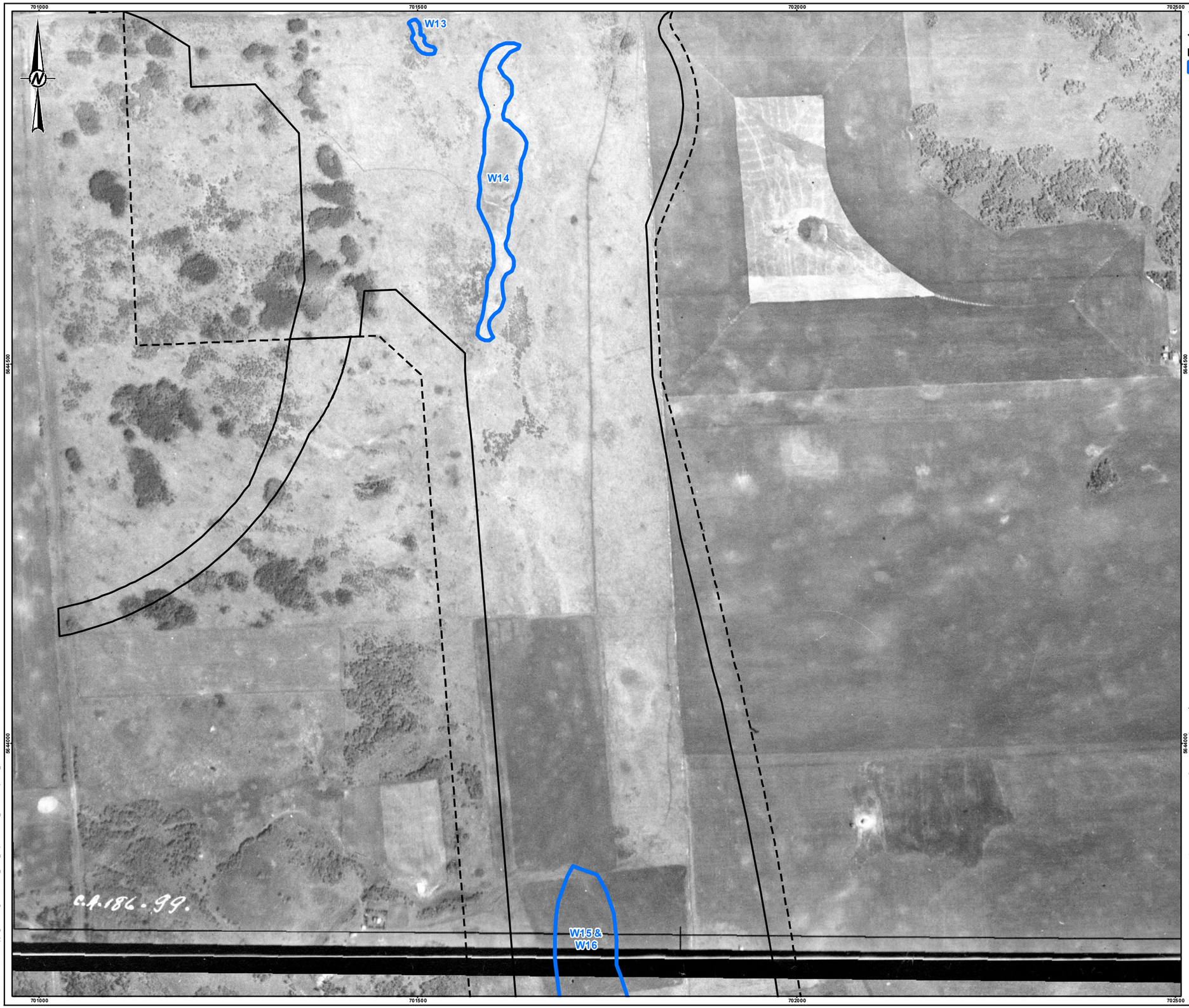
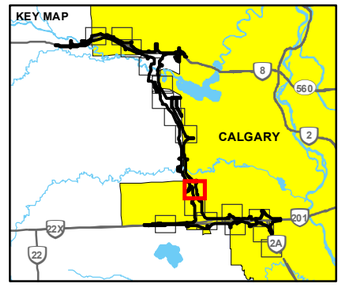


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-9

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

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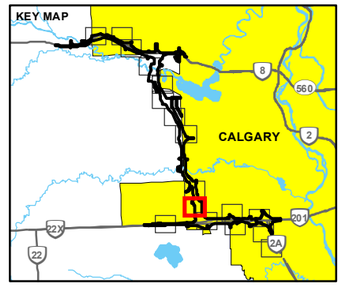
701000
701500
702000
702500
5643500
5642500

W15 &
W16

WC02

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS LTD.

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-10

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

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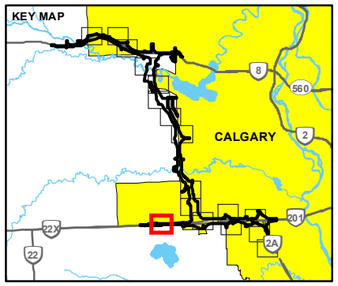
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CANADA LTD.

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-11

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

25mm

0

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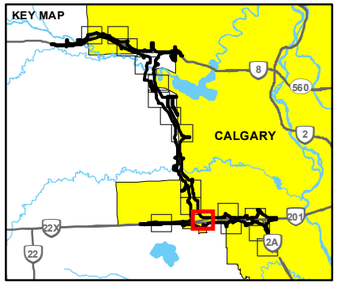
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-12

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

0 25mm

704000
704500
705000
5643500
5642500
5642000

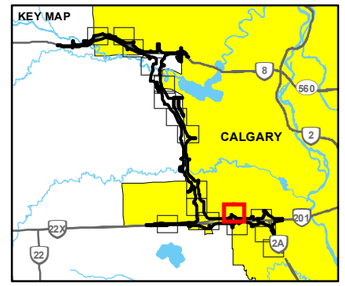
W22

W24

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-13

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

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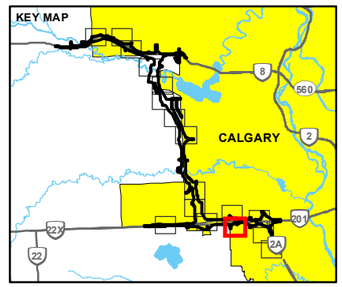
PATH: I:\2014\1-4\08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1920a.mxd PRINTED ON: 2018-03-23 AT: 3:16:20 PM

704500
705000
705500
5642000
5641500
5641000

W22
W23
W24
W25

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-14

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

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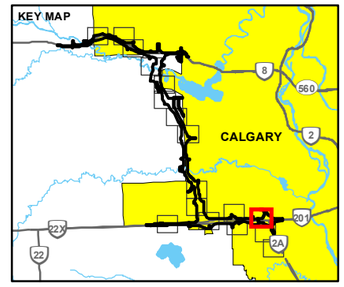
706000
706500
707000
5642500
5642000

W26
W27
W28
W29 & W30
W31
W32

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-15

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

0 25mm

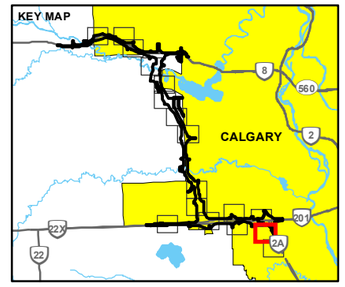
PATH: I:\2014\1140866\3Mapping\MXD\Vegetation\WAR_2018_Report\1789100_Historic#Airphotos_1920s.mxd PRINTED ON: 2018-03-23 AT: 3:17:20 PM

706500
707000
707500
5641500
5641000
5640500

W29
& W30
W32
W31
W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-16

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

0 25mm

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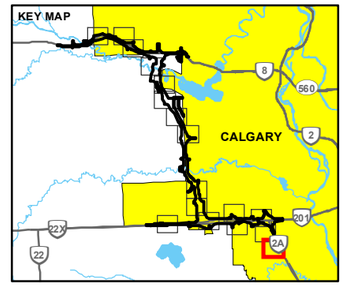
707000
707500
708000
5640500
5640000
5639500

W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1920 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-17

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

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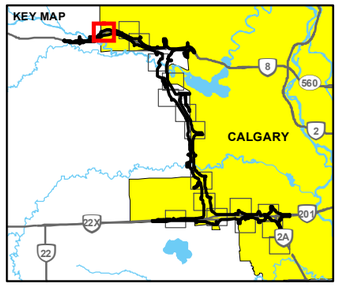
694000
694500
695000
5655500
5655000
5654500

W03

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT

KGL CONSULTANTS

PROJECT

SOUTHWEST CALGARY RING ROAD

TITLE

1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-18

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

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696000
696500
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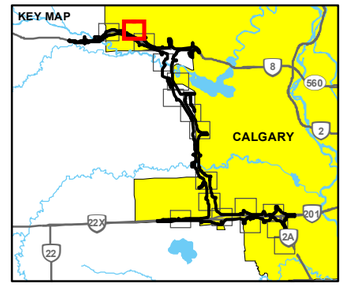
5655500

W04

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-19

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

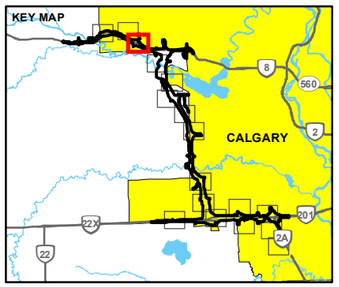
25mm

0

PATH: I:\2014\1-1408636\3-Mapping\MXD\Vegetation\WAR_2018_Report\1789100_Historic aArphotos_1950a.mxd PRINTED ON: 2018-03-23 AT: 3:14:03 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-20

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

0 25mm

PATH: I:\2014\1406865\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_Historic aAirphotos_1960s.mxd PRINTED ON: 2018-03-23 AT: 3:14:50 PM

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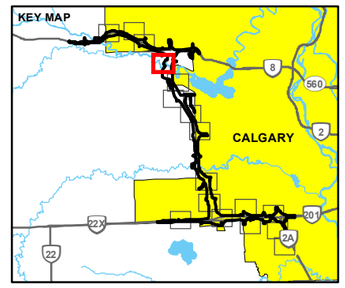
698500
699000
5654000
5653500
5653000

W05

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-21

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

0 25mm

PATH: I:\2014\14\09\80\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 3:15:38 PM

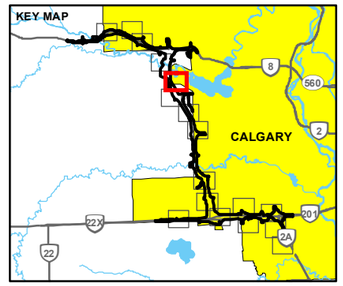
699000
699500
700000
5652500
5652000

W06
W07 & W08
WC01

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-22

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

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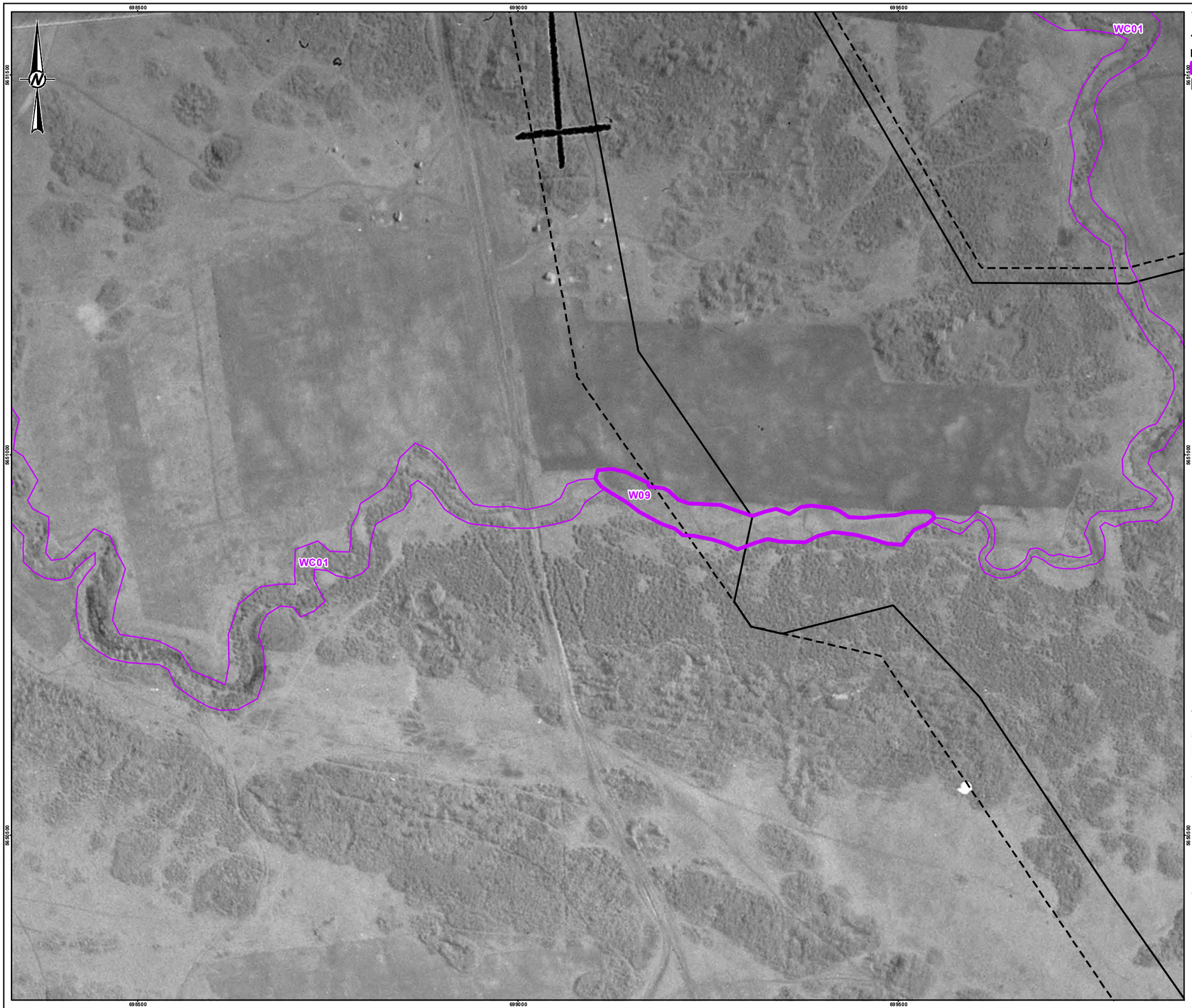
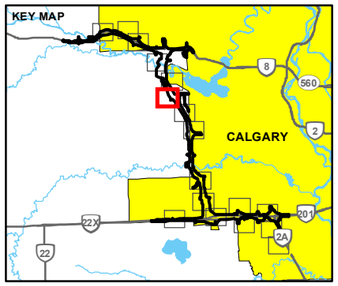
PATH: I:\2014\4\4\0868\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 3:16:30 PM



LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANT

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-23

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

25mm

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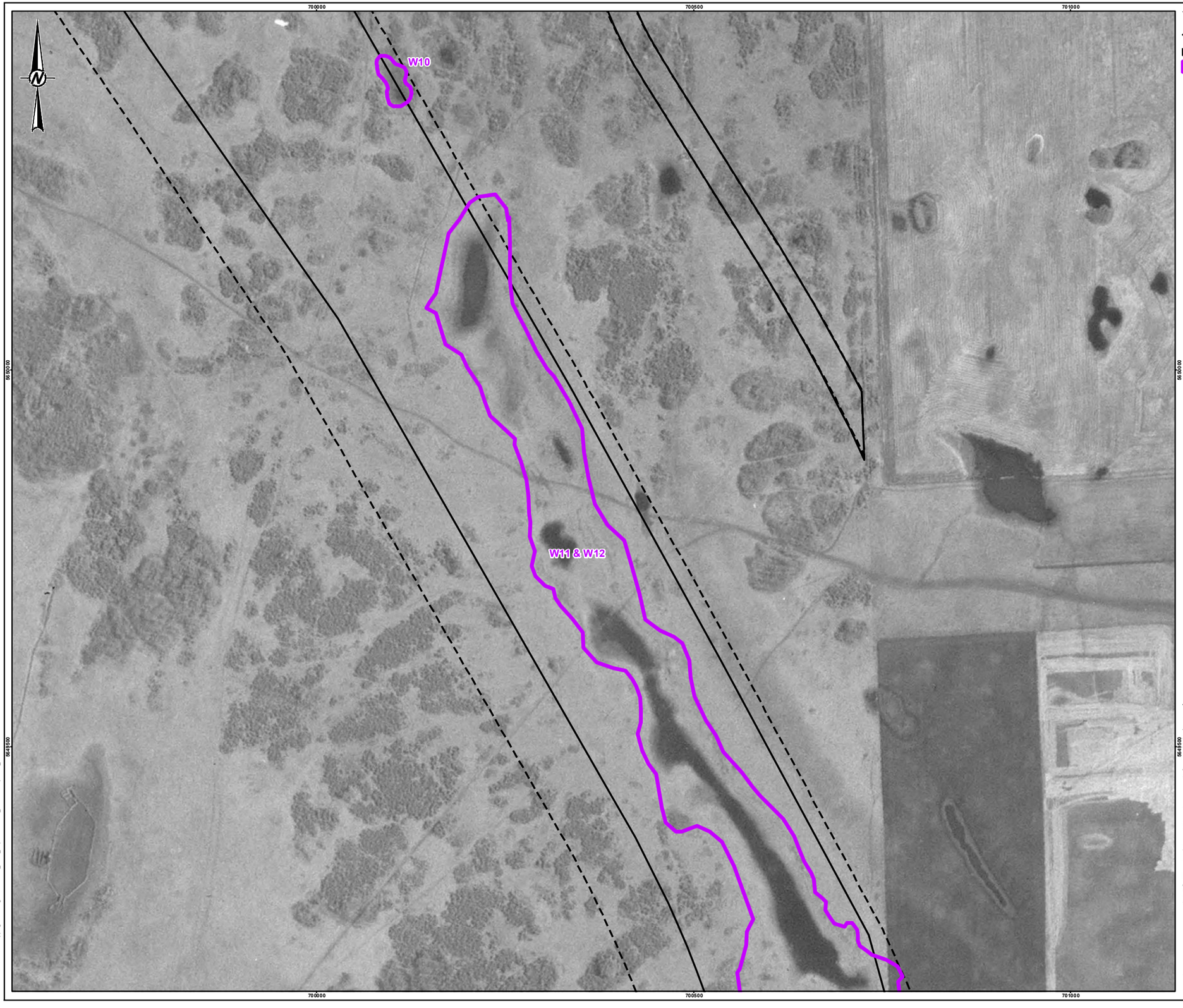
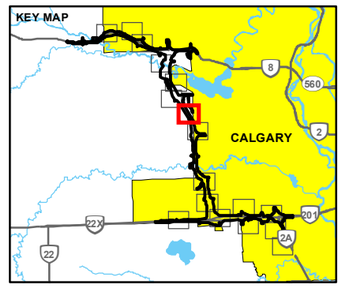


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-24

PATH: I:\2014\1149\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 3:17:29 PM

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

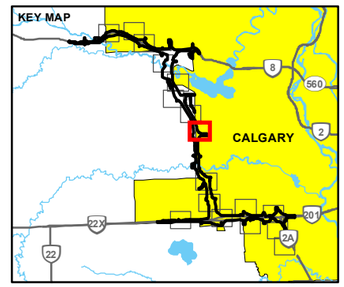
0 25mm

700500
701000
701500
5649000
5648500
5648000

W11 & W12

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-25

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

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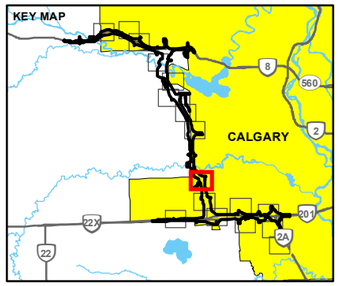
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-26

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

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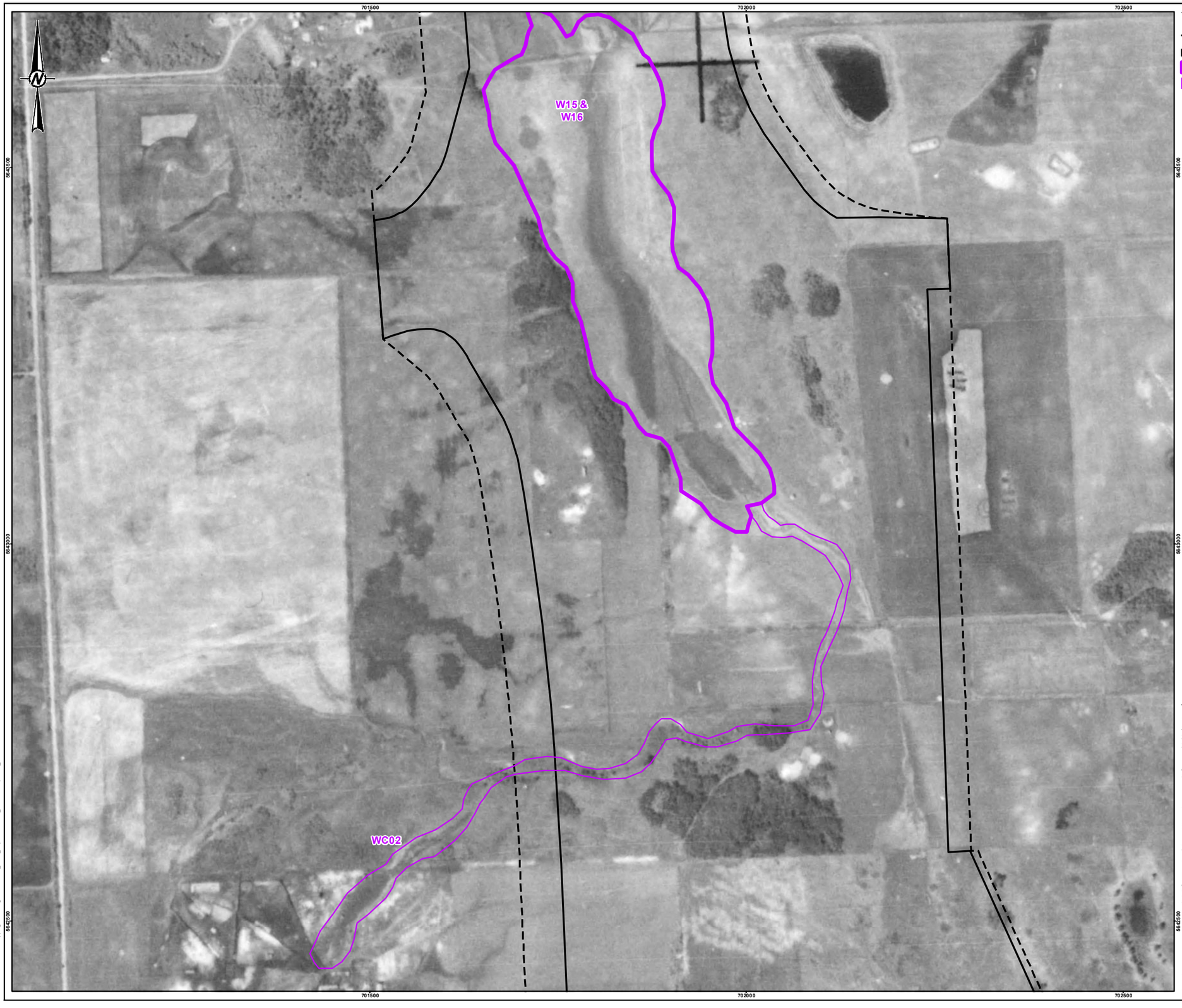
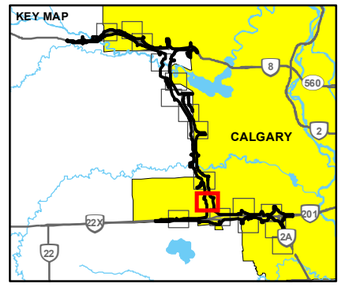


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

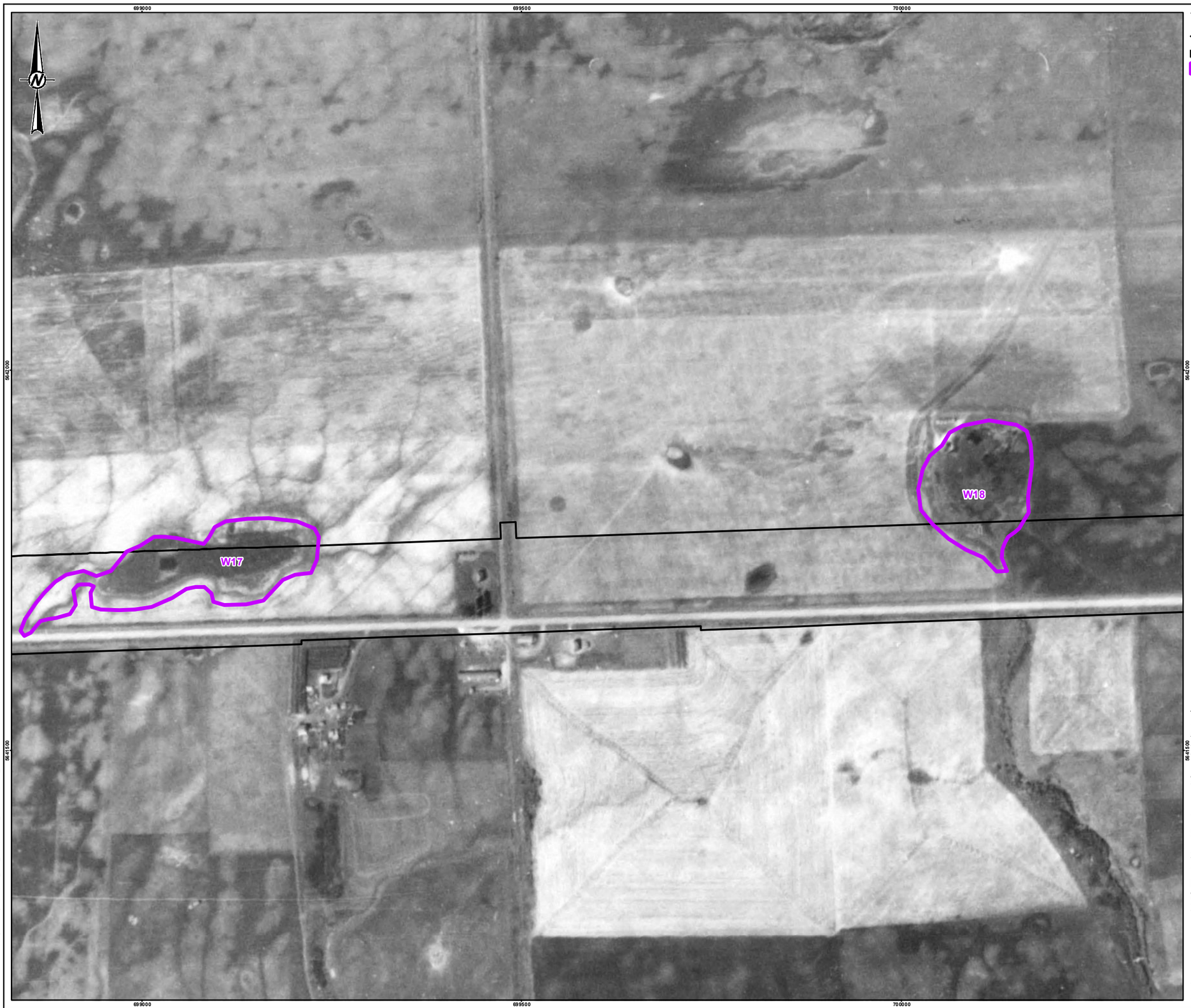
YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-27

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

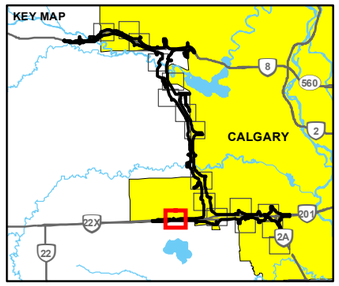
0 25mm

PATH: I:\2014\1408\08\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_Historic#Airphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 3:18:49 PM



LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1950 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-28

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

25mm

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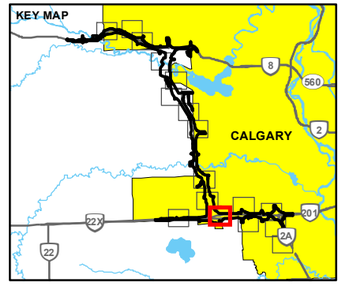
PATH: I:\2014\4\43\806\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 3:19:17 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS LTD.

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1951 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-29

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

25mm

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705000
5643000
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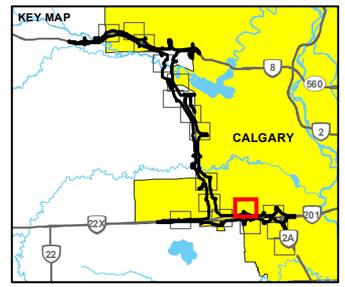
W22

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1951 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-30

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

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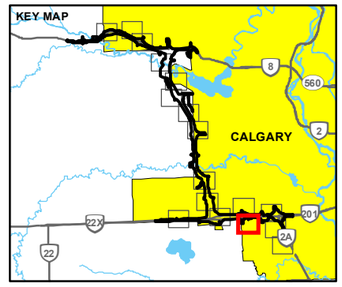
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT

KGL CONSULTANTS

PROJECT

SOUTHWEST CALGARY RING ROAD

TITLE

1951 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-31

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

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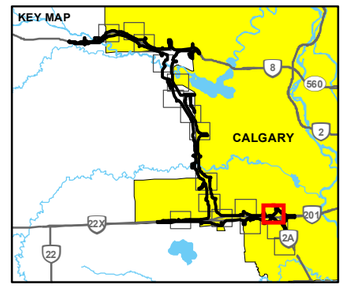
706000
706500
707000
5642500
5642000

W26
W27
W28
W29 & W30
W31
W32

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1951 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-32

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

25mm

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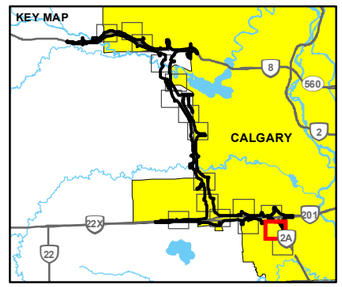
PATH: I:\2014\1-40863\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 3:20:54 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSEIL DV GT

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1951 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-33

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

0 25mm

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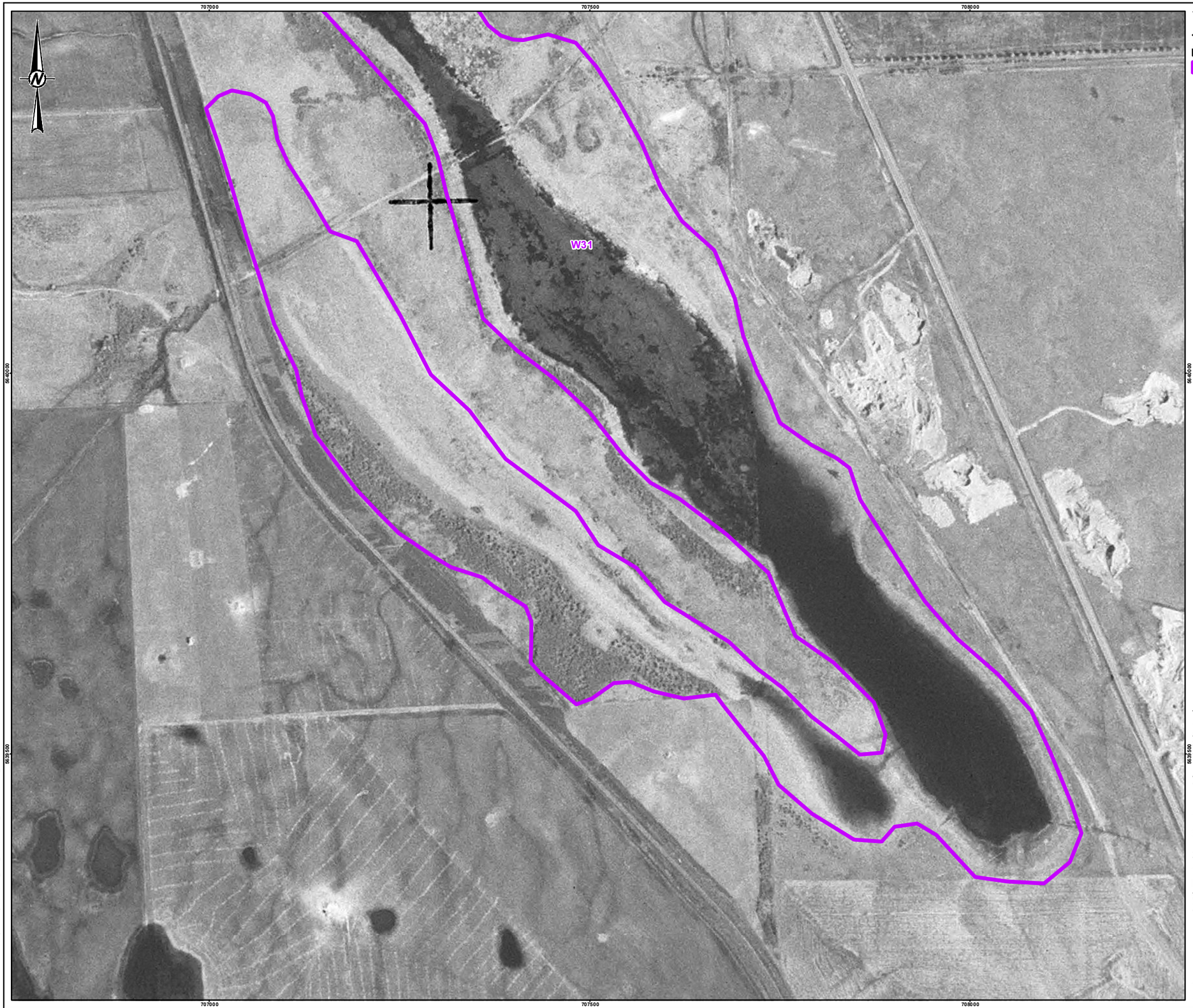
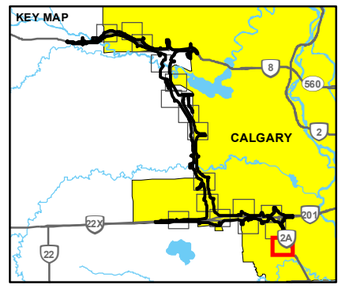


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1951 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-34

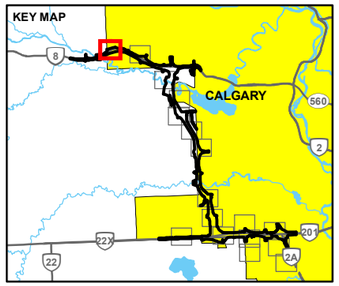
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25mm

PATH: I:\2014\1-60863\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1950s.mxd PRINTED ON: 2018-03-23 AT: 12:31 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-35

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

0 25mm

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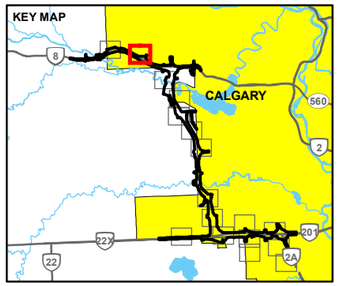
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-36

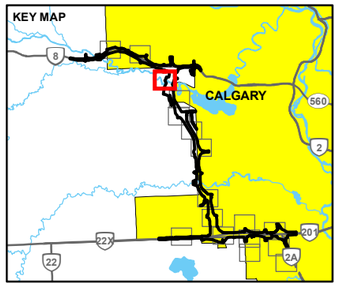
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:46:35 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-37

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

25mm

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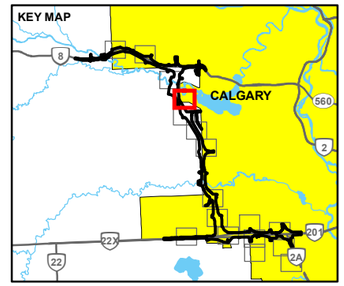
PATH: I:\2014\4.08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:47:21 PM

699000
699500
700000
5652500
5652000

W06
W07 &
W08
WC01

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-38

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

0 25mm

PATH: I:\2014\4.08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:47:52 PM

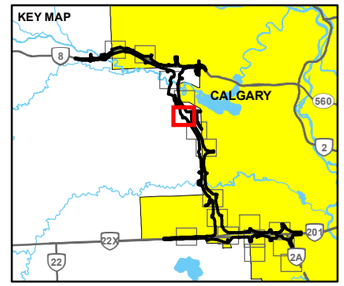
699000
699500
700000
5651500
5651000
5650500

WC01
WC01
W09
W10

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-39

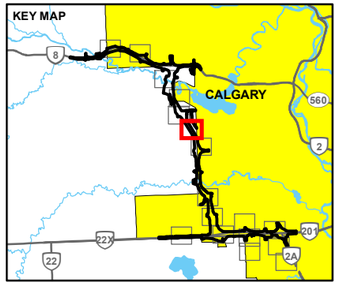
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

PATH: I:\2014\4.08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:48:25 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1962 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-40

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

25mm

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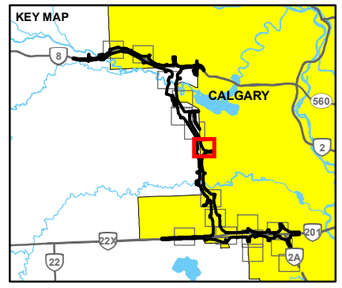
PATH: I:\2014\1408663\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1962s.mxd PRINTED ON: 2018-03-20 AT: 2:48:50 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1962 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-41

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

0 25mm

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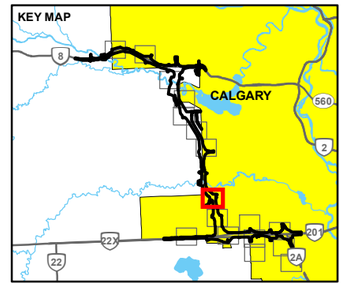
701000
701500
702000
5645000
5644500

W13
W14

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-42

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

25mm

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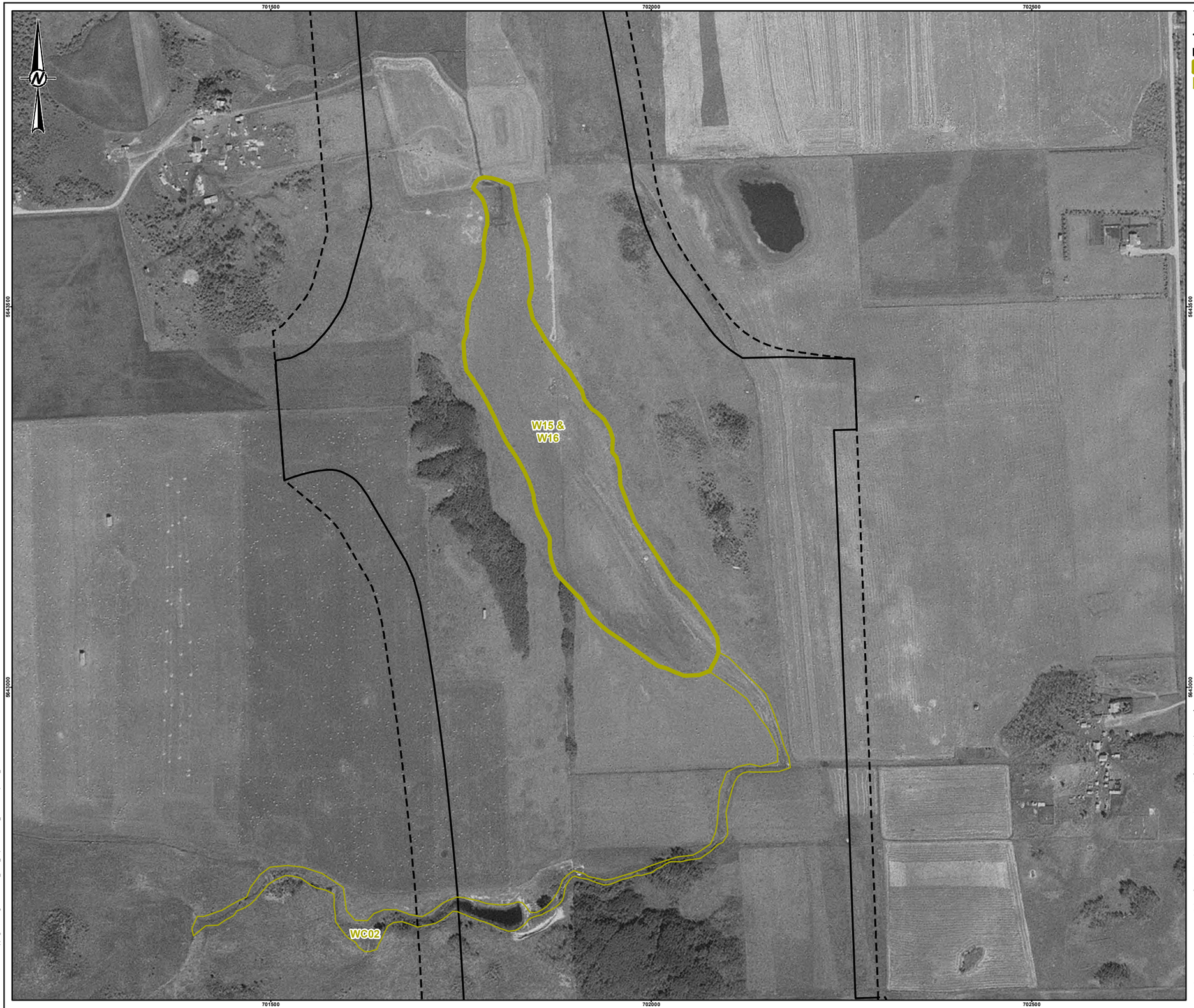
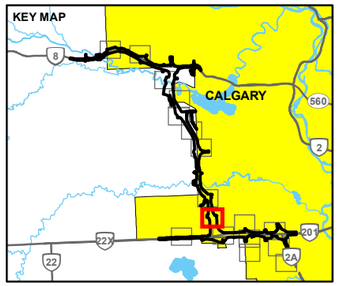


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-43

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

25mm

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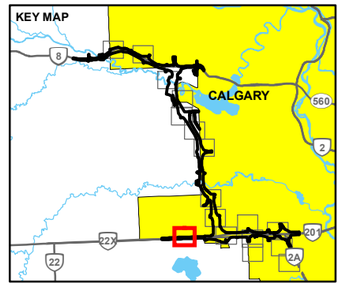
PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:50:05 PM

699000
699500
700000
5642000
5641500

W18
W17

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-44

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

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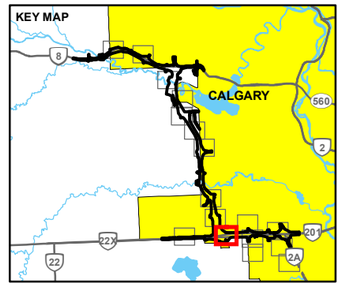
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-45

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

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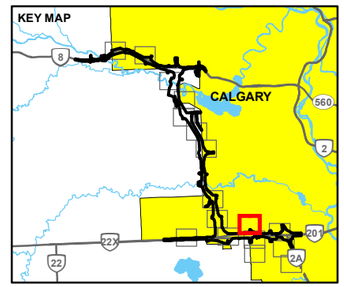
704000
704500
705000
5643000
5642500

W22

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-46

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

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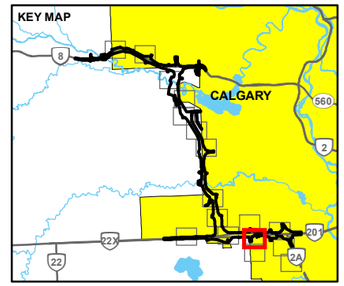
704000
704500
705000
5642000
5641500

W22
W24
W25
W23

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-47

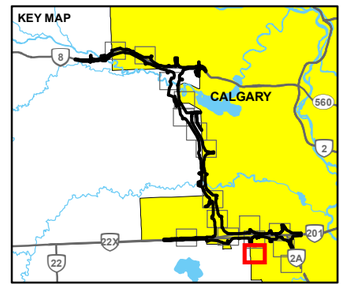
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4\08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:51:46 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-48

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

0 25mm

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:52:07 PM

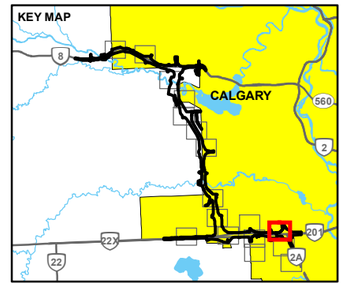
706000
706500
707000
5642500
5642000

W26
W27
W28
W29
W30
W31
W32

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-49

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

0 25mm

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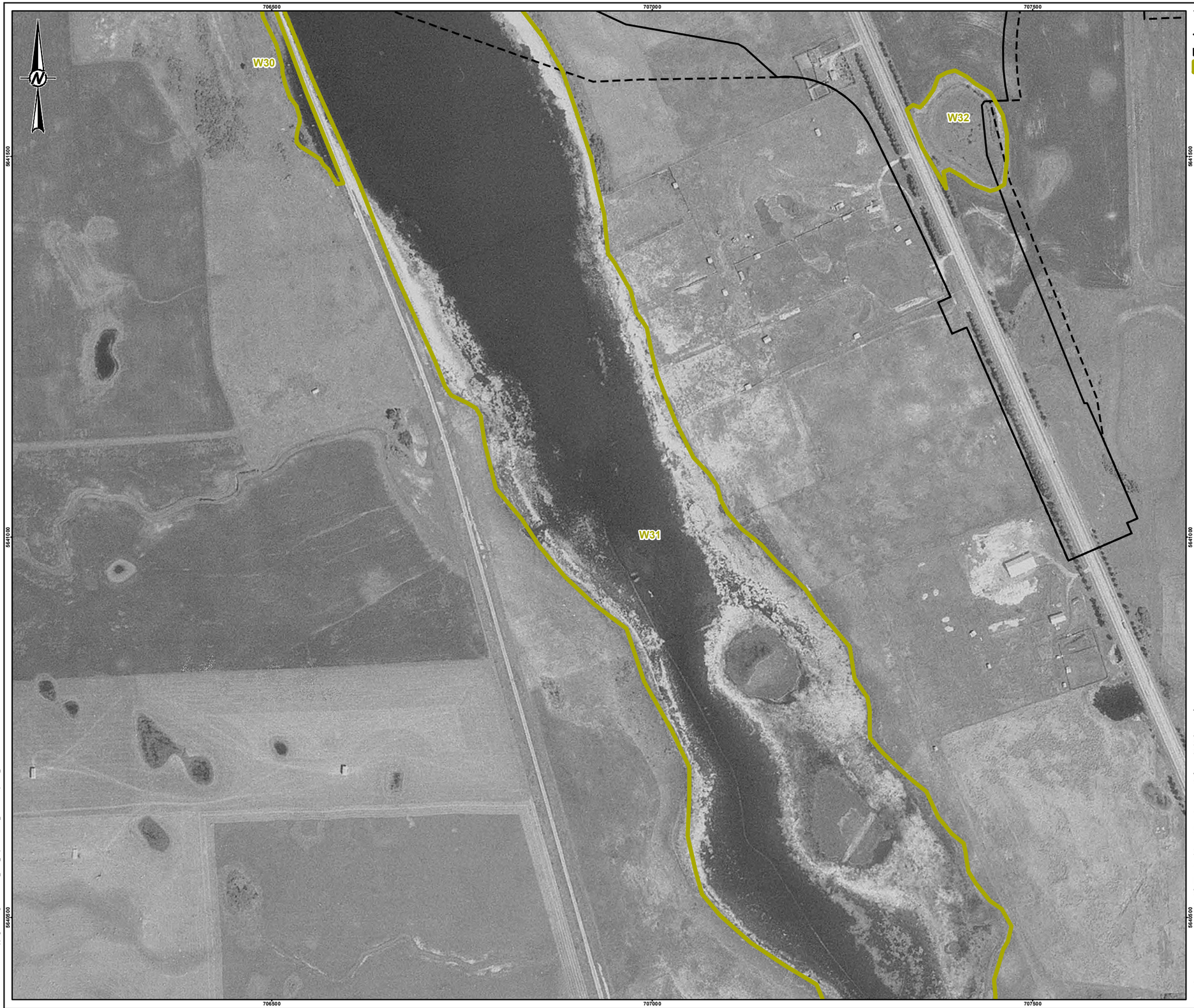
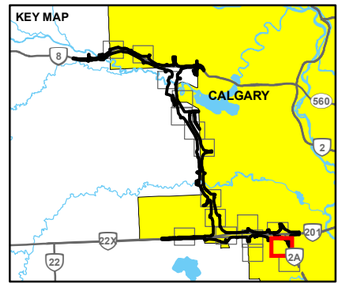


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-50

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

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PATH: I:\2014\4.08663\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT: 2:52:56 PM

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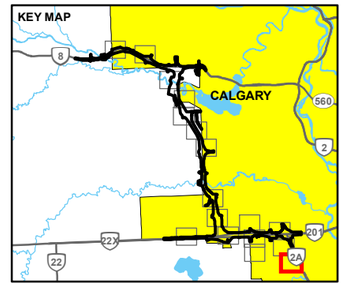
707500
708000
5640000
5639500

W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1966 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-51

PATH: I:\2014\1408603\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1960s.mxd PRINTED ON: 2018-03-20 AT 2:53:24 PM

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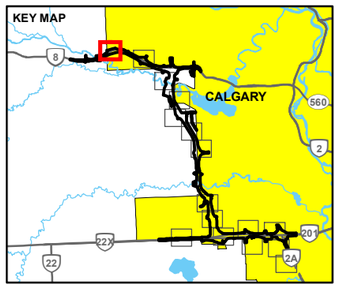
0 25mm

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-52

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

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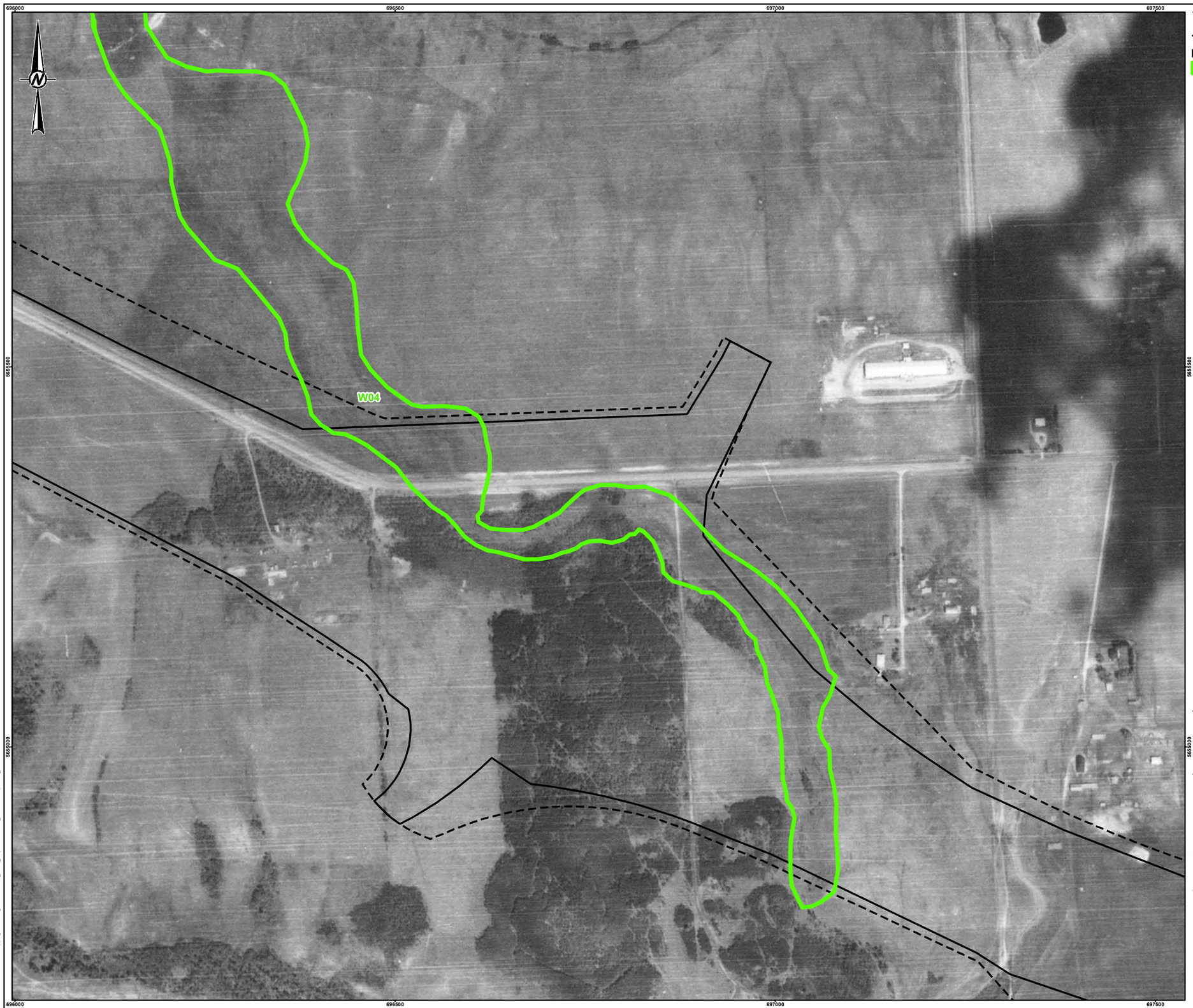
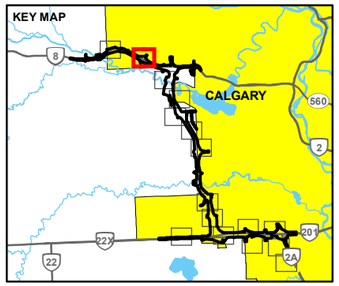


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-53

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

25mm

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PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:44:20 PM

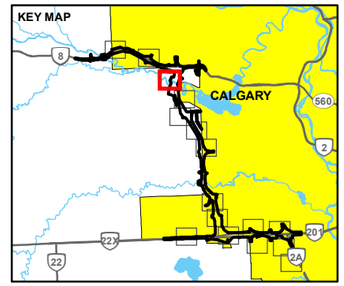
698000
698500
699000
5664000
5663500
5663000

W05

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-54

PATH: I:\2014\1408863\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:44:45 PM

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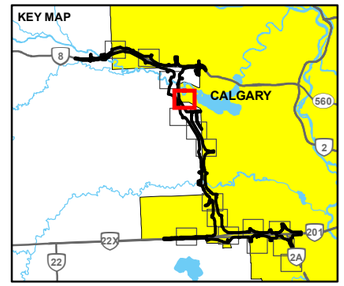
0 25mm

699000
699500
700000
5652500
5652000

W06
W07 & W08
WC01

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-55

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

25mm

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PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:45:11 PM

698500
699000
699500
5651500
5651000
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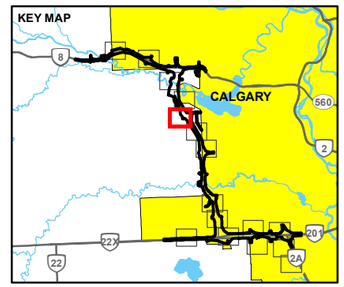
W09
WC01
WC01

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-56

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

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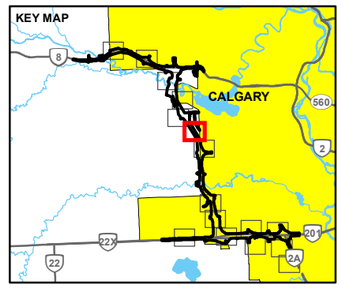
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-57

PATH: I:\2014\1408663\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT 2:45:54 PM

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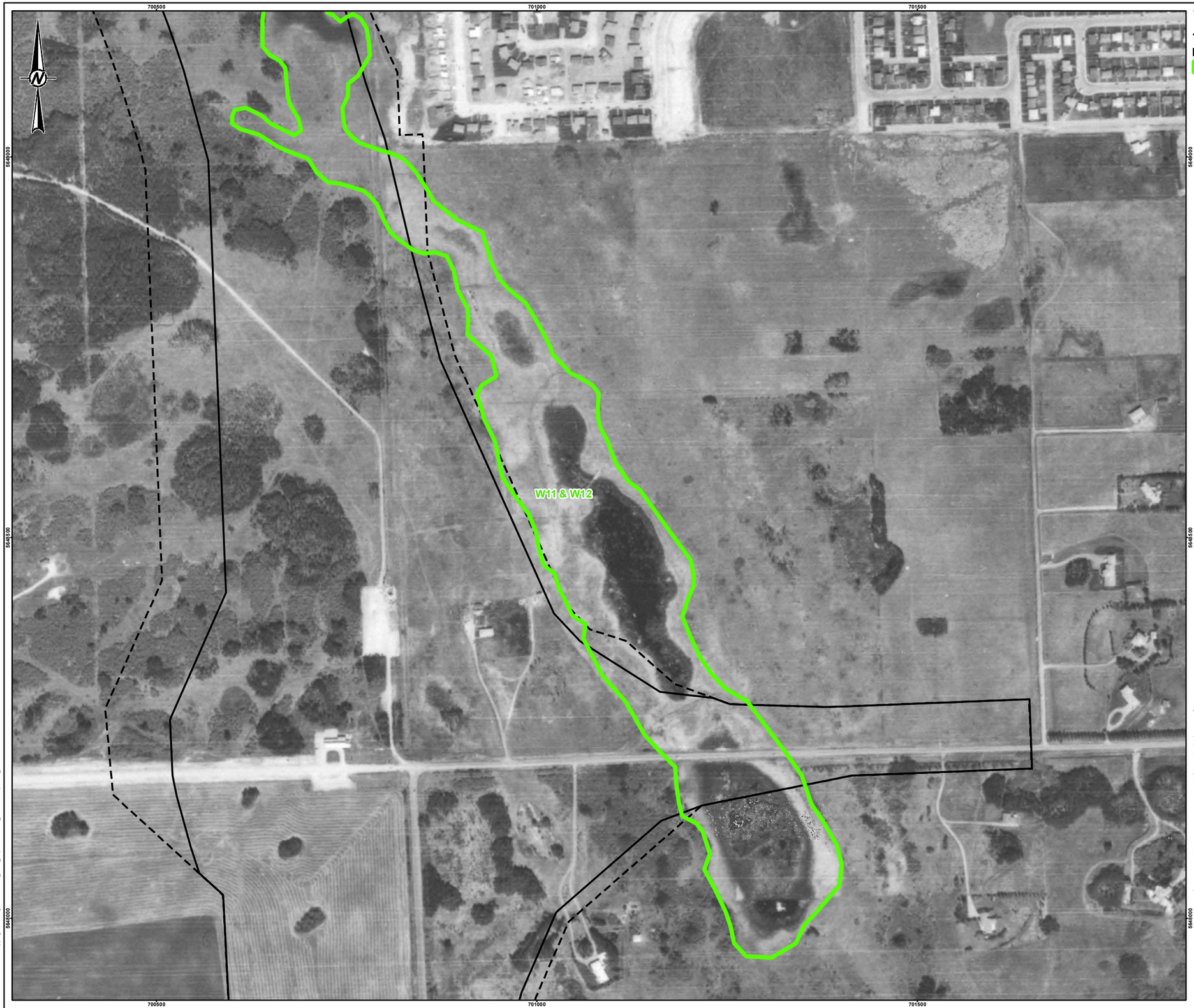
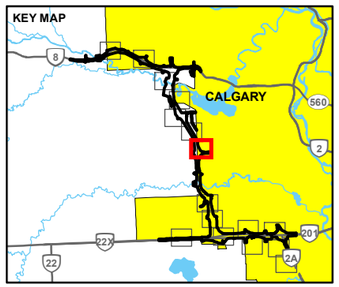


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1974 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-58

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

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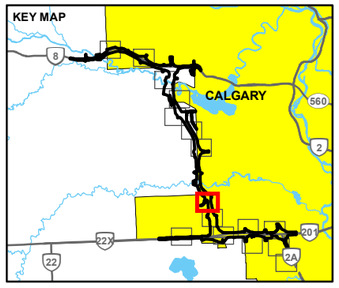
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-59

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

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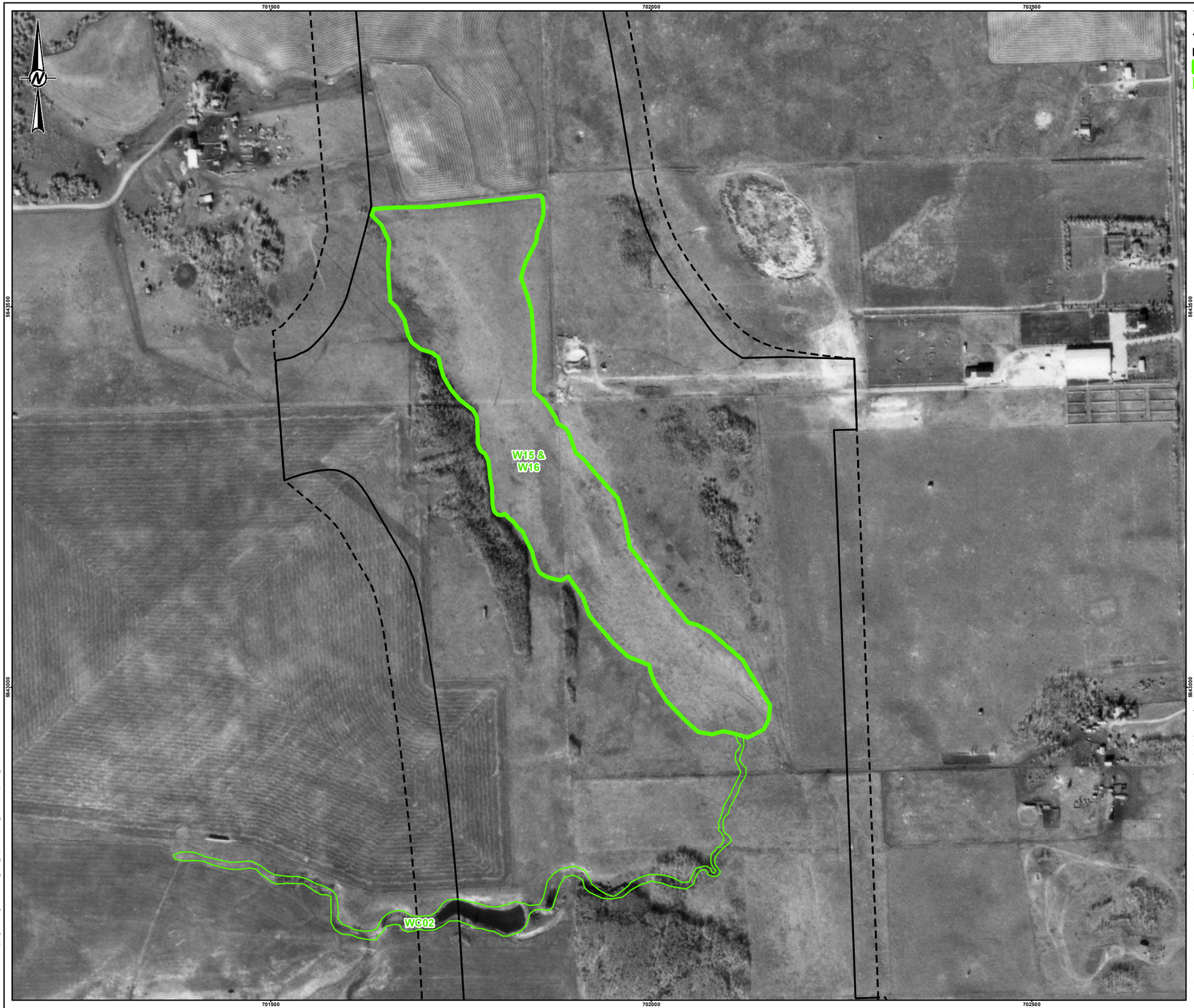
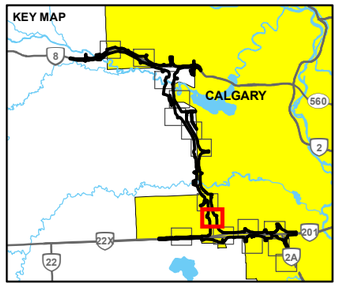


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-60

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

25mm

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PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:47:11 PM

699000
699500
700000
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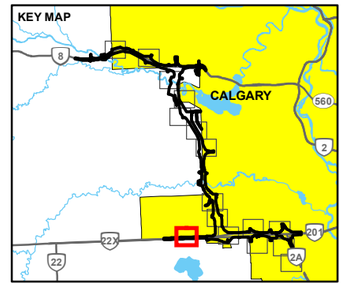
5641500

W17
W18

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-61

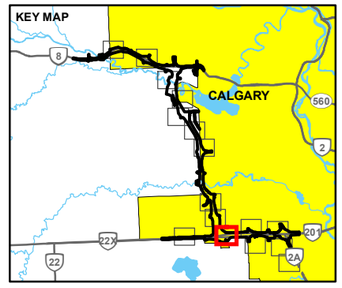
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:47:28 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-62

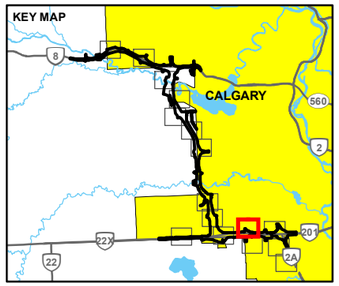
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4\08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT 2:47:51 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

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CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-63

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

25mm

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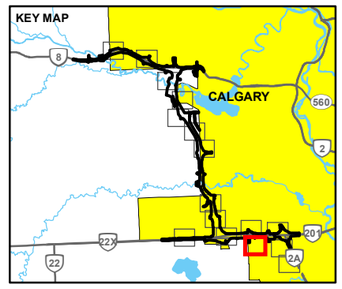
PATH: I:\2014\4\08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:48:26 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



0 100 200

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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-64

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

0 25mm

PATH: I:\2014\1\08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1970s.mxd PRINTED ON: 2018-03-20 AT: 2:48:57 PM

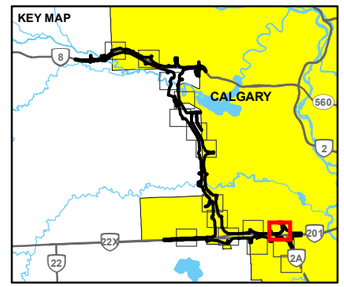
706000
706500
707000
5643500
5642000

W26
W27
W28
W29 &
W30
W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1977 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-65

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

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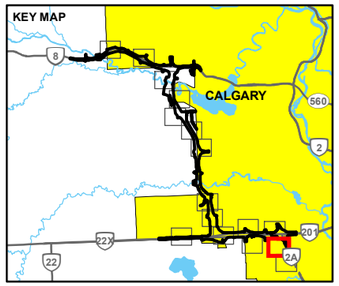
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1976 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-66

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

25mm

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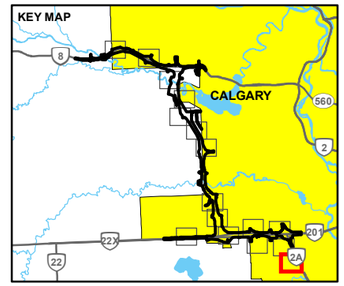
707000
707500
708000
5640000
5639500

W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1976 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-67

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

25mm
0

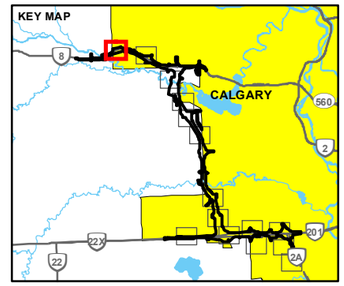
693500
694000
694500
695000
5655500
5656000
5656500
5657000

W01
W02
W03

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1984 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-68

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

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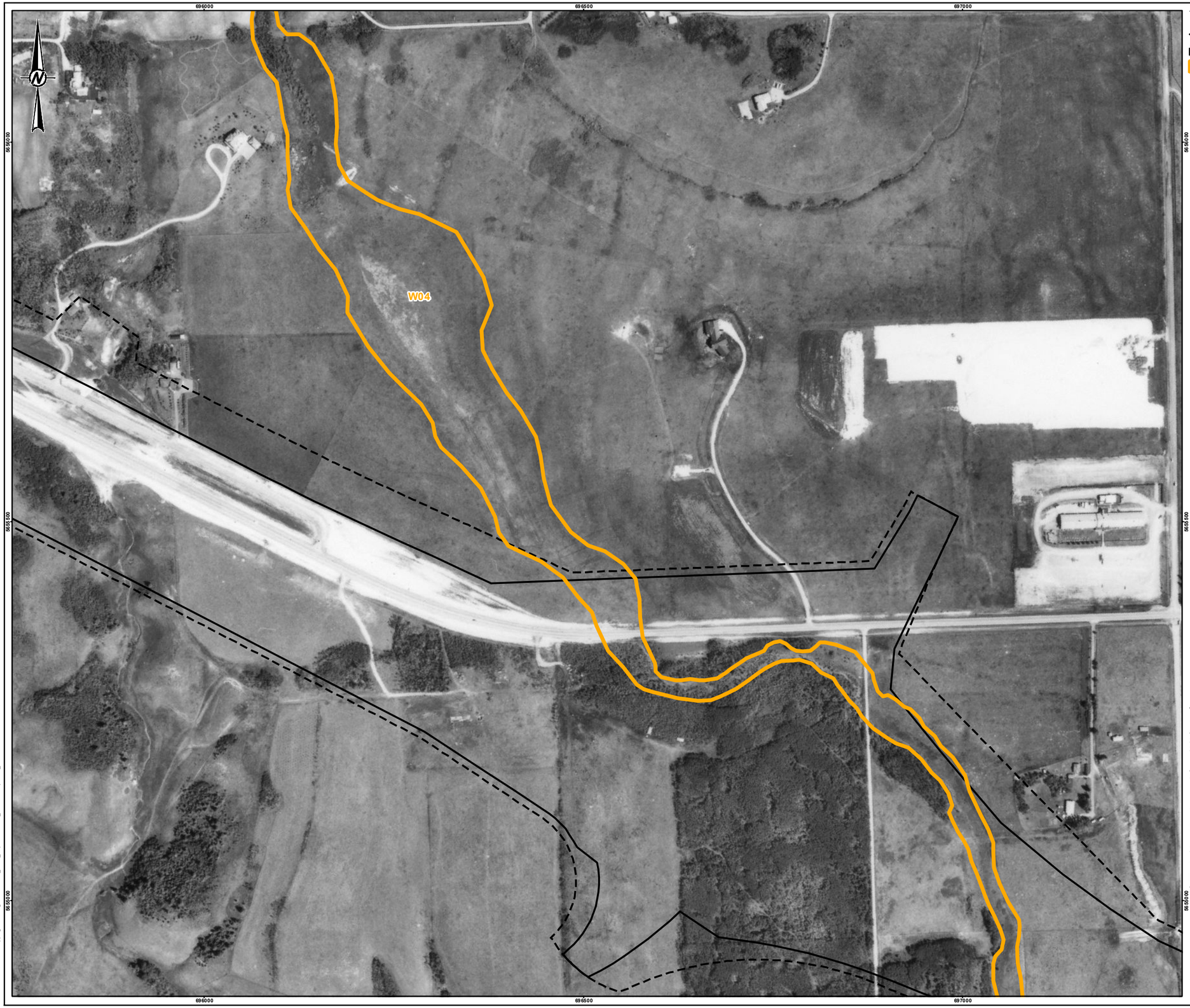

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

0 100 200

1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1984 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-69

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

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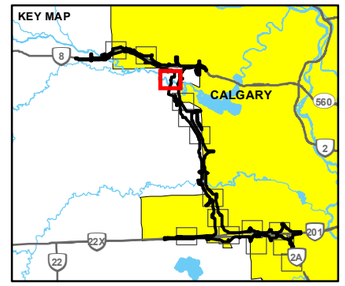
698000
698500
699000
5654000
5653500
5653000

W05

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS INC.

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1984 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-70

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

25mm

0

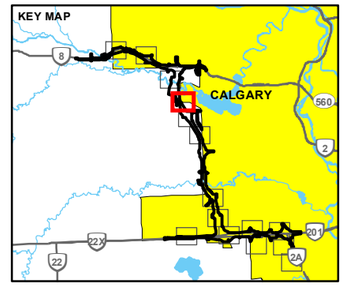
PATH: I:\2014\1-ABM\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1984a.mxd PRINTED ON: 2018-03-23 AT: 3:01:23 PM

699000
699500
700000
5652500
5652000
5651500

W06
W07 & W08
WC01

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1984 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-71

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

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PATH: I:\2014\1\40866\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1984s.mxd PRINTED ON: 2018-03-23 AT: 3:02:18 PM

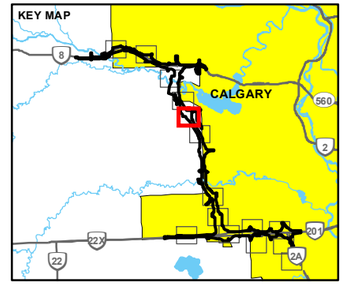
699000
699500
700000
5651000
5650500

WC01
W09
W10
W11

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1984 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-72

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

0 25mm

PATH: I:\2014\1\140866\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_Historic aerial photos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:03:58 PM

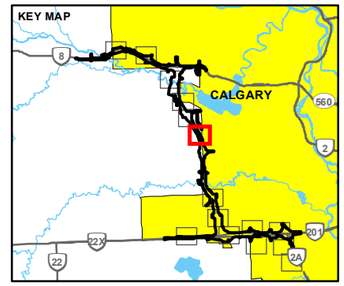
700000
700500
701000
5650000
5649500
5649000
5648500

W11
W12

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANT

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1984 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-73

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

0 25mm

PATH: I:\2014\1-0\0863\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:05:51 PM

701000
701500
702000
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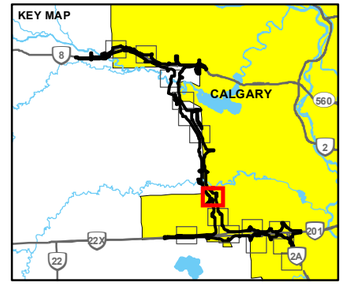
5644500

W13
W14

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-74

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B
0 25mm

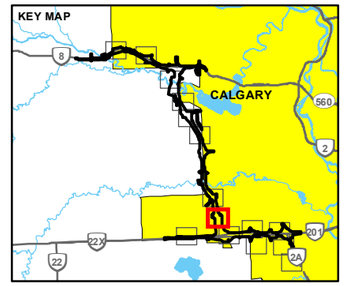
PATH: I:\2014\1408863\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_Historic#Aerphotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:06:33 PM

701500
702000
702500
5643500
5643000
5642500

W15
W16
WC02

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-75

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

0 25mm

PATH: I:\2014\1\408963\Mapping\MXD\VegetationWAR_2018_Report\1789100_HistoricAirPhotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:07:28 PM

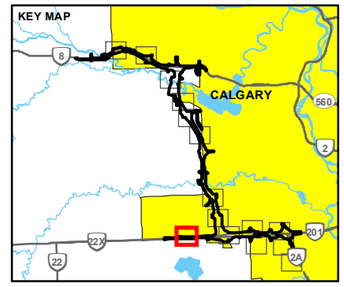
699000
699500
700000
5642000
5641500

W17
W18

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-76

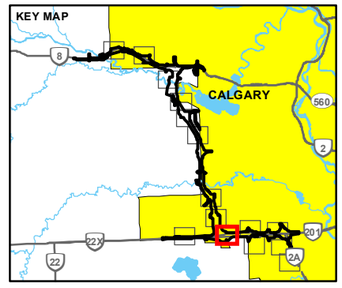
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\1-408963\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:08:36 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTING

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-77

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

0 25mm

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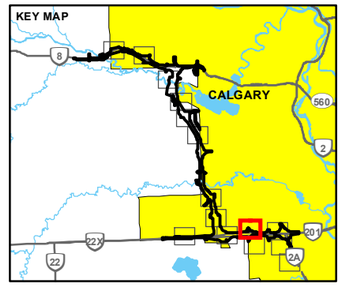
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT

KGL CONSULTANTS

PROJECT

SOUTHWEST CALGARY RING ROAD

TITLE

1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-78

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

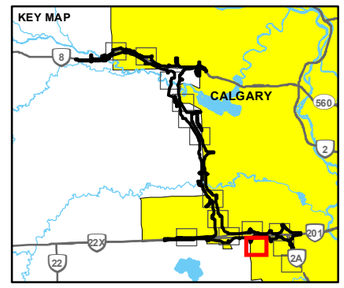
25mm

0

PATH: I:\2014\1\40\86\38\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:10:21 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT

KGL CONSULTING

PROJECT

SOUTHWEST CALGARY RING ROAD

TITLE

1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO.	REV.	FIGURE
1789100	0	A-79

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

25mm

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PATH: I:\2014\4\4\0868\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:11:19 PM

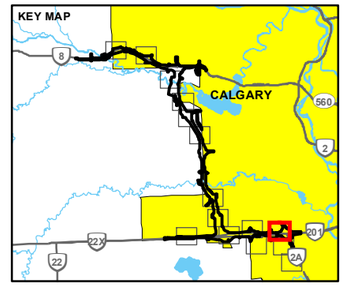
706000
706500
707000
5642500
5642000

W26
W27
W28
W29
W30
W31
W32

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-80

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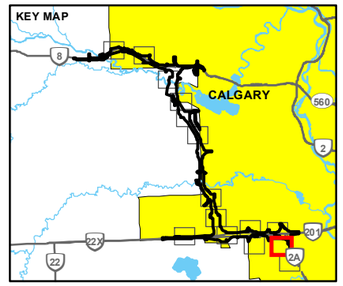
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-81

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

0 25mm

PATH: I:\2014\4\40\866\3\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricAirphotos_1980s.mxd PRINTED ON: 2018-03-23 AT: 3:12:40 PM

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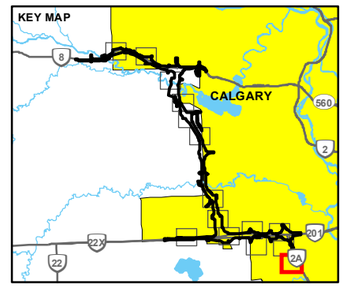
708000
5650000
5649500
W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1982 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-82

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

0 25mm

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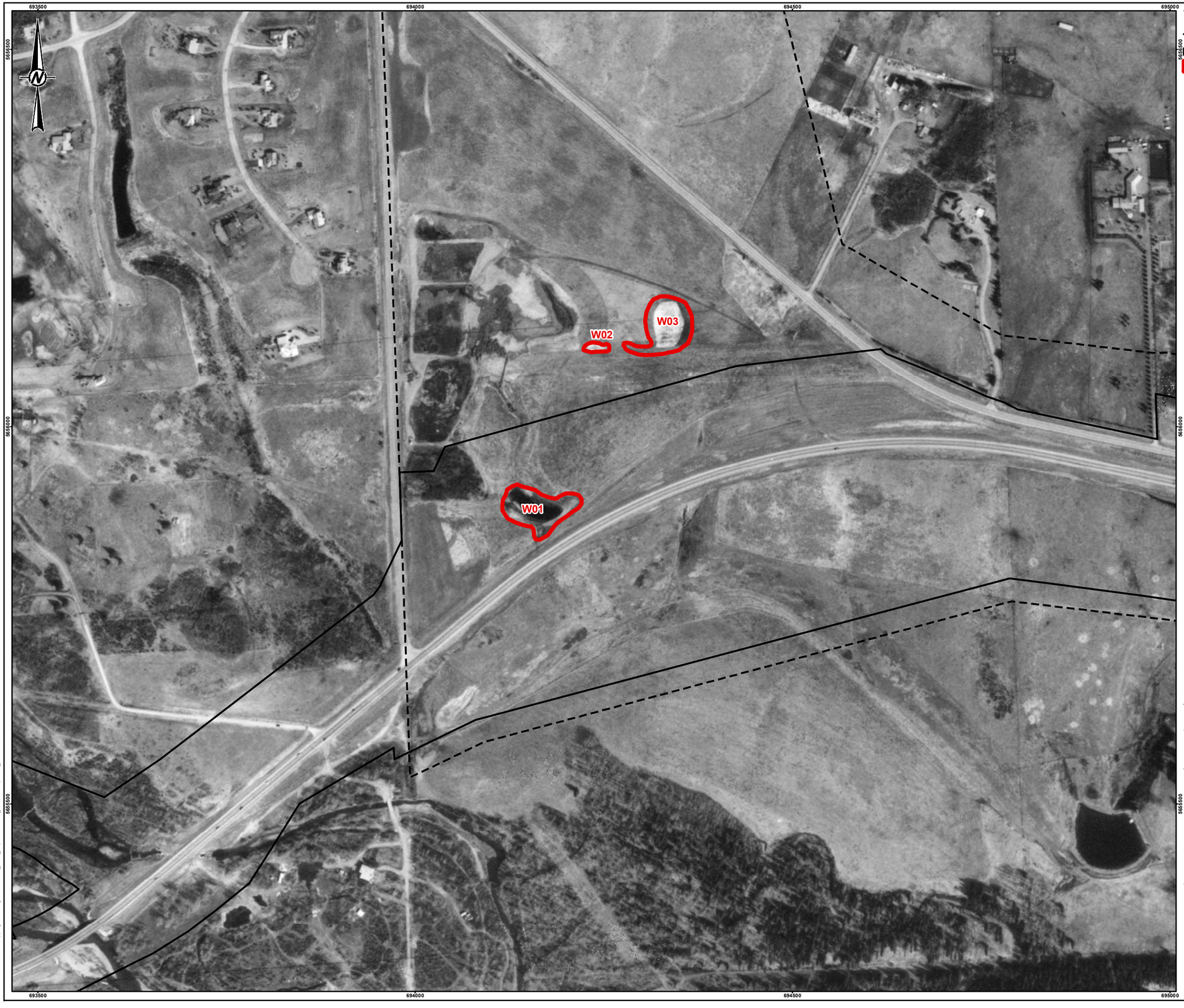
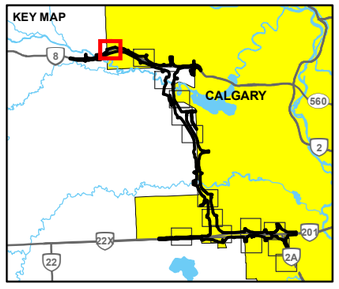


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1993 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-83

PATH: I:\2014\1408663\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:52:42 PM

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

25mm
0

696000 696500 697000 697500

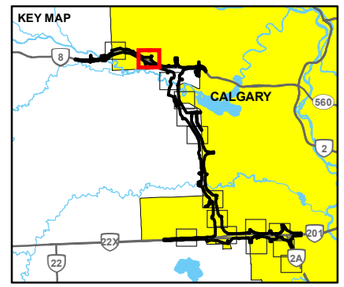
5685500

5685000

W04

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1993 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-84

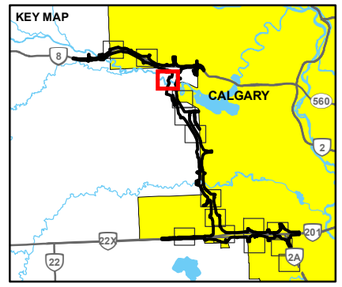
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\1408\63\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:53:32 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1993 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-85

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

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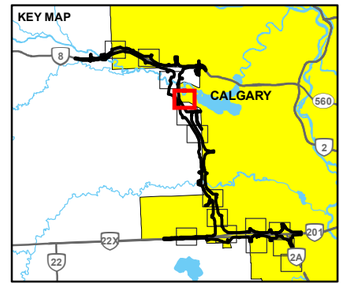
PATH: I:\2014\1409863\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:54:03 PM

699000
699500
700000
5652500
5652000

W06
W07 &
W08
WC01

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1993 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-86

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

0 25mm

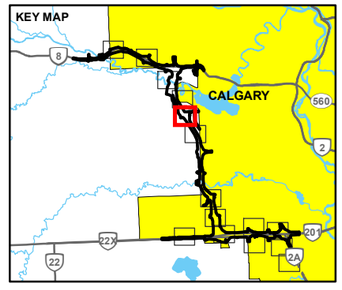
PATH: I:\2014\4\08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:54:26 PM

699000
699500
700000
5651500
5651000
5650500

WC01
W09
WC01
W10

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1993 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-87

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

0 25mm

PATH: I:\2014\4\09\63\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:55:01 PM

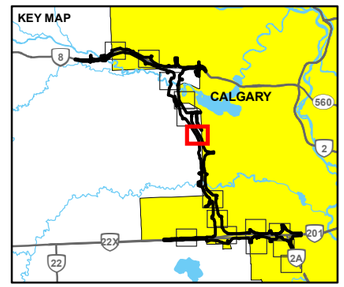
700000
700500
701000
5650000
5649500
5649000

W11
W12

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1999 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-88

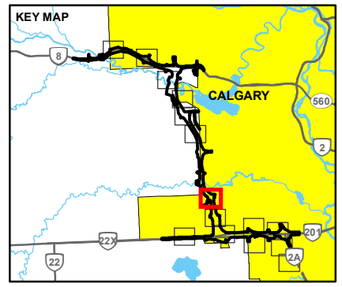
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4\08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:55:33 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-89

PATH: I:\2014\1408635\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1998a.mxd PRINTED ON: 2018-03-20 AT: 2:55:51 PM

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

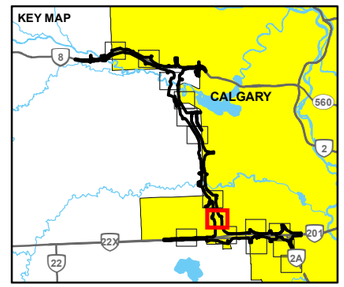
0 25mm

701500
702000
702500
5643500
5643000

W15
W16
WC02

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-90

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

0 25mm

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:56:28 PM

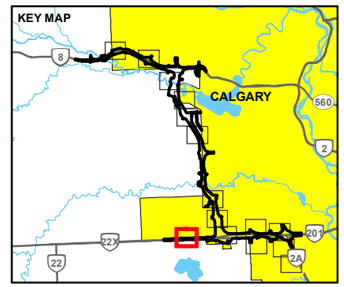
699000
699500
700000
5642000
5641500

W18
W17

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-91

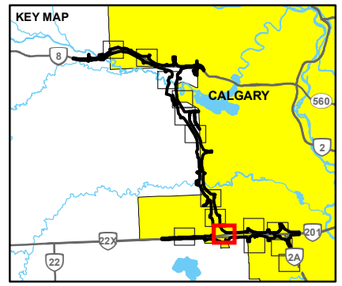
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4.14.08\63\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT 2:56:51 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-92

PATH: I:\2014\1408663\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:57:15 PM

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

0 25mm

704500
705000
705500
6643000
6642500
6642000

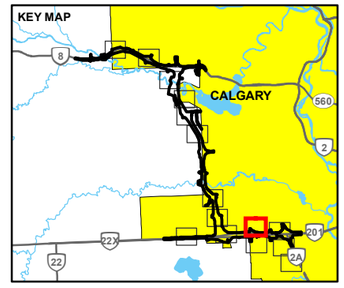
266
454

W22
W24

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-93

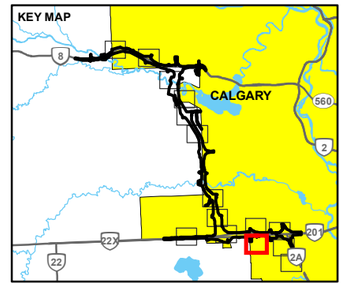
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4.0\08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT 2:57:36 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-94

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

0 25mm

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_1998a.mxd PRINTED ON: 2018-03-20 AT: 2:57:57 PM

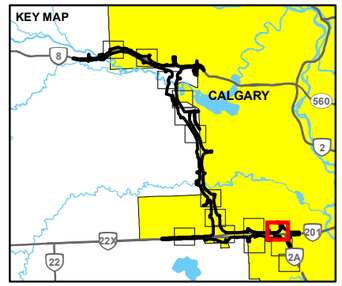
706000
706500
707000
5642500
5642000

W26
W27
W28
W29
W30
W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-95

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

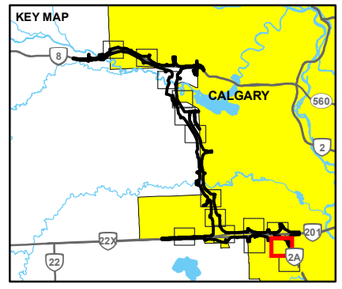
25mm

0

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:58:20 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARSONS KGL

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 | REV. 0 | FIGURE A-96

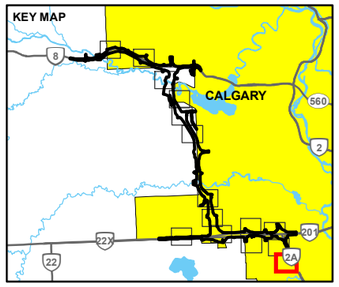
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4.14\08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT 2:58:43 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT
PARS KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
1998 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-97

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

0 25mm

PATH: I:\2016\4\08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_1990s.mxd PRINTED ON: 2018-03-20 AT: 2:59:04 PM

693500
694000
694500
695000
5656500
5656000
5655500
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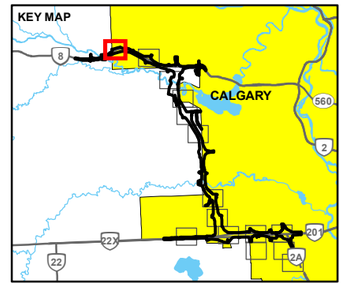
W01
W02
W03

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-98

PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_2000s.mxd PRINTED ON: 2018-03-20 AT: 2:55:16 PM

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

25mm

0

696000 696500 697000 697500

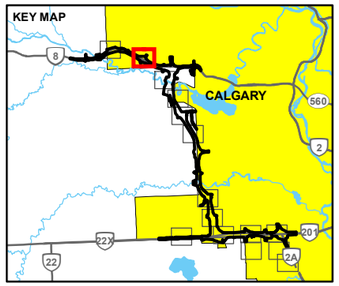
5685500

5685000

W04

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.
PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSULTANTS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-99

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

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698000
698500
699000
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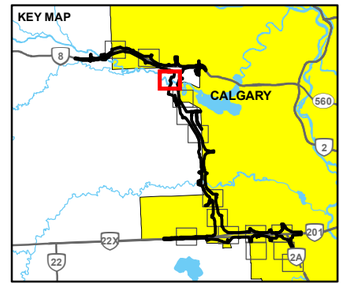
5663500
5663000
W05

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2005 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-100

PATH: I:\2016\4.08\638\Mapping\MXD\Vegetation\WAR_2018_Report1789100_HistoricalAirphotos_2000s.mxd PRINTED ON: 2018-03-20 AT: 2:56:54 PM

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

25mm

0

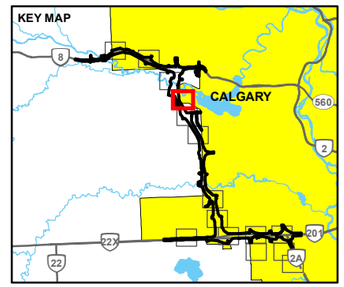
699000
699500
700000
5652500
5652000

W06
WC01
W07 &
W08

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2005 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-101

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

25mm

0

PATH: I:\2014\4.08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_2005s.mxd PRINTED ON: 2018-03-20 AT: 2:57:30 PM

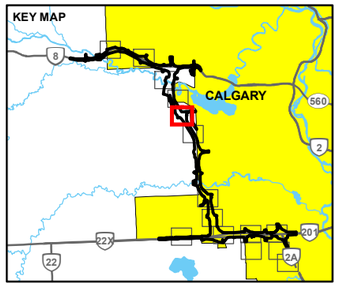
699000
699500
700000
5651500
5651000
5650500

WC01
W09
W10

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE

KEY MAP



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1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-102

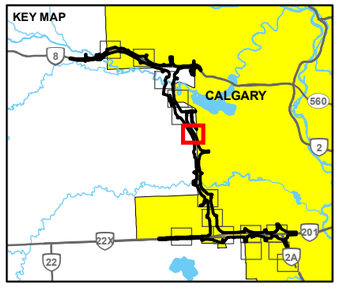
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: I:\2014\4.08\63\Mapping\MXD\Vegetation\WAIR_2018_Report1789100_HistoricalAirphotos_2000s.mxd PRINTED ON: 2018-03-20 AT: 2:58:57 PM

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2005 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-103

PATH: I:\2014\1408635\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_2005a.mxd PRINTED ON: 2018-03-20 AT: 3:01:18 PM

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

0 25mm

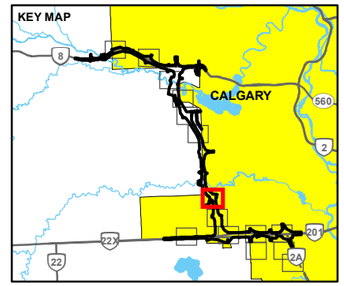
701000
701500
702000
5645000
5644500

W13
W14

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



0 100 200

1:5,000 METRES

REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-104

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

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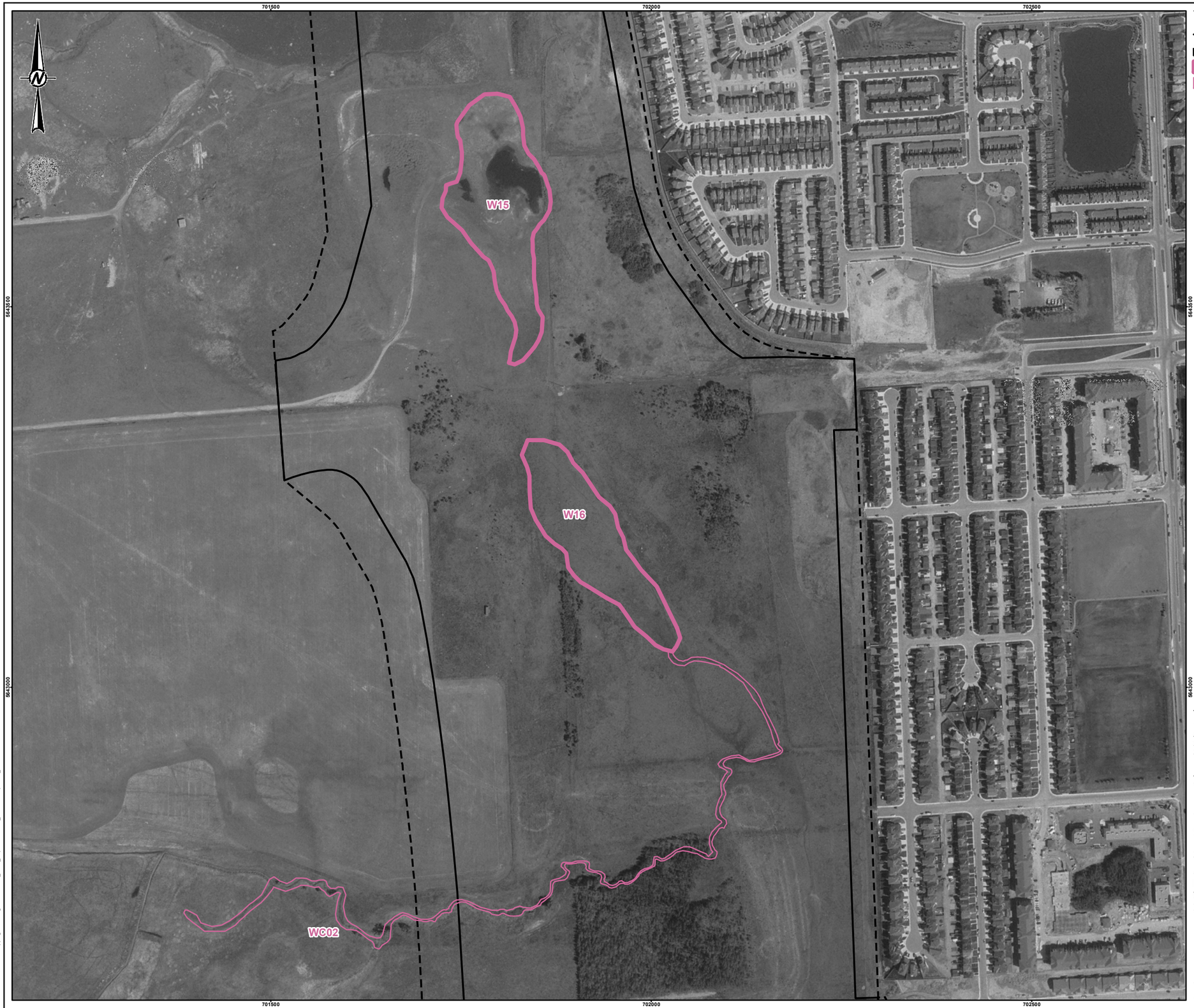
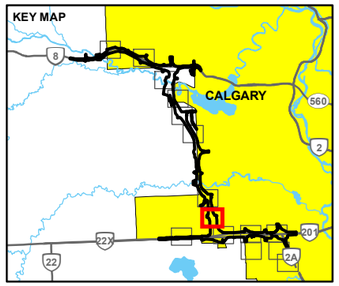


LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND
- WATERCOURSE



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-105

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

25mm

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699000
699500
700000
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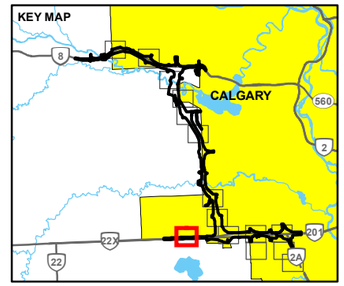
5641500

W18
W17

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-106

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

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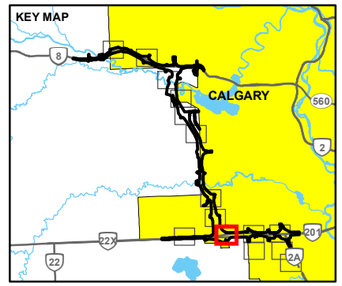
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
2. ALBERTA DIGITAL BASE DATA OBTAINED FROM ALTALIS LTD. © GOVERNMENT OF ALBERTA 2014. ALL RIGHTS RESERVED, CANVEC, GEOBASE, IHS ENERGY INC.

PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-107

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

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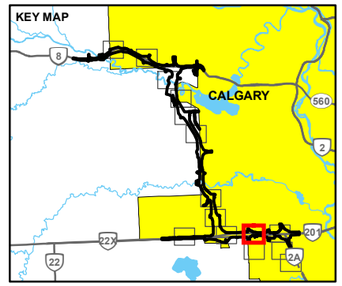
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-108

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

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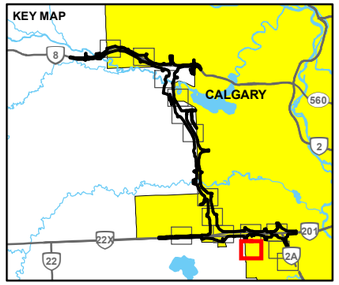
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-109

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25mm

0

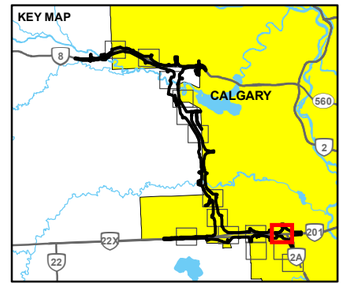
706500
707000
707500
6642500
6642000
6641500

W26
W27
W28
W29
W30
W31
W32

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND

KEY MAP



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1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-110

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

25mm

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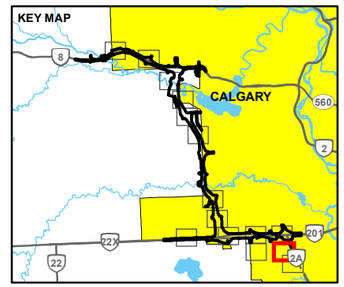
PATH: I:\2014\4-08\63\Mapping\MXD\Vegetation\WAR_2018_Report\1789100_HistoricalAirphotos_2000s.mxd PRINTED ON: 2018-03-20 AT: 3:05:19 PM

706500
707000
707500
5641000
5640500

W31
W31

LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-111

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

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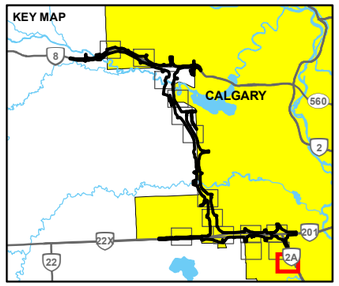
LEGEND

- RIGHT OF WAY BOUNDARY
- TRANSPORTATION UTILITY CORRIDOR
- WETLAND



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REFERENCE(S)

1. AIR PHOTOS OBTAINED FROM THE UNIVERSITY OF CALGARY, THE GOVERNMENT OF ALBERTA AND THE NATIONAL AIRPHOTO LIBRARY.
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PROJECTION: UTM ZONE 11 DATUM: NAD 83

CLIENT KGL CONSTRUCTORS

PROJECT
SOUTHWEST CALGARY RING ROAD

TITLE
2008 HISTORICAL AERIAL PHOTOGRAPH INCLUDING DELINEATION OF NATURAL WETLANDS AND ISOLATED WATERCOURSES WITHIN THE PROJECT AREA

CONSULTANT GOLDER

YYYY-MM-DD	2018-03-20
DESIGNED	AO
PREPARED	AA
REVIEWED	JT
APPROVED	MJ

PROJECT NO. 1789100 REV. 0 FIGURE A-112

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

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PATH: I:\2014\4\08\63\Mapping\MXD\Vegetation\WAIR_2018_Report\1789100_HistoricalAirphotos_2008s.mxd PRINTED ON: 2018-03-20 AT: 3:06:50 PM

APPENDIX C

Project Site Photos

Photo 1: North view of W01 M-G-II 51.021753°N, 114.231493°W (surveyed October 20, 2016 by Golder).

Photo 2: East view of W01 M-G-II 51.021753°N, 114.231493°W (surveyed October 20, 2016 by Golder).

Photo 3: South view of W01 M-G-II 51.021753°N, 114.231493°W (surveyed October 20, 2016 by Golder).

Photo 4: West view of W01 M-G-II 51.021753°N, 114.231493°W (surveyed October 20, 2016 by Golder).

Photo 5: Close-up view of soil core of W01 M-G-II 51.021753°N, 114.231493°W (surveyed October 20, 2016 by Golder).

Photo 6: North view W04 S-Wd-III 51.015695°N, 114.194515°W (surveyed as Wetland Reference Number 1 on June 11, 2016 by CH2M).

Photo 7: East view W04 S-Wd-III 51.015695°N, 114.194515°W (surveyed as Wetland Reference Number 1 on June 11, 2016 by CH2M).

Photo 8: South view W04 S-Wd-III 51.015695°N, 114.194515°W (surveyed as Wetland Reference Number 1 on June 11, 2016 by CH2M).

Photo 9: West view of W04 S-Wd-III 51.015695°N, 114.194515°W (surveyed as Wetland Reference Number 1 on June 11, 2016 by CH2M).

Photo 10: North view of W06 W-A-IV 50.987021°N, 114.160671°W (surveyed October 19, 2016 by Golder).

Photo 11: East view W06 W-A-IV 50.987021°N, 114.160671°W (surveyed October 19, 2016 by Golder).

Photo 12: South view of W06 W-A-IV 50.987021°N, 114.160671°W (surveyed October 19, 2016 by Golder).

Photo 13: West view of W06 W-A-IV 50.987021°N, 114.160671°W (surveyed October 19, 2016 by Golder).

Photo 14: Close-up view of soil core from W06 W-A-IV 50.987021°N, 114.160671°W (surveyed October 19, 2016 by Golder).

Photo 15: North view of W07 S-S-III 50.984729°N, 114.163460°W (surveyed October 19, 2016 by Golder).

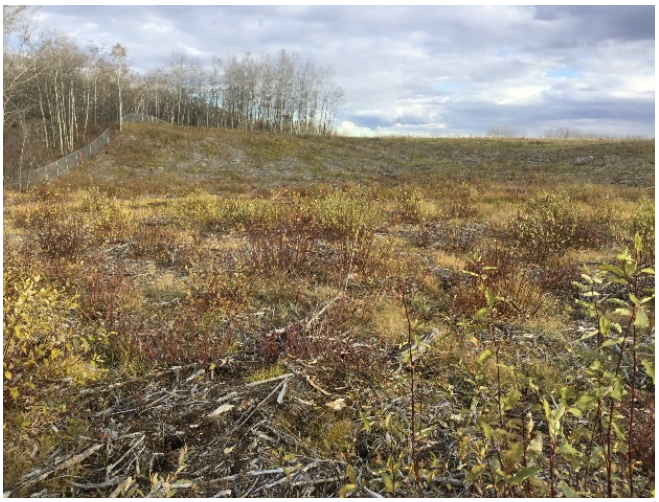

Photo 16: East view of W07 S-S-III 50.984729°N, 114.163460°W (surveyed October 19, 2016 by Golder).

Photo 17: South view of W07 S-S-III 50.984729°N, 114.163460°W (surveyed October 19, 2016 by Golder).

Photo 18: West view of W07 S-S-III 50.984729°N, 114.163460°W (surveyed October 19, 2016 by Golder).

Photo 19: Close-up view of soil core W07 S-S-III 50.984729°N, 114.163460°W (surveyed October 19, 2016 by Golder).

Photo 20: Northeast view of W08 M-G-III 50.984729°N, 114.163460°W (surveyed as Wetland Reference Number 4 on June 13, 2016 by CH2M).

Photo 21: East view of W08 M-G-III 50.984729°N, 114.163460°W (surveyed as Wetland Reference Number 4 on June 13, 2016 by CH2M).

Photo 22: Southwest view of W08 M-G-III 50.984729°N, 114.163460°W (surveyed as Wetland Reference Number 4 on June 13, 2016 by CH2M).

Photo 23: West view of W08 M-G-III 50.984729°N, 114.163460°W (surveyed as Wetland Reference Number 4 on June 13, 2016 by CH2M).

Photo 24: View of ground of W08 M-G-III 50.984729°N, 114.163460°W (surveyed as Wetland Reference Number 4 on June 13, 2016 by CH2M).).

Photo 25: North view of W09 M-G-III 50.975294°N, 114.160295°W (surveyed October 20, 2016 by Golder).

Photo 26: East view of W09 M-G-III 50.975294°N, 114.160295°W (surveyed October 20, 2016 by Golder).

Photo 27: South view of W09 M-G-III 50.975294°N, 114.160295°W (surveyed October 20, 2016 by Golder).

Photo 28: West view of W09 M-G-III 50.975294°N, 114.160295°W (surveyed October 20, 2016 by Golder).

Photo 29: Close-up view of soil core from W09 M-G-III 50.975294°N, 114.160295°W (surveyed October 20, 2016 by Golder).

Photo 30: North view of W10 M-G-III 50.970124°N, 114.149818°W (surveyed October 21, 2016 by Golder).

Photo 31: East view of W10 M-G-III 50.970124°N, 114.149818°W (surveyed October 21, 2016 by Golder).

Photo 32: South view of W10 M-G-III 50.970124°N, 114.149818°W (surveyed October 21, 2016 by Golder).

Photo 33: West view of W10 M-G-III 50.970124°N, 114.149818°W (surveyed October 21, 2016 by Golder).

Photo 34: Close-up view of soil core from W10 M-G-III 50.970124°N, 114.149818°W (surveyed October 21, 2016 by Golder).

Photo 35: Northeast view of W11 W-A-V 50.905125°N, 114.128179°W (surveyed as Wetland Reference Number 5 on June 12, 2016 by CH2M).

Photo 36: East view of W11 W-A-V 50.905125°N, 114.128179°W (surveyed as Wetland Reference Number 5 on June 12, 2016 by CH2M).

Photo 37: South view of W11 W-A-V 50.905125°N, 114.128179°W (surveyed as Wetland Reference Number 5 on June 12, 2016 by CH2M).

Photo 38: Southeast view of W11 W-A-V 50.905125°N, 114.128179°W (surveyed as Wetland Reference Number 5 on June 12, 2016 by CH2M).

Photo 39: View of ground of W11 W-A-V 50.905125°N, 114.128179°W (surveyed as Wetland Reference Number 5 on June 12, 2016 by CH2M).

Photo 40: North view of W12 M-G-III 50.957327°N, 114.141369°W (surveyed as Wetland Reference Number 6 on June 12, 2016 by CH2M).

Photo 41: East view of W12 M-G-III 50.957327°N, 114.141369°W (surveyed as Wetland Reference Number 6 on June 12, 2016 by CH2M).

Photo 42: South view of W12 M-G-III 50.957327°N, 114.141369°W (surveyed as Wetland Reference Number 6 on June 12, 2016 by CH2M).

Photo 43: Southwest view of W12 M-G-III 50.957327°N, 114.141369°W (surveyed as Wetland Reference Number 6 on June 12, 2016 by CH2M).

Photo 44: North view of W12 M-G-III 50.957327°N, 114.141369°W (surveyed as Wetland Reference Number 6 on June 12, 2016 by CH2M).

Photo 45: East view of W13 M-G-III W13, 50.920917°N, 114.133108°W (surveyed October 17, 2016 by Golder).

Photo 46: South view of W13 M-G-III W13, 50.920917°N, 114.133108°W (surveyed October 17, 2016 by Golder).

Photo 47: West view of W13 M-G-III W13, 50.920917°N, 114.133108°W (surveyed October 17, 2016 by Golder).

Photo 48: Close-up view of soil core W13 M-G-III 50.920917°N, 114.133108°W (surveyed October 17, 2016 by Golder).

Photo 49: North view of W14 M-G-II 50.919621°N, 114.131492°W (surveyed October 17, 2016 by Golder).

Photo 50: East view of W14 M-G-II 50.919621°N, 114.131492°W (surveyed October 17, 2016 by Golder).

Photo 51: South view of W14 M-G-II 50.919621°N, 114.131492°W (surveyed October 17, 2016 by Golder).

Photo 52: Close-up view of soil core of W14 M-G-II 50.919621°N, 114.131492°W (surveyed October 17, 2016 by Golder).

Photo 53: North view of W15 W-A-IV 50.891503°N, 114.115211°W (surveyed October 18, 2016 by Golder).

Photo 54 East view of W15 W-A-IV 50.891503°N, 114.115211°W (surveyed October 18, 2016 by Golder).

Photo 55. South view of W15 W-A-IV 50.891503°N, 114.115211°W (surveyed October 18, 2016 by Golder).

Photo 56. West view of W15 W-A-IV 50.891503°N, 114.115211°W (surveyed October 18, 2016 by Golder).

Photo 57. Close-up view of ground W15 W-A-IV 50.891503°N, 114.115211°W (surveyed October 18, 2016 by Golder).

Photo 58: North view of W16 M-G-II 50.905125°N, 114.128179°W (surveyed October 17, 2016 by Golder).

Photo 59: East view of W16 M-G-II 50.905125°N, 114.128179°W (surveyed October 17, 2016 by Golder).

Photo 60: South view of W16 M-G-II 50.905125°N, 114.128179°W (surveyed October 17, 2016 by Golder).

Photo 61: West view of W16 M-G-II 50.905125°N, 114.128179°W (surveyed October 17, 2016 by Golder).

Photo 62: Close-up view of soil core W16 M-G-II 50.905125°N, 114.128179°W (surveyed October 17, 2016 by Golder).

Photo 63: East view of W19 M-G-II 50.896201°N, 114.120945°W (surveyed October 19, 2016 by Golder).

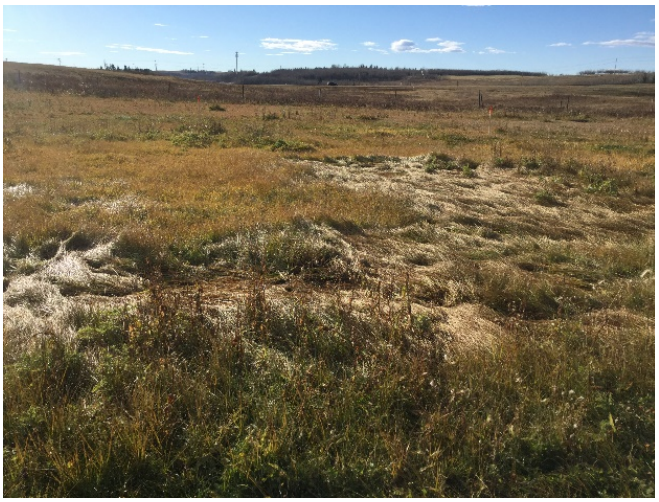

Photo 64: South view W19 M-G-II 50.896201°N, 114.120945°W (surveyed October 19, 2016 by Golder).

Photo 65: Close-up view of soil core W19 M-G-II 50.896201°N, 114.120945°W (surveyed October 19, 2016 by Golder).

Photo 66: North view of W20 M-G-II 50.893191°N, 114.116699°W (surveyed as Wetland Reference Number 7 on June 17, 2016 by CH2M).

Photo 67: Northeast view of W20 M-G-II 50.893191°N, 114.116699°W (surveyed as Wetland Reference Number 7 on June 17, 2016 by CH2M).

Photo 68: South view of W20 M-G-II 50.893191°N, 114.116699°W (surveyed as Wetland Reference Number 7 on June 17, 2016 by CH2M).

Photo 69: Northwest view of W20 M-G-II 50.893191°N, 114.116699°W (surveyed as Wetland Reference Number 7 on June 17, 2016 by CH2M).

Photo 70: North view of W20 M-G-II 50.893191°N, 114.116699°W (surveyed as Wetland Reference Number 7 on June 17, 2016 by CH2M).

Photo 71: East view of W21 M-G-II 50.891503°N, 114.115211°W (surveyed as Wetland Reference Number 8 on June 17, 2016 by CH2M).

Photo 72: South view of W21 M-G-II 50.891503°N, 114.115211°W (surveyed as Wetland Reference Number 8 on June 17, 2016 by CH2M).

Photo 73: Northeast view of W21 M-G-II 50.891503°N, 114.115211°W (surveyed as Wetland Reference Number 8 on June 17, 2016 by CH2M).

Photo 74: North view of W22 W-A-V 50.893202°N, 114.093372°W (surveyed as Wetland Reference Number 9 on June 13, 2016 by CH2M).

Photo 75: East view of W22 W-A-V 50.893202°N, 114.093372°W (surveyed as Wetland Reference Number 9 on June 13, 2016 by CH2M).

Photo 76: South view of W22 W-A-V 50.893202°N, 114.093372°W (surveyed as Wetland Reference Number 9 on June 13, 2016 by CH2M).

Photo 77: Close-up view of ground of W22 W-A-V 50.893202°N, 114.093372°W (surveyed as Wetland Reference Number 9 on June 13, 2016 by CH2M).

Photo 78: North view of W24 M-G-III 50.89287°N, 114.082711°W (surveyed October 19, 2016 by Golder).

Photo 79: East view of W24 M-G-III 50.89287°N, 114.082711°W (surveyed October 19, 2016 by Golder).

Photo 80: South view of W24 M-G-III 50.89287°N, 114.082711°W (surveyed October 19, 2016 by Golder).

Photo 81: West view of W24 M-G-III 50.89287°N, 114.082711°W (surveyed October 19, 2016 by Golder).

Photo 82: Close-up view of soil core W24 M-G-III 50.89287°N, 114.082711°W (surveyed October 19, 2016 by Golder).

Photo 83: North view of W26 W-A-V 50.894241°N, 114.066948°W (surveyed as Wetland Reference Number 12 on June 10, 2016 by CH2M).

Photo 84: East view of W26 W-A-V 50.894241°N, 114.066948°W (surveyed as Wetland Reference Number 12 on June 10, 2016 by CH2M).

Photo 85: West view of W26 W-A-V 50.894241°N, 114.066948°W (surveyed as Wetland Reference Number 12 on June 10, 2016 by CH2M).

Photo 86: North view W27 W-A-V 50.894375°N, 114.064862°W (surveyed as Wetland Reference Number 11 on June 10, 2016 by CH2M).

Photo 87: Northwest view W27 W-A-V 50.894375°N, 114.064862°W (surveyed as Wetland Reference Number 11 on June 10, 2016 by CH2M).

Photo 88: South view W27 W-A-V 50.894375°N, 114.064862°W (surveyed as Wetland Reference Number 11 on June 10, 2016 by CH2M).

Photo 89: West view of W27 W-A-V 50.894375°N, 114.064862°W (surveyed as Wetland Reference Number 11 on June 10, 2016 by CH2M).

Photo 90: Northwest view of W30 S-Wd-III 50.889925°N, 114.063974°W (surveyed as Wetland Reference Number 15 on June 10, 2016 by CH2M).

Photo 91: East view of W30 S-Wd-III 50.889925°N, 114.063974°W (surveyed as Wetland Reference Number 15 on June 10, 2016 by CH2M).

Photo 92: South view of W30 S-Wd-III 50.889925°N, 114.063974°W (surveyed as Wetland Reference Number 15 on June 10, 2016 by CH2M).

Photo 93: West view of W30 S-Wd-III 50.889925°N, 114.063974°W (surveyed as Wetland Reference Number 15 on June 10, 2016 by CH2M).

Photo 94: Northeast view of W31 W-A-V 50.879528°N, 114.053503°W (surveyed as Wetland Reference Number 14 on June 10, 2016 by CH2M).

Photo 95: East view of W31 W-A-V 50.879528°N, 114.053503°W (surveyed as Wetland Reference Number 14 on June 10, 2016 by CH2M).

Photo 96: Southwest view of W31 W-A-V 50.879528°N, 114.053503°W (surveyed as Wetland Reference Number 14 on June 10, 2016 by CH2M).

Photo 97: West view of W31 W-A-V 50.879528°N, 114.053503°W (surveyed as Wetland Reference Number 14 on June 10, 2016 by CH2M).

Photo 98: North view W32 M-G-III 50.888798°N, 114.050621°W (surveyed as Wetland Reference Number 17 on June 6, 2016 by CH2M).

Photo 99: East view of W32 M-G-III 50.888798°N, 114.050621°W (surveyed as Wetland Reference Number 17 on June 6, 2016 by CH2M).

Photo 100: South view of W32 M-G-III 50.888798°N, 114.050621°W (surveyed as Wetland Reference Number 17 on June 6, 2016 by CH2M).

Photo 101: West view of W32 M-G-III 50.888798°N, 114.050621°W (surveyed as Wetland Reference Number 17 on June 6, 2016 by CH2M).

Photo 102: Overview of intermittent watercourse WC01 (surveyed October 20, 2016 by Golder).

Photo 103: View of watercourse WC02 in wooded area (surveyed October 18, 2016 by Golder).

Note: photographs at W04 (close-up view of soil core or the ground), W12 (close-up view of soil core or the ground), W14 (west), W19 (north), W19 (west), W20 (close-up view of soil core or the ground), W21 (close-up view of soil core or the ground), W22 and W23 (west), W26 (south), W26 (close-up view of soil core or the ground), W27 (east), W27 (close-up view of soil core or the ground), W30 (close-up view of soil core or the ground), W31 (close-up view of soil core or the ground), W32 (close-up view of soil core or the ground) were not captured in the field and not included in the photo appendix.

APPENDIX D

ACIMS Ranking Definitions

Table D-1 Alberta Conservation Information Management System (ACIMS) Rare Plant Ranking Definitions

Rank	Definition
SX	Taxon is believed to be extirpated from the province.
	Not located despite intensive searches of historical sites and other appropriate habitat.
	Virtually no likelihood that it will be rediscovered.
SH	Known from only historical records but still some hope of rediscovery.
	Evidence that the taxon may no longer be present but not enough to state this with certainty.
S1	Known from five or fewer occurrences or especially vulnerable to extirpation because of other factor(s).
S2	Known from twenty or fewer occurrences or vulnerable to extirpation because of other factors.
S3	Known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes, or other factors.
S4	Apparently secure.
	Taxon is uncommon but not rare.
	Potentially some cause for long term concern due to declines or other factors.
S5	Secure - taxon is common, widespread, and abundant.
Variant Subnational Conservation Status Ranks	
S#S#	A numeric range rank is used to indicate any range of uncertainty about the status of the taxon. Example - S2S3 or S1S3.
	Ranges cannot skip more than two ranks. Example - SU is used rather than S1S4.
SU	Taxon is currently unrankable due to lack of information or substantially conflicting information. Example - native versus non-native status not resolved.
SNR	Not ranked.
	Conservation status not yet assessed.
SNA	Not applicable.
	A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities. Example - introduced species.
Subnational Conservation Status Rank Qualifiers	
Qualifier	**Definition**
S#?	Inexact numeric rank.
	Applied when a specific rank is most likely appropriate but for which some conflicting information or unresolved questions remain. Example - S2? believed to be 6 to 20 occurrences but some uncertainty.

Table D-1 Alberta Conservation Information Management System (ACIMS) Rare Plant Ranking Definitions

Rank	Definition
Global Rank Definitions	
GX	**Presumed Extinct** (species)/**Eliminated** (ecological communities and systems) — Species not located despite intensive searches and virtually no likelihood of rediscovery. Ecological community or system eliminated throughout its range, with no restoration potential.
GH	**Possibly Extinct** (species)/**Eliminated** (ecological communities and systems) — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct or the ecosystem may be eliminated throughout its range, but not enough to state this with certainty.
G1	**Critically Imperiled** — At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.
G2	**Imperiled** — At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
G3	**Vulnerable** — At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4	**Apparently Secure** — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	**Secure** — Common; widespread and abundant.

Source: ACIMS 2015.

APPENDIX E

ACIMS and FWMIS Search Results

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 26 **TWP:** 022 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 04 **TWP:** 024 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 1 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
5-02-024-04	5363	NLT0010860	S2S3	Flavopunctelia soredica	powder-edged speckled greenshield lichen	2-Aug-66

Next Steps: See FAQ

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 09 **TWP:** 024 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 1 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
5-02-024-09	5363	NLT0010860	S2S3	Flavopunctelia soredica	powder-edged speckled greenshield lichen	2-Aug-66

Next Steps: See FAQ

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 24 **TWP:** 023 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 30 **TWP:** 022 **RGE:** 01 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 25 **TWP:** 023 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 31 **TWP:** 022 **RGE:** 01 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 30 **TWP:** 022 **RGE:** 01 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 25 **TWP:** 023 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 25 **TWP:** 022 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 24 **TWP:** 023 **RGE:** 02 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 30 **TWP:** 022 **RGE:** 01 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 30 **TWP:** 022 **RGE:** 01 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Search ACIMS Data

Date: 27/10/2016
Requestor: Consultant
Reason for Request: General Status
SEC: 28 **TWP:** 022 **RGE:** 01 **MER:** 5

Alberta Parks

Non-sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Non-sensitive EOs Found: Next Steps - See FAQ						

Sensitive EOs: 0 (*Data Updated:July 2015*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:May 2015*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

.

Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:27

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
No Species Found in Search Extent	AMERICAN KESTREL GREAT BLUE HERON	No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
558394, 5636010	10-TM AEP Forest	SE 26 22 2 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:27

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:49

Species present within the current extent :

Fish Inventory

- ARCTIC CHAR
- BROOK STICKLEBACK
- BROOK TROUT
- BROWN TROUT
- BULL TROUT
- BURBOT
- LONGNOSE DACE
- LONGNOSE SUCKER
- MOUNTAIN WHITEFISH
- RAINBOW TROUT
- WHITE SUCKER

Wildlife Inventory

- BOBCAT
- CLARK'S NUTCRACKER
- GREAT BLUE HERON
- PILEATED WOODPECKER
- SORA

Stocked Inventory

- BROWN TROUT
- CUTTHROAT TROUT
- RAINBOW TROUT

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
553875, 5650251	10-TM AEP Forest	NW 4 24 2 5	3 kilometers

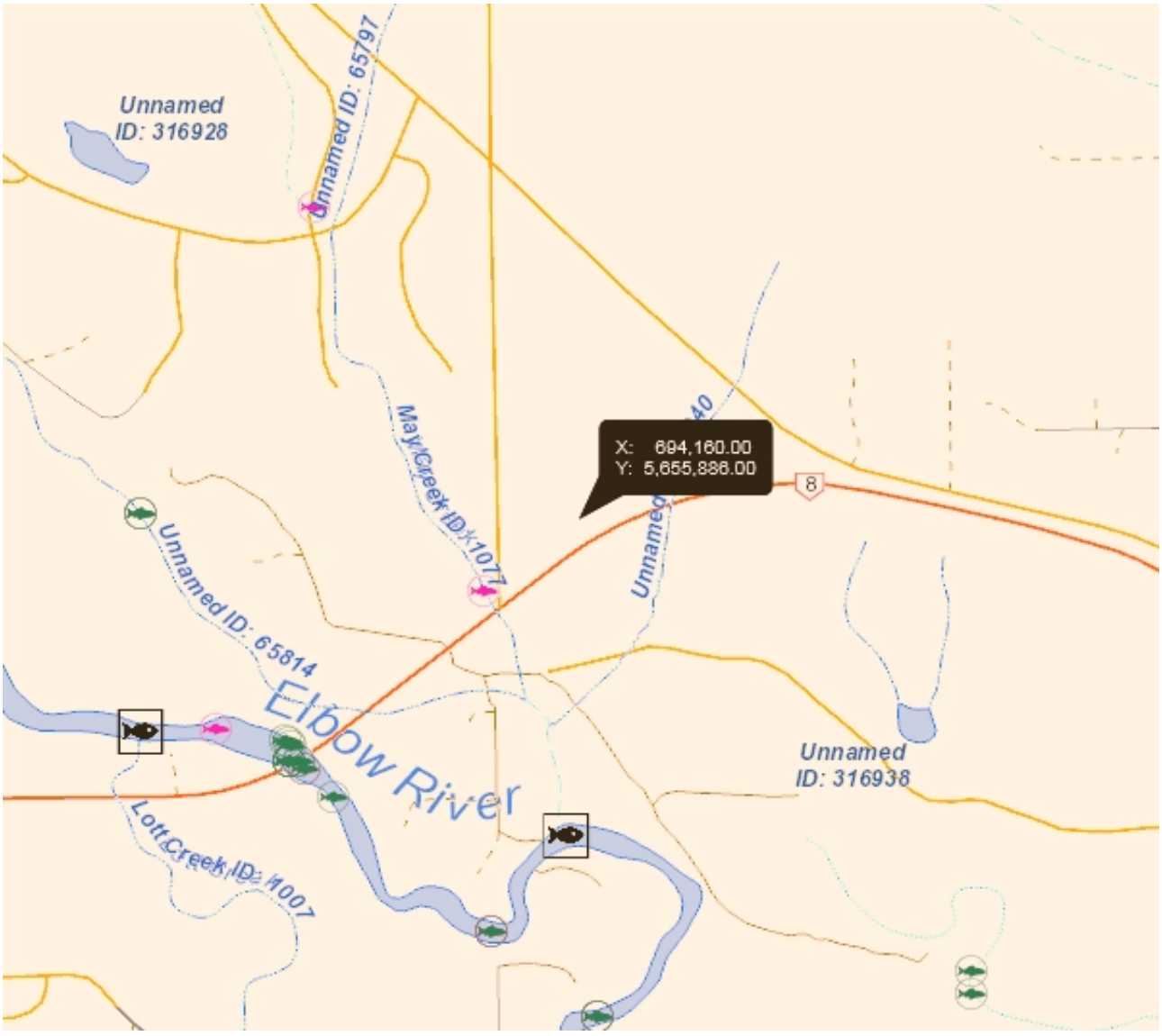
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:49

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:55

Species present within the current extent :

Fish Inventory

- ARCTIC CHAR
- BROOK STICKLEBACK
- BROOK TROUT
- BROWN TROUT
- BULL TROUT
- BURBOT
- LONGNOSE DACE
- LONGNOSE SUCKER
- MOUNTAIN WHITEFISH
- RAINBOW TROUT
- WHITE SUCKER

Wildlife Inventory

- BOBCAT
- CLARK'S NUTCRACKER
- GREAT BLUE HERON
- NORTHERN LEOPARD FROG
- PILEATED WOODPECKER
- SORA

Stocked Inventory

- BROWN TROUT
- CUTTHROAT TROUT
- RAINBOW TROUT

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
553957, 5650471	10-TM AEP Forest	SW 9 24 2 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:55

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:51

Species present within the current extent :

Fish Inventory

- ARCTIC CHAR
- BROOK STICKLEBACK
- BROOK TROUT
- BROWN TROUT
- BULL TROUT
- BURBOT
- LONGNOSE DACE
- LONGNOSE SUCKER
- MOUNTAIN WHITEFISH
- RAINBOW TROUT
- WHITE SUCKER

Wildlife Inventory

- BOBCAT
- CLARK'S NUTCRACKER
- GREAT BLUE HERON
- NORTHERN LEOPARD FROG
- PILEATED WOODPECKER
- SORA

Stocked Inventory

- BROWN TROUT
- CUTTHROAT TROUT
- RAINBOW TROUT

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
554057, 5650486	10-TM AEP Forest	SW 9 24 2 5	3 kilometers

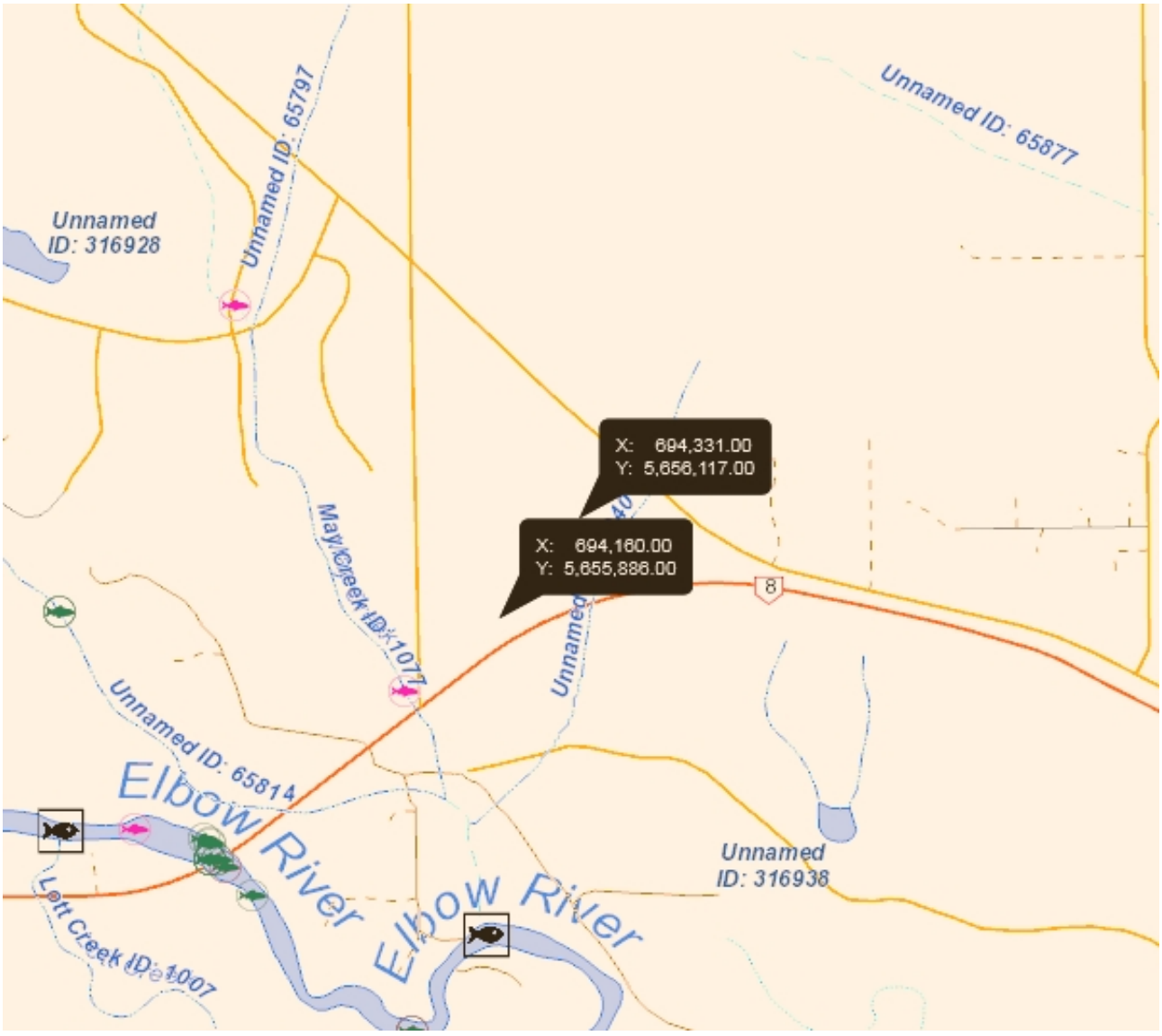
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:51

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:47

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROWN TROUT	BALD EAGLE	KOKANEE
BURBOT	BALTIMORE ORIOLE	LAKE TROUT
CUTTHROAT TROUT	BOBCAT	RAINBOW TROUT
LONGNOSE SUCKER	COMMON YELLOWTHROAT	
MOUNTAIN WHITEFISH	COUGAR	
NORTHERN PIKE	EASTERN PHOEBE	
RAINBOW TROUT	GREAT BLUE HERON	
WHITE SUCKER	LEAST FLYCATCHER	
	OLIVE-SIDED FLYCATCHER	
	PIED-BILLED GREBE	
	PILEATED WOODPECKER	
	RED BAT	
	RED-SIDED GARTER SNAKE	
	SORA	
	WANDERING GARTER SNAKE	
	WESTERN TANAGER	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
558998, 5645158	10-TM AEP Forest	NW 24 23 2 5	3 kilometers

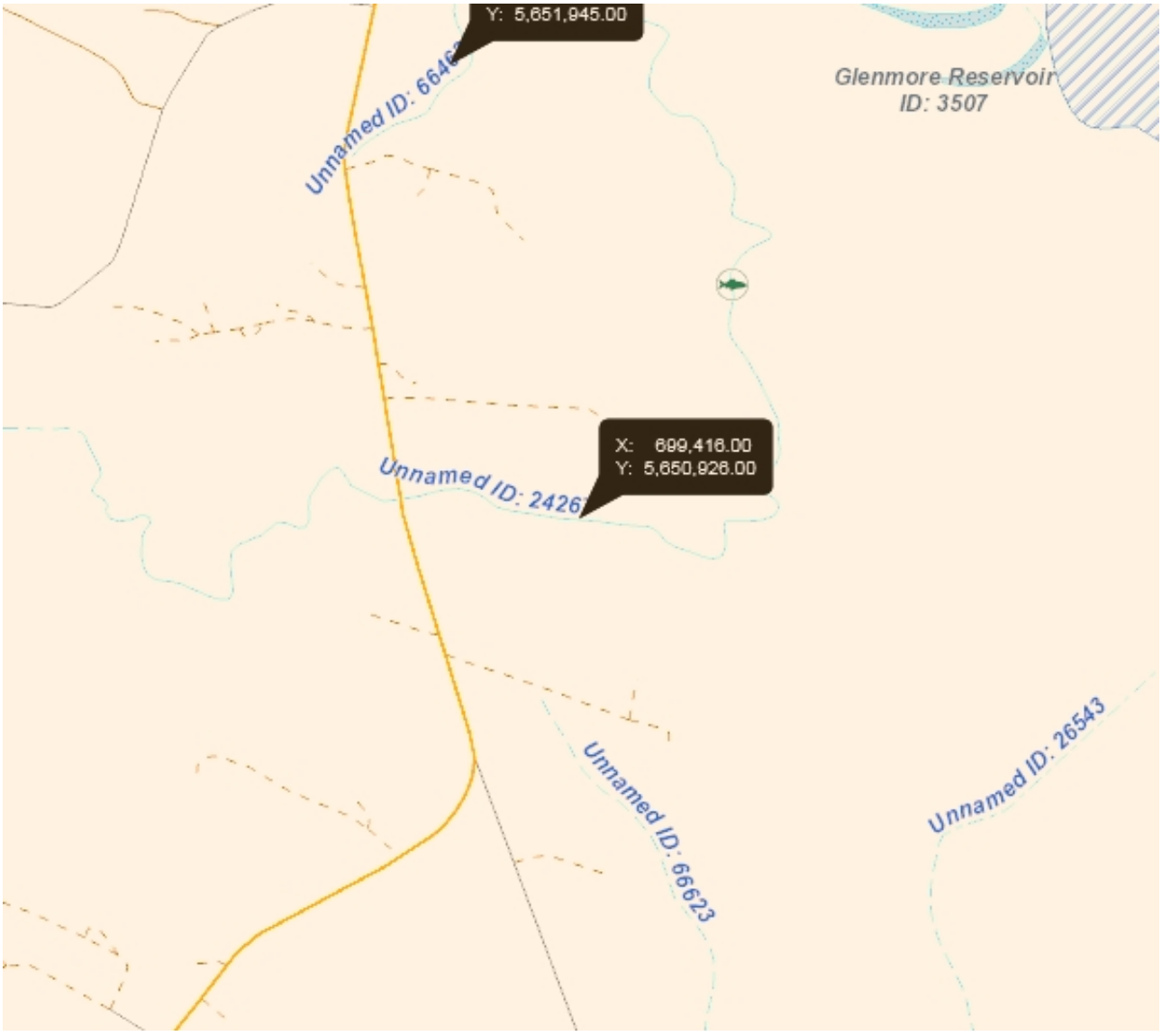
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:47

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:08

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
LAKE CHUB	BOBCAT	
LONGNOSE DACE	COUGAR	
LONGNOSE SUCKER	GREAT BLUE HERON	
MOUNTAIN WHITEFISH	LEAST FLYCATCHER	
PEARL DACE	LONG-TAILED WEASEL	
RAINBOW TROUT	PEREGRINE FALCON	
TROUT-PERCH	PRAIRIE FALCON	
WHITE SUCKER	SILVER-HAIRED BAT	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561020, 5638993	10-TM AEP Forest	NW 31 22 1 5	3 kilometers

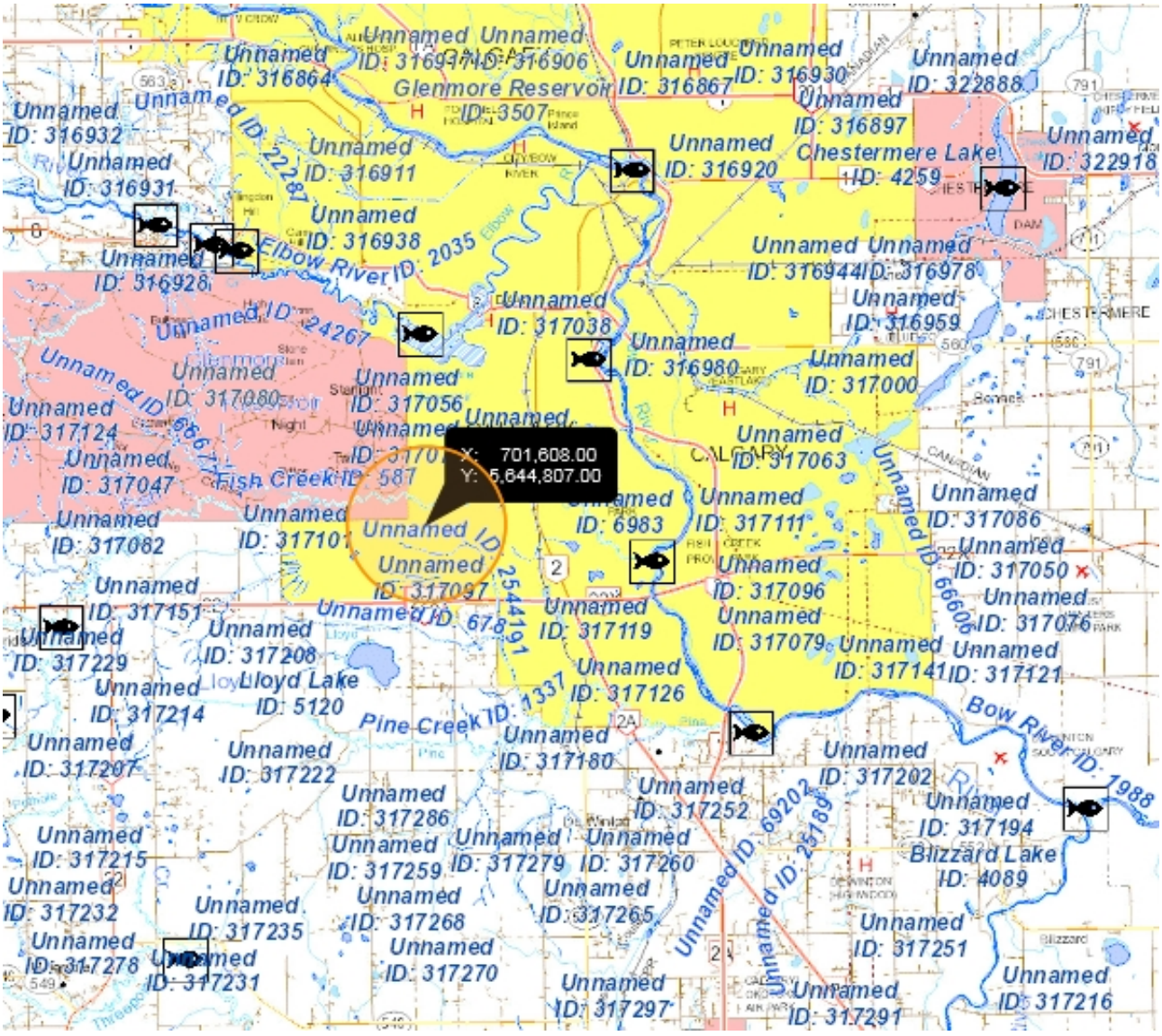
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:08

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:16

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
FATHEAD MINNOW	BOBCAT	
LAKE CHUB	COUGAR	
LONGNOSE DACE	GREAT BLUE HERON	
LONGNOSE SUCKER	LONG-TAILED WEASEL	
PEARL DACE	SORA	
RAINBOW TROUT		
TROUT-PERCH		
WHITE SUCKER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561270, 5637362	10-TM AEP Forest	NE 30 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:16

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:12

Species present within the current extent :

Fish Inventory

- BROOK STICKLEBACK
- BROWN TROUT
- FATHEAD MINNOW
- LAKE CHUB
- LONGNOSE DACE
- LONGNOSE SUCKER
- MOUNTAIN WHITEFISH
- PEARL DACE
- RAINBOW TROUT
- TROUT-PERCH
- WHITE SUCKER

Wildlife Inventory

- AMERICAN KESTREL
- BARN SWALLOW
- BOBCAT
- COUGAR
- GREAT BLUE HERON
- LEAST FLYCATCHER
- LONG-TAILED WEASEL
- SILVER-HAIRED BAT
- SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561181, 5637841	10-TM AEP Forest	SW 31 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:12

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:43

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROWN TROUT	BALD EAGLE	KOKANEE
BURBOT	BALTIMORE ORIOLE	LAKE TROUT
CUTTHROAT TROUT	BOBCAT	RAINBOW TROUT
LONGNOSE SUCKER	COMMON YELLOWTHROAT	
MOUNTAIN WHITEFISH	COUGAR	
NORTHERN PIKE	EASTERN PHOEBE	
RAINBOW TROUT	GREAT BLUE HERON	
WHITE SUCKER	LEAST FLYCATCHER	
	OLIVE-SIDED FLYCATCHER	
	OSPREY	
	PIED-BILLED GREBE	
	PILEATED WOODPECKER	
	RED-SIDED GARTER SNAKE	
	SORA	
	WANDERING GARTER SNAKE	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
558623, 5646539	10-TM AEP Forest	NW 25 23 2 5	3 kilometers

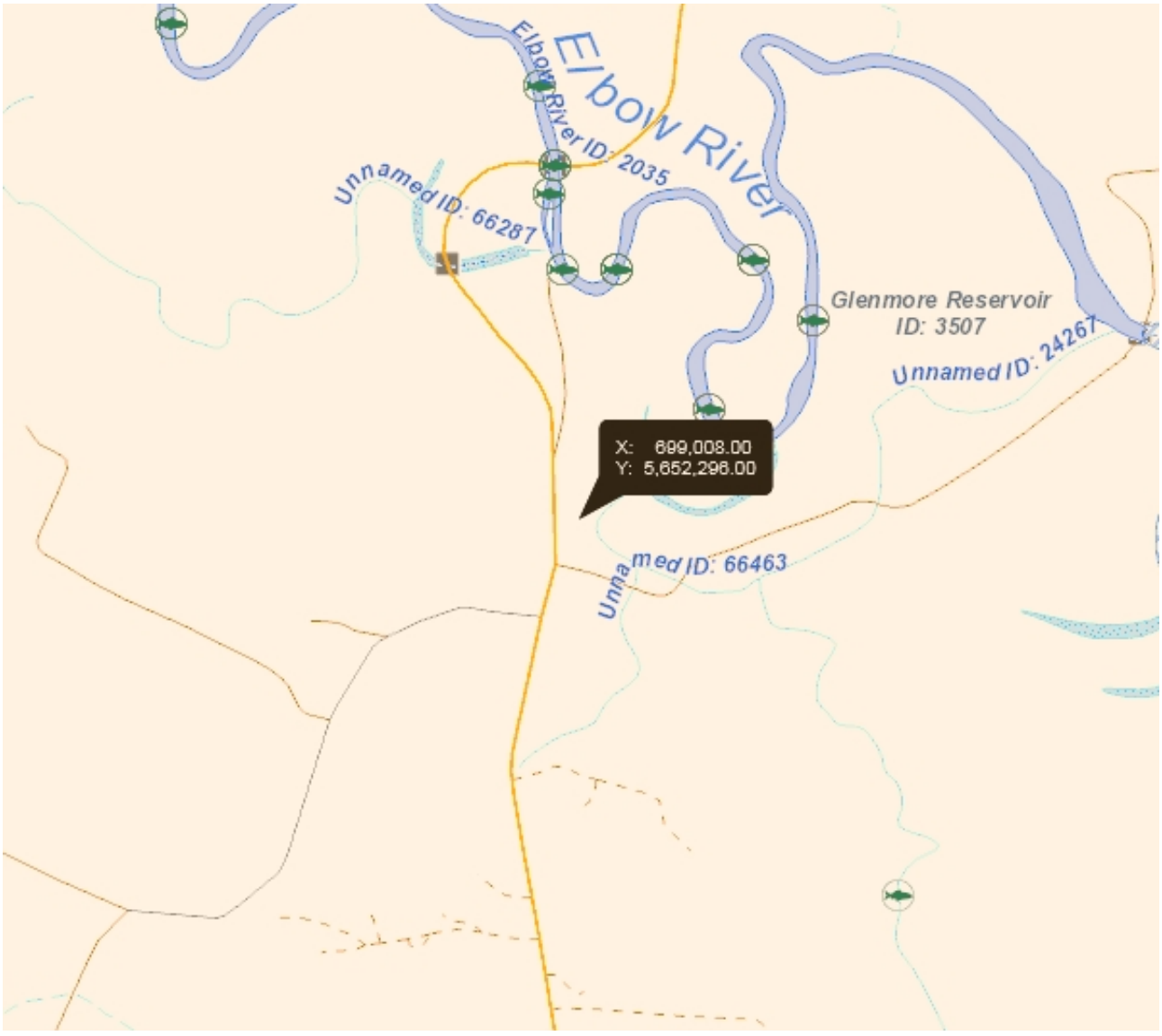
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:43

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:19

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
FATHEAD MINNOW	BOBCAT	
LAKE CHUB	COUGAR	
LONGNOSE DACE	GREAT BLUE HERON	
LONGNOSE SUCKER	LEAST FLYCATCHER	
MOUNTAIN WHITEFISH	LONG-TAILED WEASEL	
PEARL DACE	SILVER-HAIRED BAT	
RAINBOW TROUT	SORA	
TROUT-PERCH		
WHITE SUCKER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561361, 5637725	10-TM AEP Forest	SE 31 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:19

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:33

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
FATHEAD MINNOW	BARN SWALLOW	
	BLACK TERN	
	GREAT BLUE HERON	
	LONG-TAILED WEASEL	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561784, 5636392	10-TM AEP Forest	SE 30 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

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27-Oct-2016 15:33

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:31

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
No Species Found in Search Extent	AMERICAN KESTREL BARN SWALLOW GREAT BLUE HERON LONG-TAILED WEASEL	No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
559445, 5636034	10-TM AEP Forest	SW 25 22 2 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:31

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:45

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROWN TROUT	BALD EAGLE	KOKANEE
BURBOT	BALTIMORE ORIOLE	LAKE TROUT
CUTTHROAT TROUT	BOBCAT	RAINBOW TROUT
LONGNOSE SUCKER	COMMON YELLOWTHROAT	
MOUNTAIN WHITEFISH	COUGAR	
NORTHERN PIKE	EASTERN PHOEBE	
RAINBOW TROUT	GREAT BLUE HERON	
WHITE SUCKER	LEAST FLYCATCHER	
	OLIVE-SIDED FLYCATCHER	
	OSPREY	
	PIED-BILLED GREBE	
	PILEATED WOODPECKER	
	RED-SIDED GARTER SNAKE	
	SORA	
	WANDERING GARTER SNAKE	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
558709, 5646183	10-TM AEP Forest	SW 25 23 2 5	3 kilometers

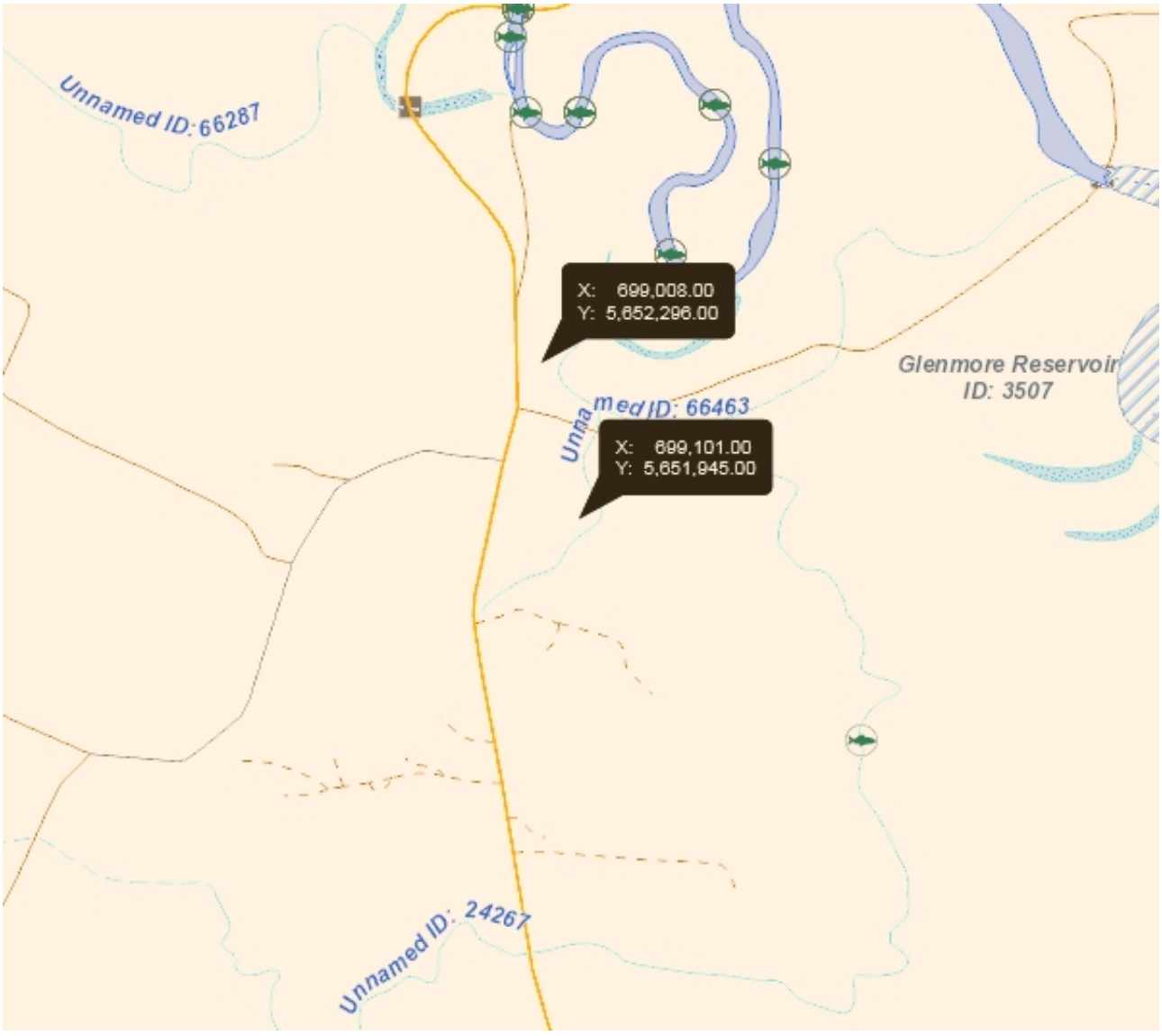
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:45

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:57

Species present within the current extent :

Fish Inventory

- BROWN TROUT
- BURBOT
- CUTTHROAT TROUT
- LONGNOSE SUCKER
- MOUNTAIN WHITEFISH
- NORTHERN PIKE
- WHITE SUCKER

Wildlife Inventory

- BALD EAGLE
- BALTIMORE ORIOLE
- BOBCAT
- COMMON YELLOWTHROAT
- COUGAR
- EASTERN PHOEBE
- GREAT BLUE HERON
- LEAST FLYCATCHER
- OLIVE-SIDED FLYCATCHER
- PIED-BILLED GREBE
- PILEATED WOODPECKER
- RED BAT
- RED-SIDED GARTER SNAKE
- SORA
- WANDERING GARTER SNAKE
- WESTERN TANAGER

Stocked Inventory

- KOKANEE
- LAKE TROUT
- RAINBOW TROUT

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
559672, 5644582	10-TM AEP Forest	SE 24 23 2 5	3 kilometers

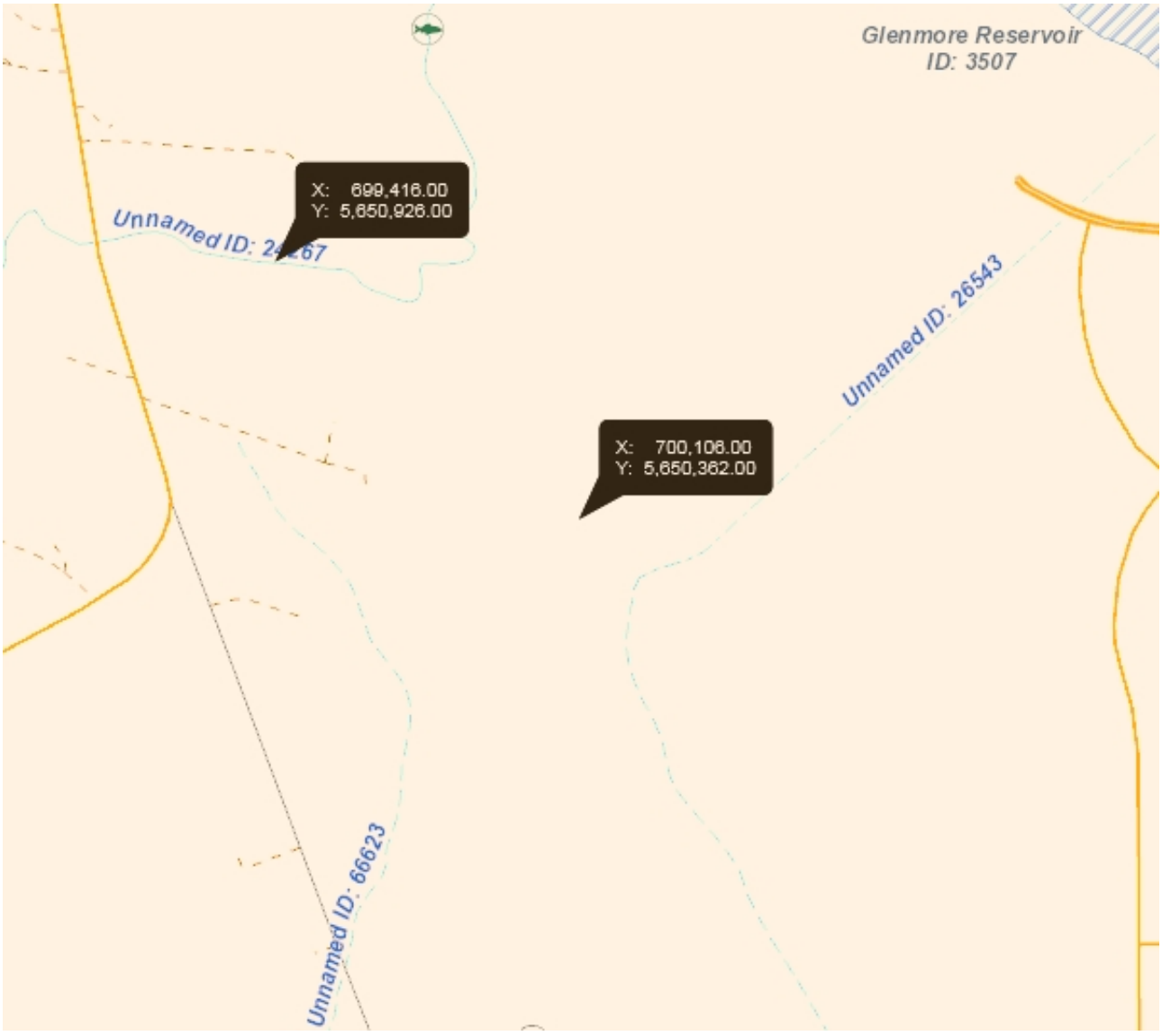
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:57

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:18

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
LAKE CHUB	BOBCAT	
LONGNOSE DACE	COUGAR	
LONGNOSE SUCKER	GREAT BLUE HERON	
MOUNTAIN WHITEFISH	LEAST FLYCATCHER	
PEARL DACE	LONG-TAILED WEASEL	
RAINBOW TROUT	PEREGRINE FALCON	
TROUT-PERCH	PRAIRIE FALCON	
WHITE SUCKER	SILVER-HAIRED BAT	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
560909, 5639194	10-TM AEP Forest	SW 6 23 1 5	3 kilometers

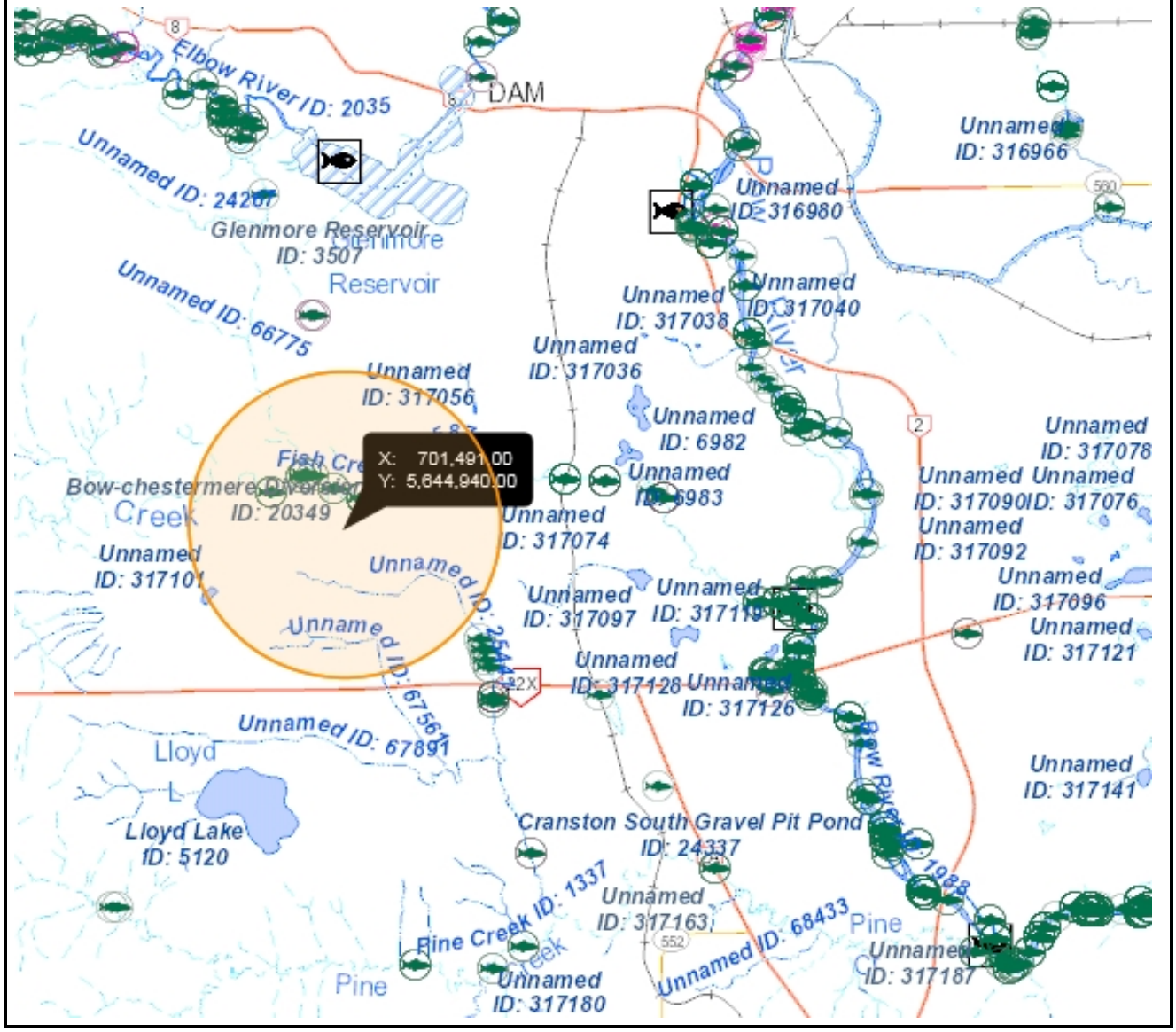
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:18

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:25

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
FATHEAD MINNOW	COUGAR	
LAKE CHUB	GREAT BLUE HERON	
LONGNOSE DACE	LONG-TAILED WEASEL	
LONGNOSE SUCKER	SORA	
PEARL DACE		
RAINBOW TROUT		
TROUT-PERCH		
WHITE SUCKER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561445, 5637037	10-TM AEP Forest	NE 30 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

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27-Oct-2016 15:25

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:22

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
FATHEAD MINNOW	COUGAR	
LAKE CHUB	GREAT BLUE HERON	
LONGNOSE DACE	LONG-TAILED WEASEL	
LONGNOSE SUCKER	SORA	
RAINBOW TROUT		
TROUT-PERCH		
WHITE SUCKER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
561175, 5636887	10-TM AEP Forest	NW 30 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

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27-Oct-2016 15:22

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 27-Oct-2016 15:41

Species present within the current extent :

Fish Inventory

- BROOK STICKLEBACK
- FATHEAD MINNOW

Wildlife Inventory

- BARN SWALLOW
- BAY-BREASTED WARBLER
- BLACK TERN
- BLACK-CROWNED NIGHT-HERON
- COUGAR
- GREAT BLUE HERON
- HORNED GREBE
- NORTHERN LEOPARD FROG
- OSPREY
- PIED-BILLED GREBE
- SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
564485, 5636060	10-TM AEP Forest	SW 28 22 1 5	3 kilometers

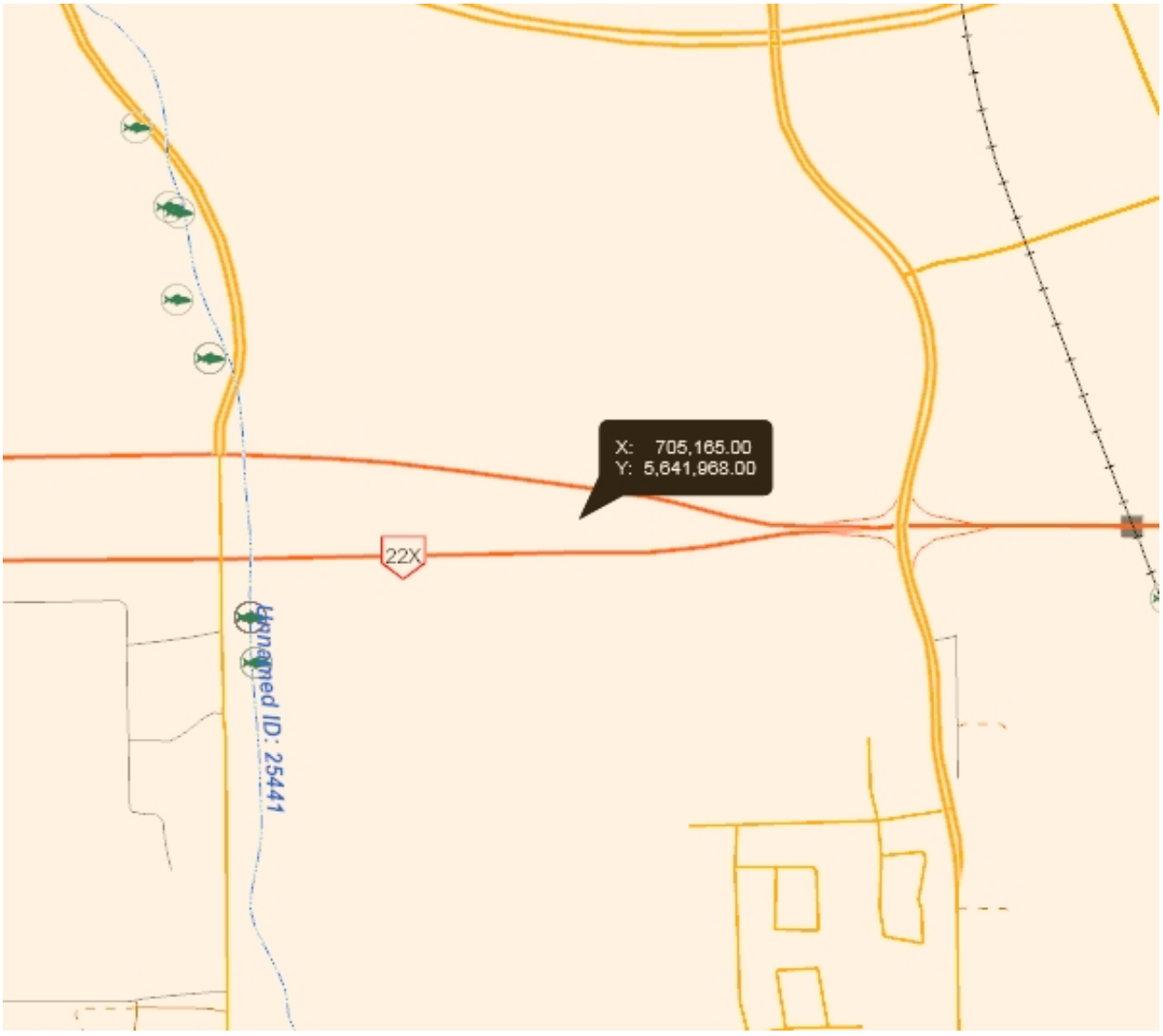
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

27-Oct-2016 15:41

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:35

Species present within the current extent :

Fish Inventory

- ARCTIC CHAR
- BROOK STICKLEBACK
- BROOK TROUT
- BROWN TROUT
- BULL TROUT
- BURBOT
- LONGNOSE DACE
- LONGNOSE SUCKER
- MOUNTAIN WHITEFISH
- RAINBOW TROUT
- WHITE SUCKER

Wildlife Inventory

- BALD EAGLE
- OSPREY
- PILEATED WOODPECKER
- SORA

Stocked Inventory

- CUTTHROAT TROUT
- RAINBOW TROUT

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
556465, 5649630	10-TM AEP Forest	SE 3 24 2 5	3 kilometers

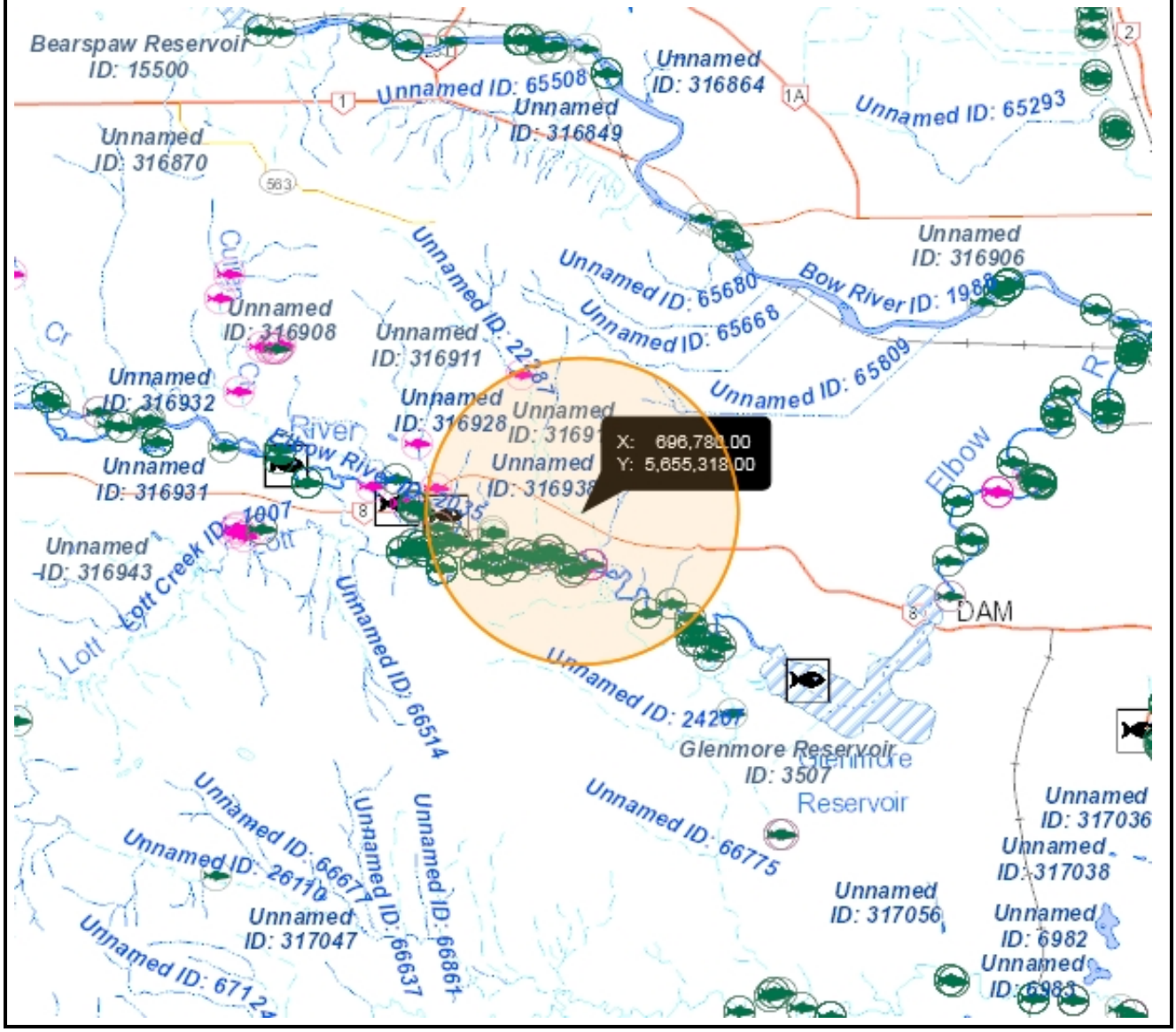
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:35

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:38

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BALD EAGLE	No Species Found in Search Extent
BROOK TROUT	BALTIMORE ORIOLE	
BROWN TROUT	COMMON YELLOWTHROAT	
BULL TROUT	COUGAR	
BURBOT	EASTERN PHOEBE	
CUTTHROAT TROUT	GREAT BLUE HERON	
LONGNOSE DACE	LEAST FLYCATCHER	
LONGNOSE SUCKER	OSPREY	
MOUNTAIN WHITEFISH	PIED-BILLED GREBE	
NORTHERN PIKE	PILEATED WOODPECKER	
RAINBOW TROUT	SORA	
WHITE SUCKER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
558014, 5647939	10-TM AEP Forest	SE 35 23 2 5	3 kilometers

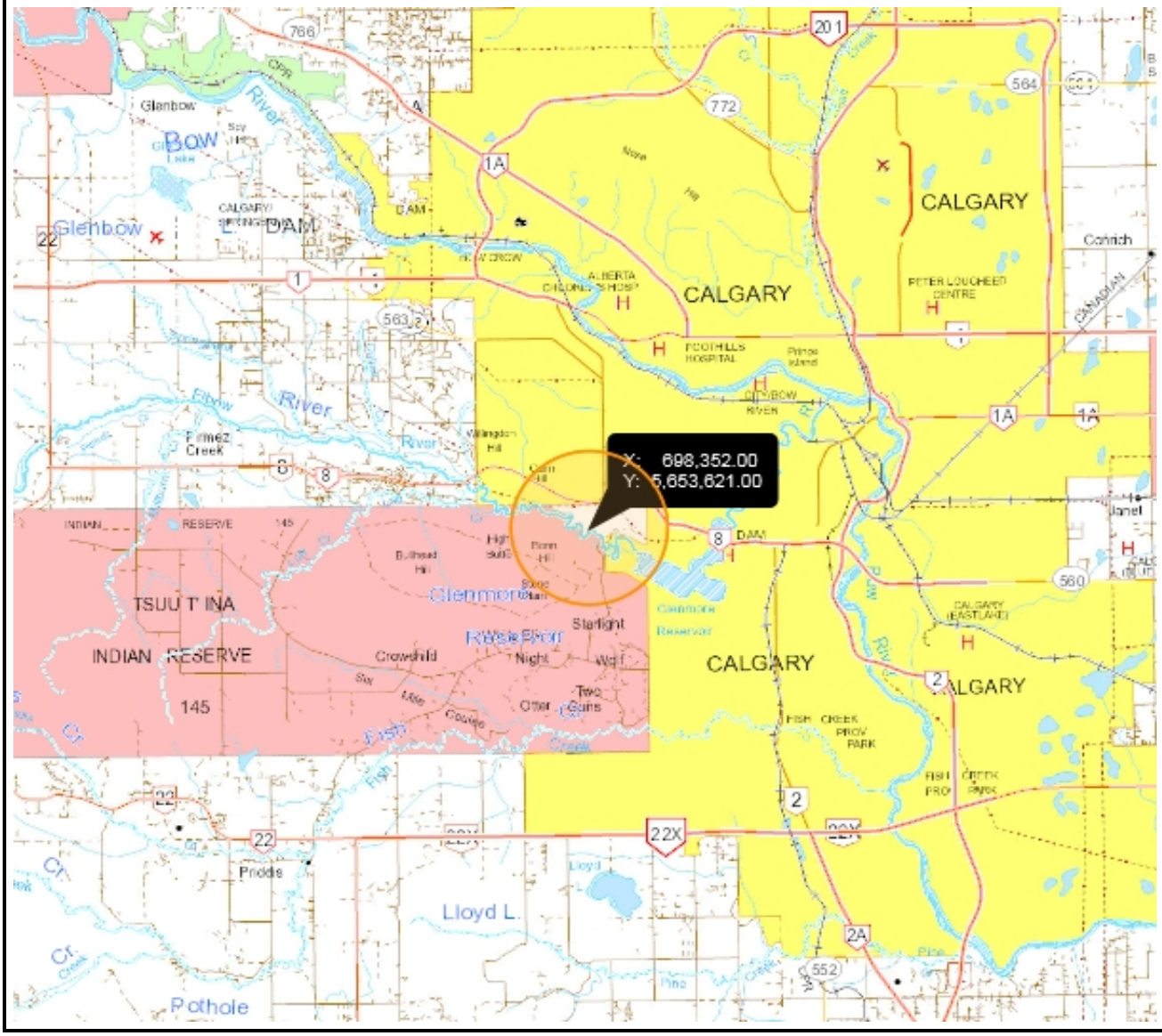
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:38

Map Results



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Alberta Environment and Parks

Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:40

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BALD EAGLE	No Species Found in Search Extent
BROOK TROUT	BALTIMORE ORIOLE	
BROWN TROUT	COMMON YELLOWTHROAT	
BULL TROUT	COUGAR	
BURBOT	EASTERN PHOEBE	
CUTTHROAT TROUT	GREAT BLUE HERON	
LONGNOSE DACE	LEAST FLYCATCHER	
LONGNOSE SUCKER	OSPREY	
MOUNTAIN WHITEFISH	PIED-BILLED GREBE	
NORTHERN PIKE	PILEATED WOODPECKER	
RAINBOW TROUT	SORA	
WHITE SUCKER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
558014, 5647939	10-TM AEP Forest	SE 35 23 2 5	3 kilometers

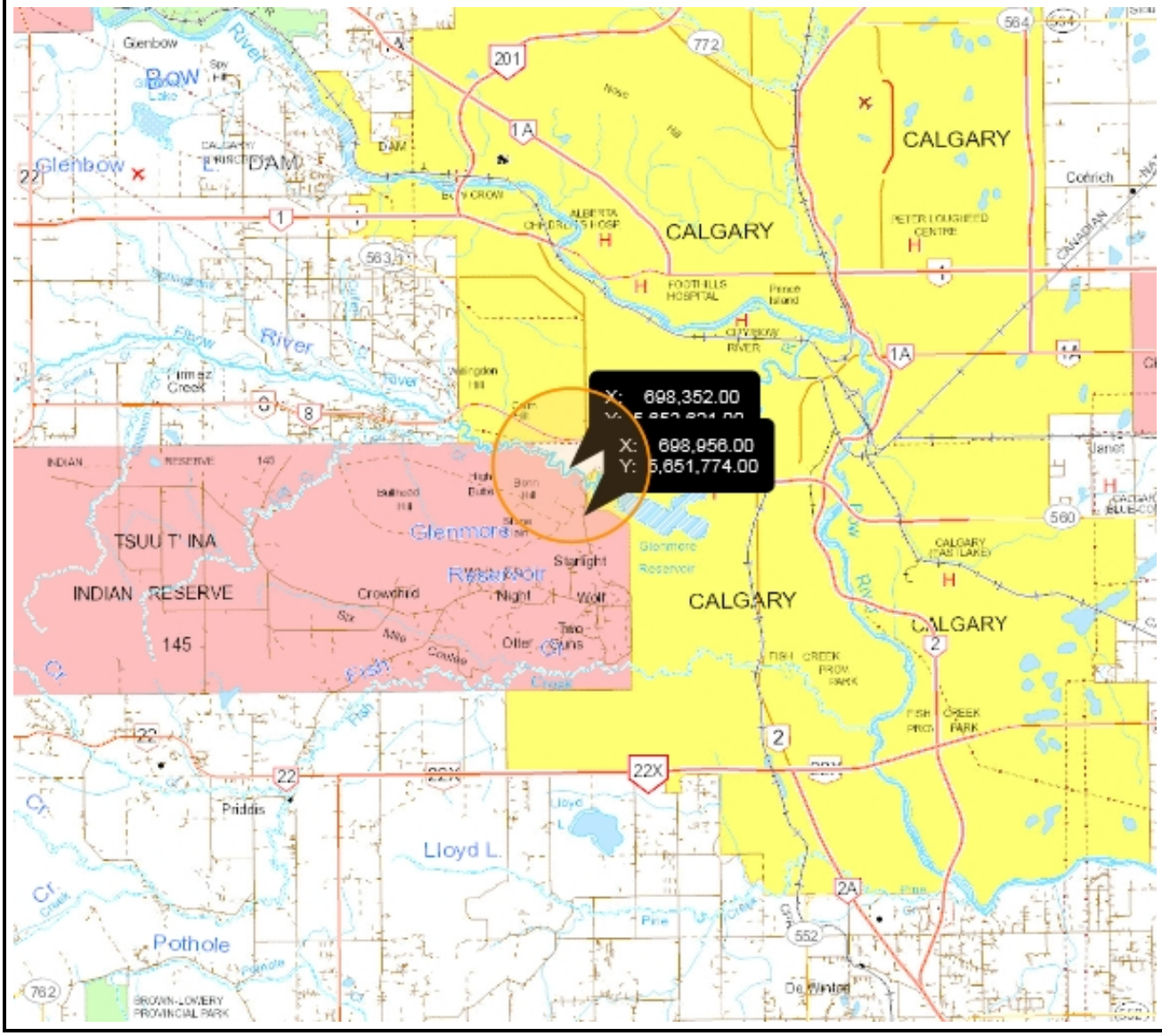
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:40

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:41

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
No Species Found in Search Extent	BOBCAT	KOKANEE
	EASTERN PHOEBE	LAKE TROUT
	GREAT BLUE HERON	RAINBOW TROUT
	LEAST FLYCATCHER	
	OLIVE-SIDED FLYCATCHER	
	PIED-BILLED GREBE	
	RED BAT	
	RED-SIDED GARTER SNAKE	
	SORA	
	WANDERING GARTER SNAKE	
	WESTERN TANAGER	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
559971, 5643781	10-TM AEP Forest	NE 13 23 2 5	3 kilometers

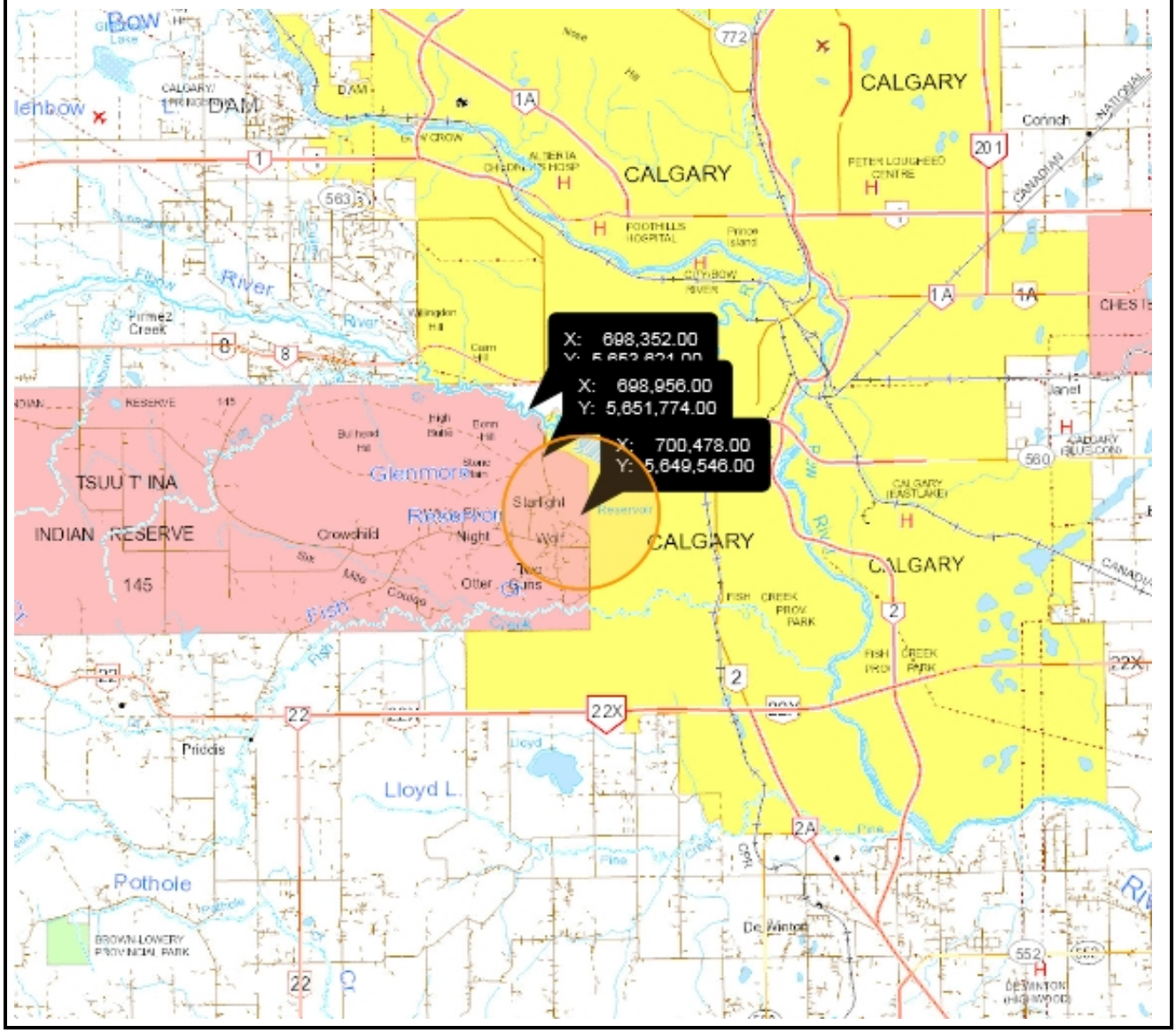
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:41

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:58

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
No Species Found in Search Extent	BOBCAT	No Species Found in Search Extent
	GREAT BLUE HERON	
	LEAST FLYCATCHER	
	OLIVE-SIDED FLYCATCHER	
	PIED-BILLED GREBE	
	RED BAT	
	RED-SIDED GARTER SNAKE	
	SORA	
	WESTERN TANAGER	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
560256, 5643210	10-TM AEP Forest	SE 13 23 2 5	3 kilometers

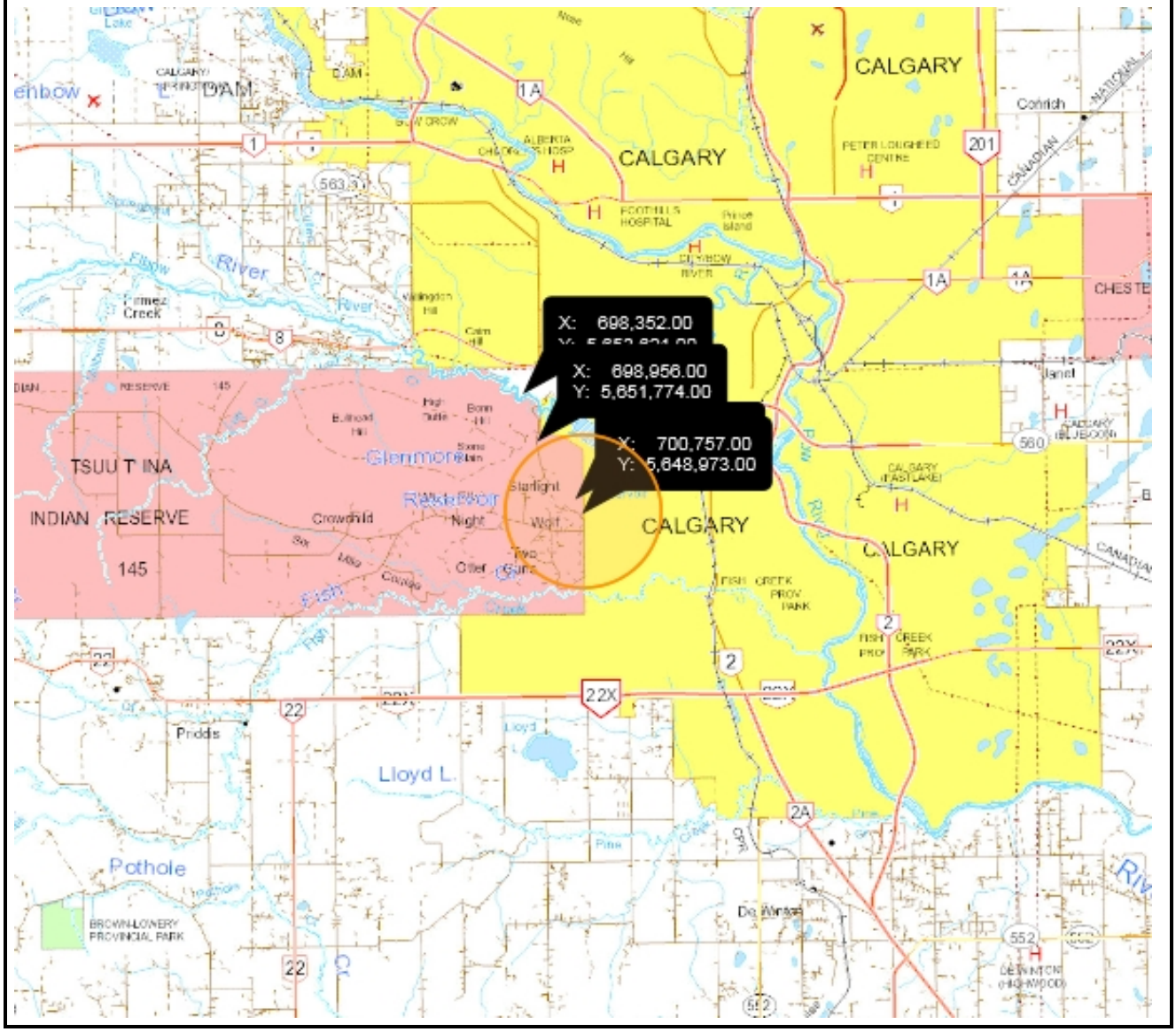
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:58

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 13:59

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	AMERICAN KESTREL	No Species Found in Search Extent
FATHEAD MINNOW	BARN SWALLOW	
	BLACK TERN	
	GREAT BLUE HERON	
	HORNED GREBE	
	PIED-BILLED GREBE	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
562050, 5636116	10-TM AEP Forest	SE 30 22 1 5	3 kilometers

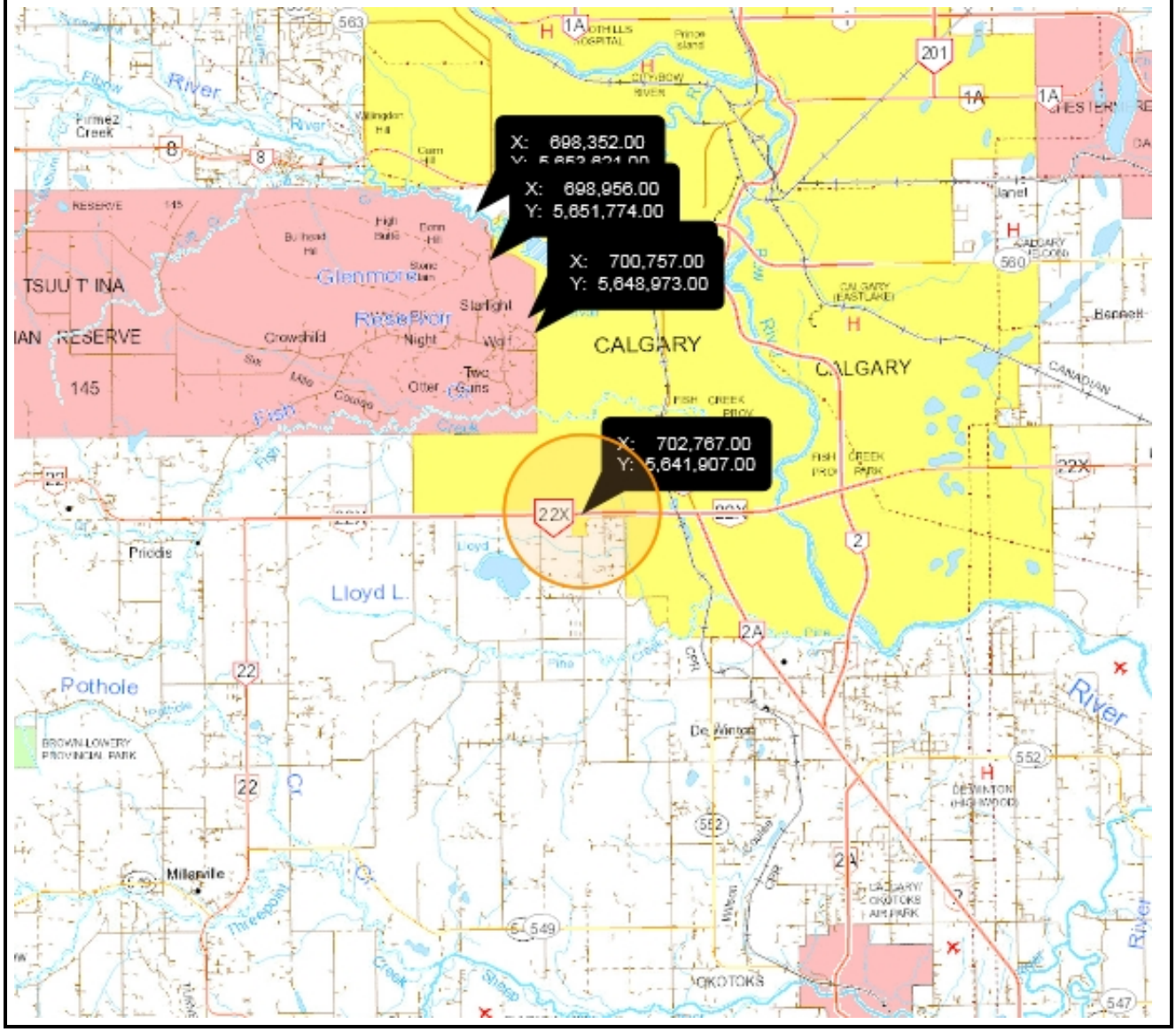
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 13:59

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:00

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BARN SWALLOW	No Species Found in Search Extent
FATHEAD MINNOW	BLACK TERN	
	HORNED GREBE	
	PIED-BILLED GREBE	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
562193, 5635892	10-TM AEP Forest	NW 20 22 1 5	3 kilometers

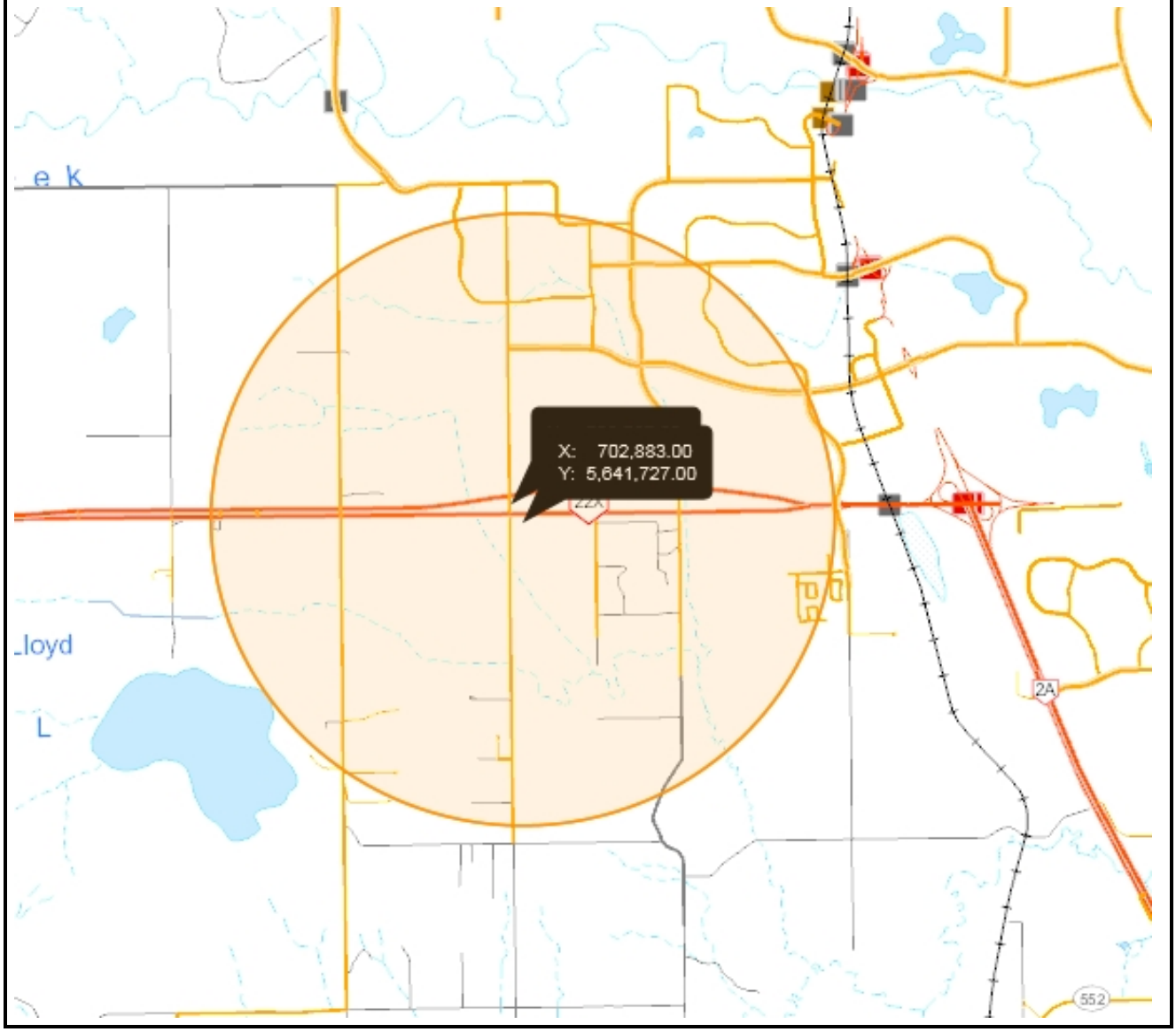
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:00

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:02

Species present within the current extent :

Fish Inventory

- BROOK STICKLEBACK
- FATHEAD MINNOW
- WHITE SUCKER

Wildlife Inventory

- BAY-BREASTED WARBLER
- BLACK TERN
- BLACK-CROWNED NIGHT-HERON
- COUGAR
- GREAT BLUE HERON
- HORNED GREBE
- NORTHERN LEOPARD FROG
- OSPREY
- PIED-BILLED GREBE
- SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
563742, 5635637	10-TM AEP Forest	NW 21 22 1 5	3 kilometers

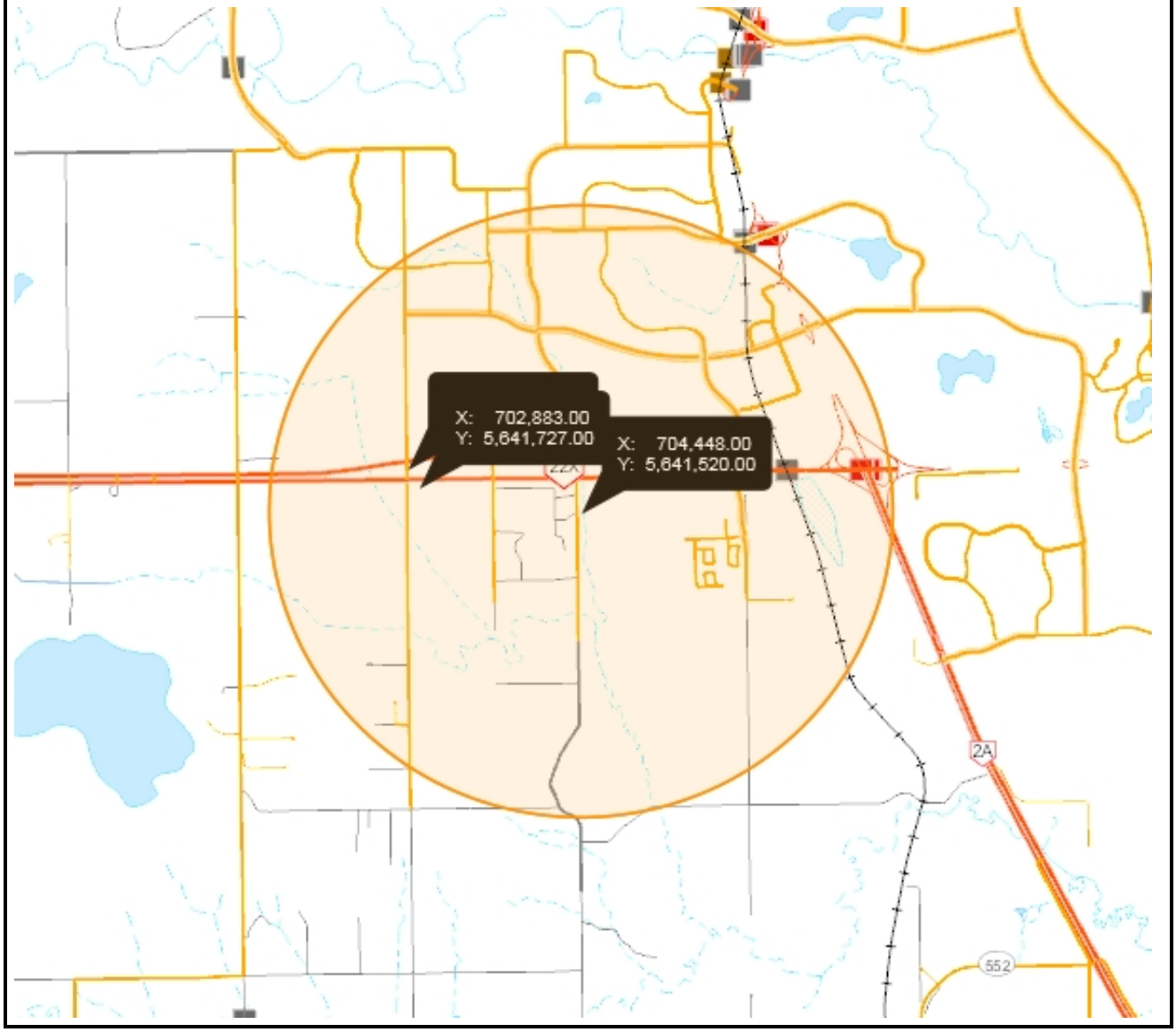
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:02

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:04

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BARN SWALLOW	No Species Found in Search Extent
FATHEAD MINNOW	BAY-BREASTED WARBLER	
	BLACK TERN	
	BLACK-CROWNED NIGHT-HERON	
	COUGAR	
	GREAT BLUE HERON	
	HORNED GREBE	
	NORTHERN LEOPARD FROG	
	OSPREY	
	PEREGRINE FALCON	
	PIED-BILLED GREBE	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
564588, 5635872	10-TM AEP Forest	NE 21 22 1 5	3 kilometers

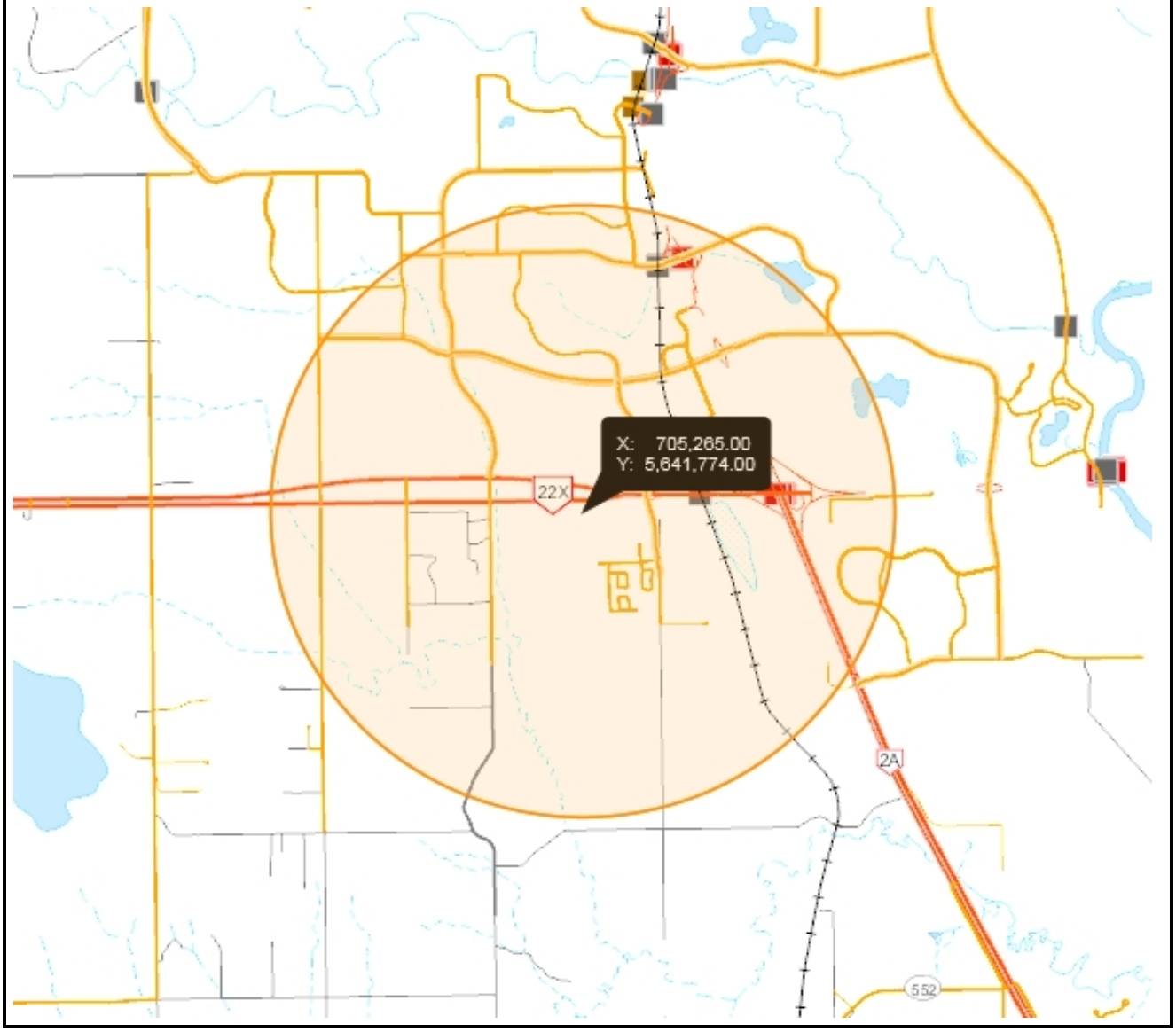
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:04

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:07

Species present within the current extent :

Fish Inventory

- BROOK STICKLEBACK
- FATHEAD MINNOW

Wildlife Inventory

- BARN SWALLOW
- BARRED OWL
- BAY-BREASTED WARBLER
- BLACK TERN
- BLACK-CROWNED NIGHT-HERON
- COUGAR
- GREAT BLUE HERON
- HORNED GREBE
- LONG-TAILED WEASEL
- NORTHERN LEOPARD FROG
- OSPREY
- PEREGRINE FALCON
- PIED-BILLED GREBE
- SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
565581, 5636234	10-TM AEP Forest	SW 27 22 1 5	3 kilometers

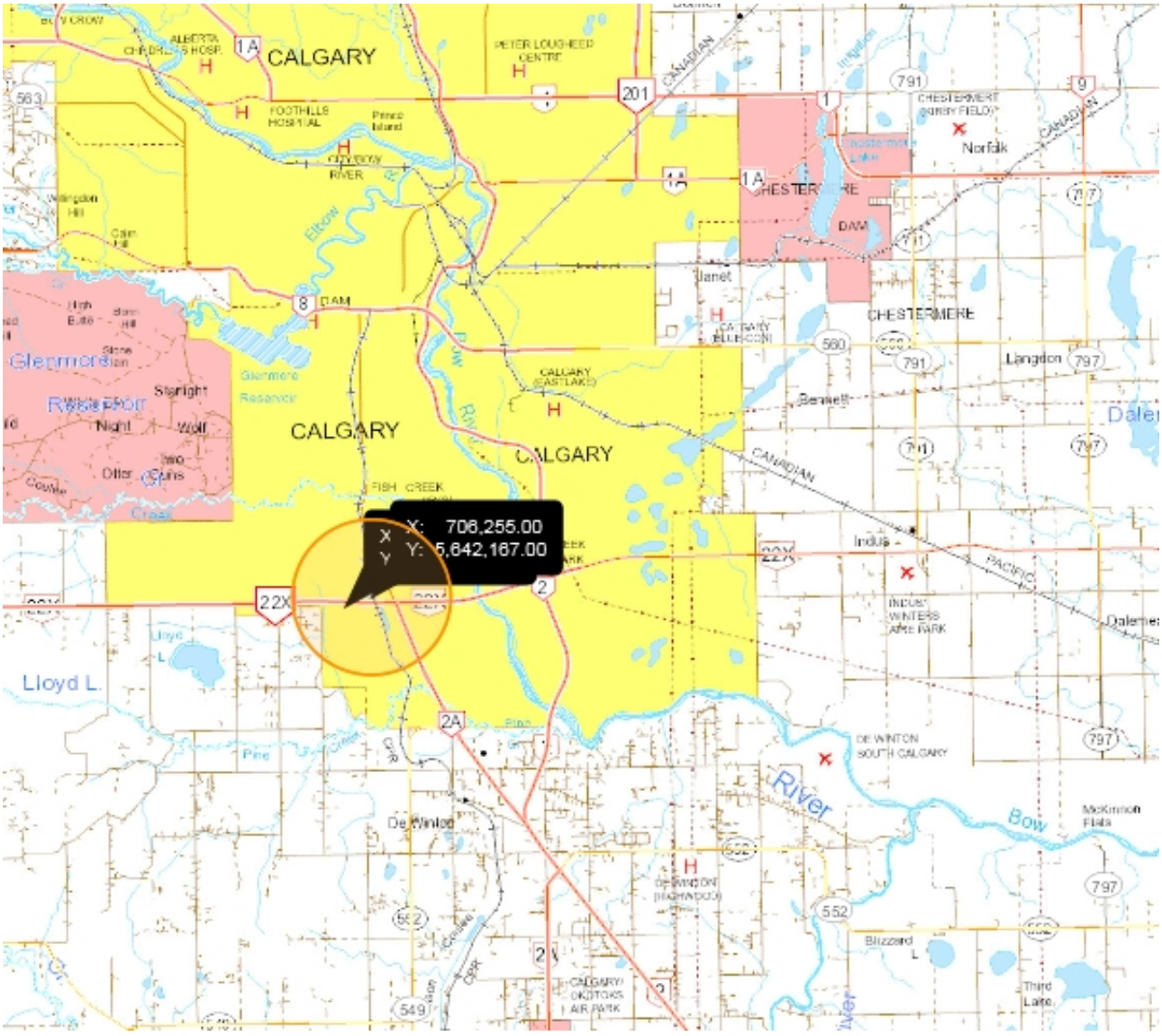
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:07

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:08

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BALTIMORE ORIOLE	No Species Found in Search Extent
FATHEAD MINNOW	BARN SWALLOW	
LAKE CHUB	BARRED OWL	
LONGNOSE DACE	BAY-BREASTED WARBLER	
LONGNOSE SUCKER	BLACK TERN	
TROUT-PERCH	BLACK-CROWNED NIGHT-HERON	
WHITE SUCKER	COUGAR	
	GREAT BLUE HERON	
	HORNED GREBE	
	LEAST FLYCATCHER	
	LONG-TAILED WEASEL	
	NORTHERN LEOPARD FROG	
	OSPREY	
	PEREGRINE FALCON	
	PIED-BILLED GREBE	
	SILVER-HAIRED BAT	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
566132, 5636840	10-TM AEP Forest	NE 27 22 1 5	3 kilometers

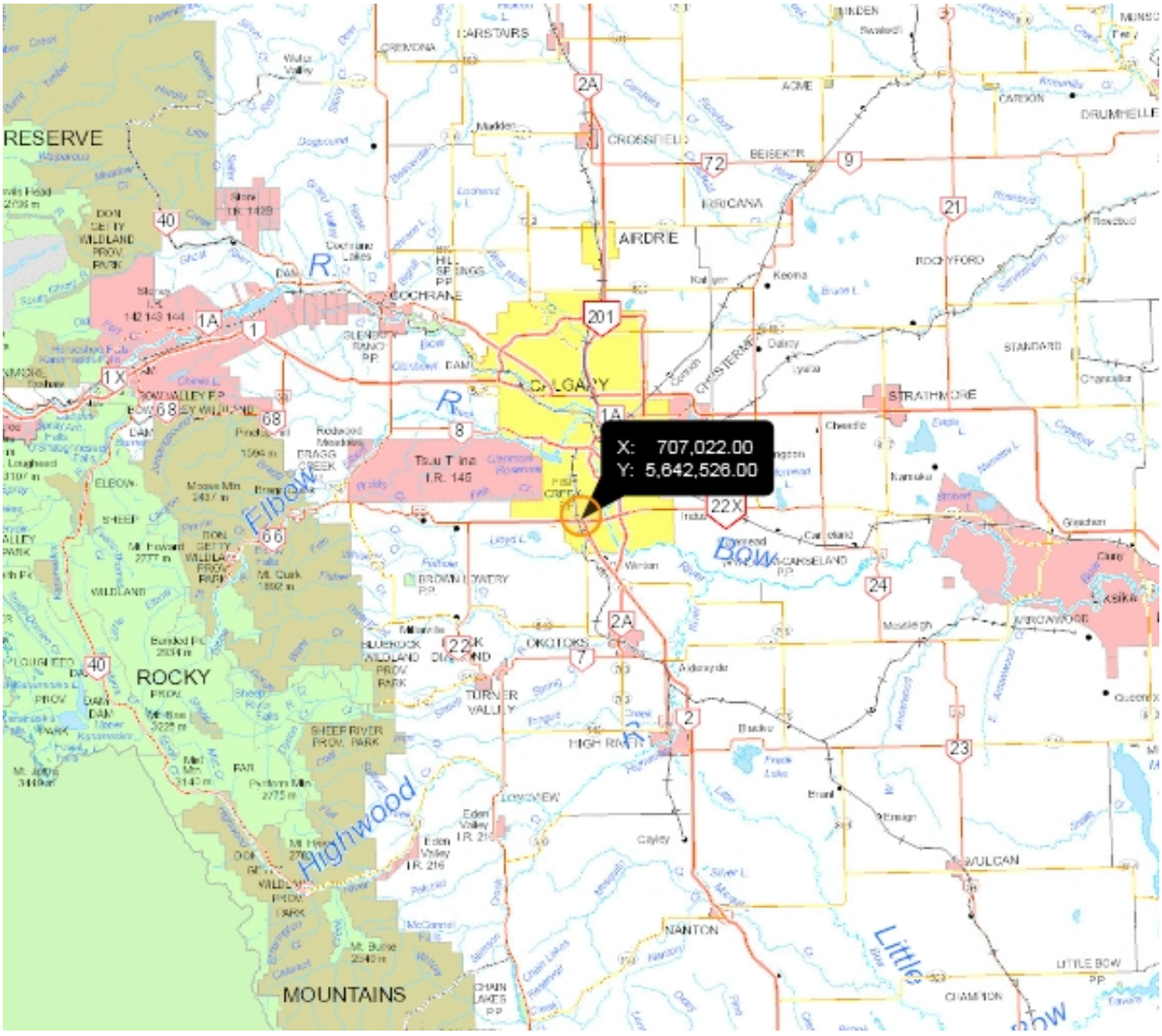
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:08

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:11

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BARN SWALLOW	No Species Found in Search Extent
FATHEAD MINNOW	BAY-BREASTED WARBLER	
	BLACK TERN	
	BLACK-CROWNED NIGHT-HERON	
	COUGAR	
	GREAT BLUE HERON	
	HORNED GREBE	
	LEAST FLYCATCHER	
	LONG-TAILED WEASEL	
	NORTHERN LEOPARD FROG	
	OSPREY	
	PEREGRINE FALCON	
	PIED-BILLED GREBE	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
565765, 5635800	10-TM AEP Forest	NW 22 22 1 5	3 kilometers

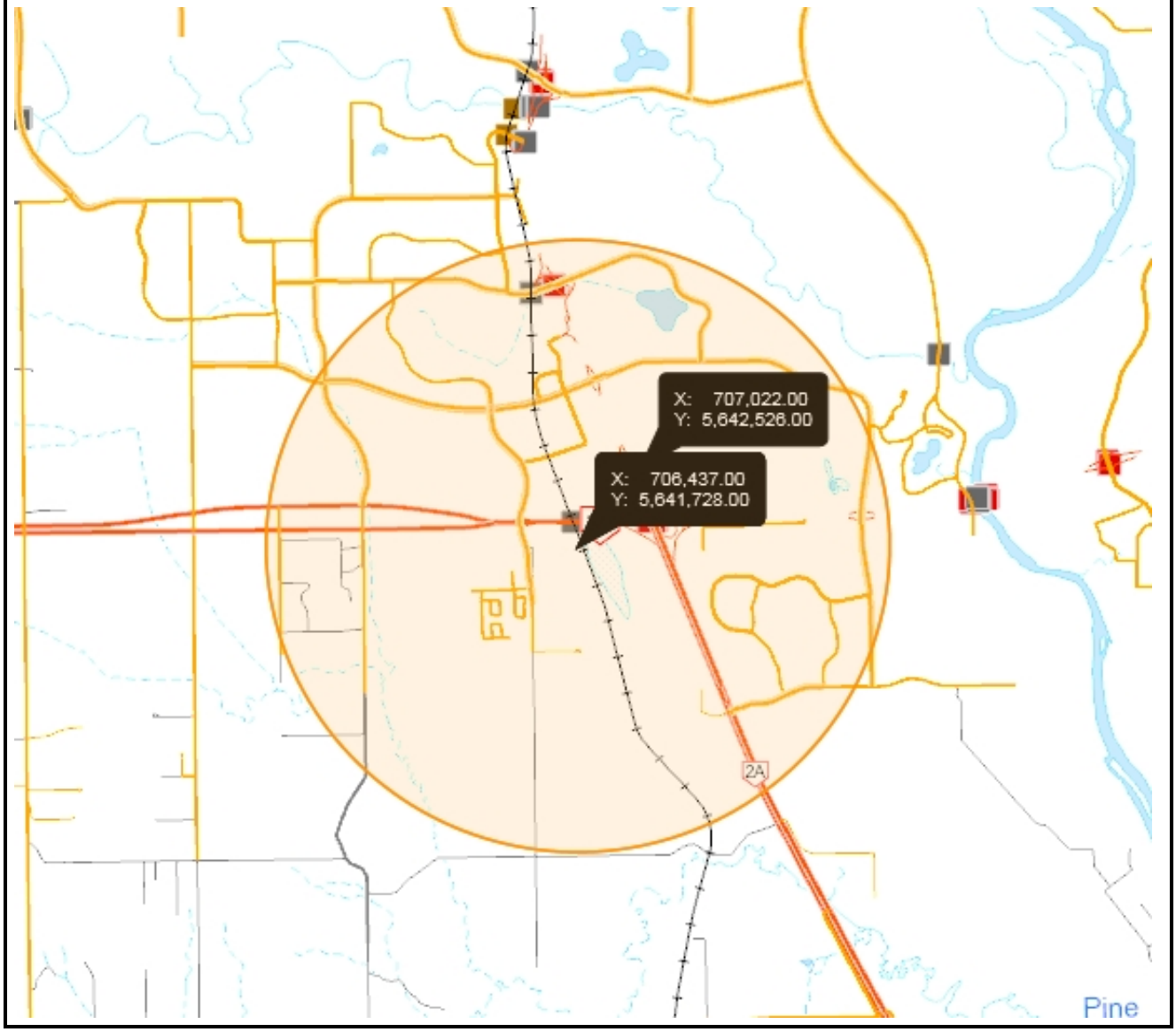
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:11

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:13

Species present within the current extent :

Fish Inventory

- BROOK STICKLEBACK
- FATHEAD MINNOW

Wildlife Inventory

- BALTIMORE ORIOLE
- BARN SWALLOW
- BAY-BREASTED WARBLER
- BLACK TERN
- BLACK-CROWNED NIGHT-HERON
- COUGAR
- GREAT BLUE HERON
- HORNED GREBE
- LEAST FLYCATCHER
- LONG-TAILED WEASEL
- NORTHERN LEOPARD FROG
- OSPREY
- PEREGRINE FALCON
- PIED-BILLED GREBE
- SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
565765, 5635800	10-TM AEP Forest	NW 22 22 1 5	3 kilometers

Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:13

Map Results

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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:15

Species present within the current extent :

Fish Inventory

- BROOK STICKLEBACK
- FATHEAD MINNOW
- LONGNOSE DACE
- WHITE SUCKER

Wildlife Inventory

- BALTIMORE ORIOLE
- BARN SWALLOW
- BAY-BREASTED WARBLER
- BLACK TERN
- BLACK-CROWNED NIGHT-HERON
- COMMON YELLOWTHROAT
- GREAT BLUE HERON
- HORNED GREBE
- LEAST FLYCATCHER
- LONG-TAILED WEASEL
- NORTHERN LEOPARD FROG
- OSPREY
- PEREGRINE FALCON
- PIED-BILLED GREBE
- SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
566543, 5634517	10-TM AEP Forest	SE 22 22 1 5	3 kilometers

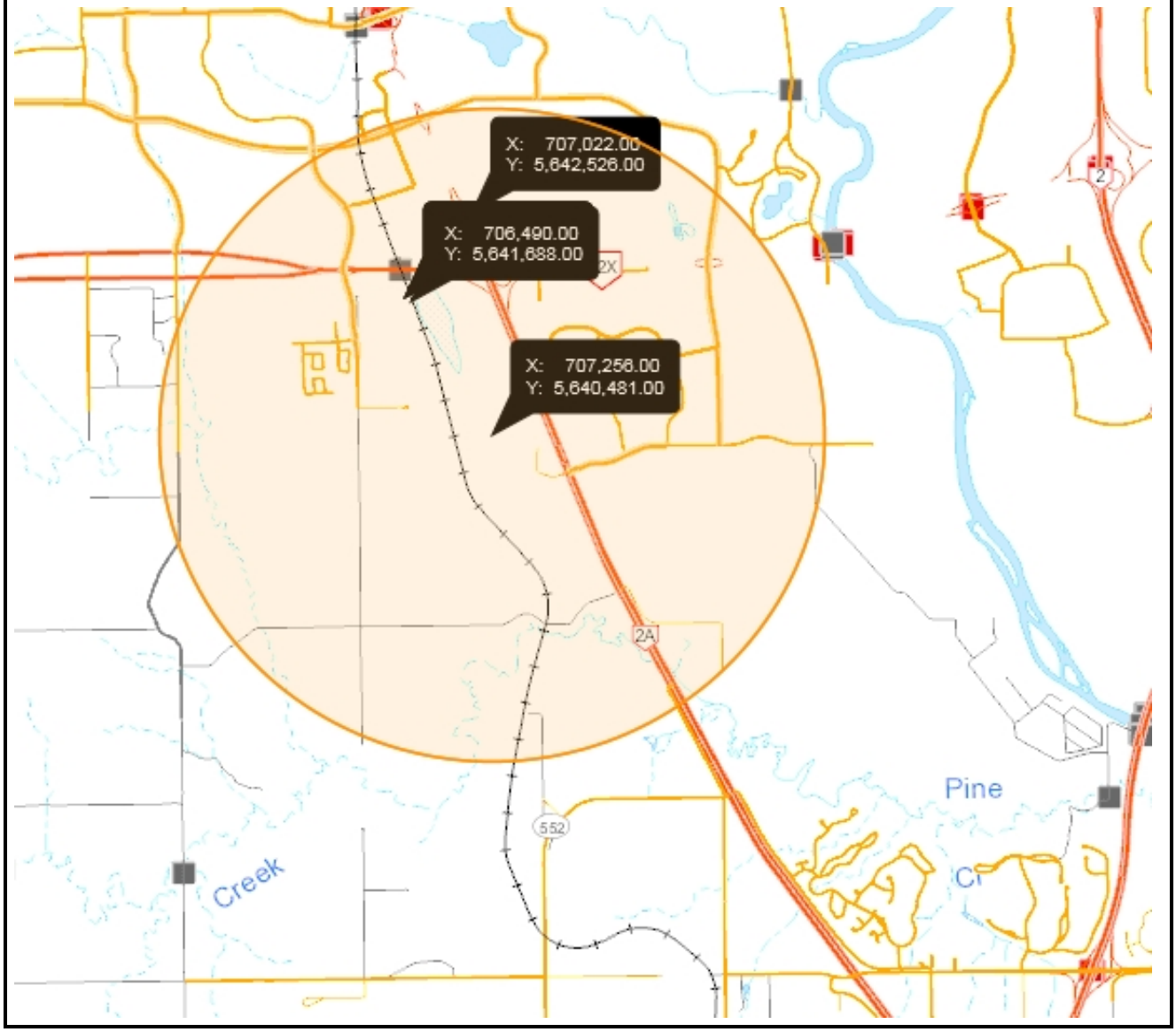
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:15

Map Results



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Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 22-Nov-2016 14:17

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	BALTIMORE ORIOLE	No Species Found in Search Extent
BROWN TROUT	BARN SWALLOW	
FATHEAD MINNOW	BARRED OWL	
LAKE CHUB	BAY-BREASTED WARBLER	
LONGNOSE DACE	BLACK TERN	
LONGNOSE SUCKER	BLACK-CROWNED NIGHT-HERON	
MOUNTAIN WHITEFISH	COUGAR	
RAINBOW TROUT	GREAT BLUE HERON	
TROUT-PERCH	HORNED GREBE	
WHITE SUCKER	LEAST FLYCATCHER	
	LONG-TAILED WEASEL	
	NORTHERN LEOPARD FROG	
	OSPREY	
	PEREGRINE FALCON	
	PIED-BILLED GREBE	
	SILVER-HAIRED BAT	
	SORA	

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
566749, 5635633	10-TM AEP Forest	NE 22 22 1 5	3 kilometers

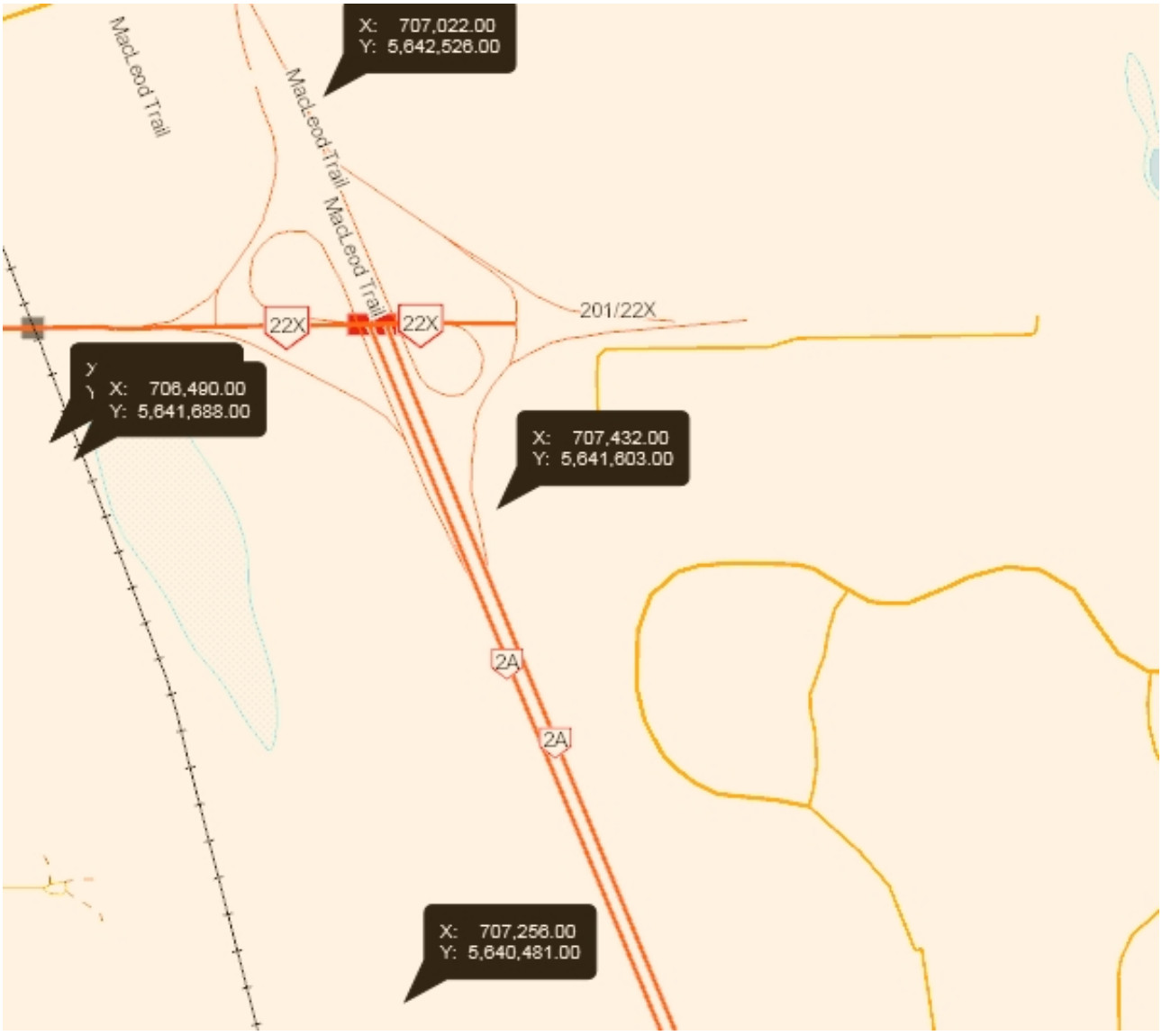
Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

22-Nov-2016 14:17

Map Results



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APPENDIX F

Documentation of Imagery Sources Used to Identify and Delineate Wetland Boundaries

Wetland ID	Legal Land Description	Photo Date mm/dd/year	Photo ID	Resolution	Season	AWCS Wetland Class	Precipitation Year	Precipiration Month (W, D, N)	Total Precipitation (mm) two weeks prior to photo date	Open Water Visible or Consistent Wetland Vegetation Signature	Assessment of Permanence	Photo Notes (Changes)
W01	NW 4-24-2-W5	1920	CA191_79	n/a	n/a	M-G(II)	n/a	n/a	n/a	W	Y	W01 is well defined and clearly visible, appears to have an open water zone.
W01	NW 4-24-2-W5	1950-07-09	AS168_ 32	1:40,000	Sum	n/a	n/a	n/a	n/a	DVI	N	W01 is not visible in 1949 photo. However, land disturbance and vegetation clearing around W01 has increased since 1920.
W01	NW 4-24-2-W5	1966-08-09	AS954_237	1:31,680	Sum	n/a	N	W	130.54	DVI	N	W01 is not visible in 1966 photo.
W01	NW 4-24-2-W5	1974-06-12	AS1316_076	1:31,680	Spr	M-G(II)	D	N	66.39	DVI	N	W01 is visible and appears to be dominated by graminoid vegetation or is cultivated. Visible signs of open water are not apparent in wetland basin.
W01	NW 4-24-2-W5	1984-07-03	AS3247_272	1:20,000	Sum	M-G(III)	N	N	71.98	DV	N	W01 is evident and appears larger than in 1974, possibly due a visible drainage channel running from a wetland to the north into W01. Wetland is dominated by graminoid vegetation.
W01	NW 4-24-2-W5	1993-05-01	AS4379_170	1:25,000	Spr	W-A(IV)	W	N	45.79	W	Y	W01 is dominated by open water, and drainage channel running from a wetland to the north is clearly visible.
W01	NW 4-24-2-W5	2008-05-31	AS5436B_93	1:20,000	Spr	M-G(III)	W	W	567.06	DV	N	W01 is clearly visible in 2003 image but appears drier than in 1993.
W04	SE 3-24-2-W5	1927-04-21	CA232_74	1:10,000	Spr	M-G(III)	n/a	n/a	n/a	DV	N	W04 appears as a long intermittent natural drainage feature with well-developed wetland components. Portions of the natural drainage channel are wide enough to support shrubby swamp wetland characteristics. The wetland basin is most likely feed from a combination of surface flow within the catchment area and groundwater discharge which ultimately drains into the Elbow River floodplain. Road infrastructure of the present day Lower Springbank Road SW, bisects the wetland and may be inhibiting surface flow southward and contributing to more substantial wetland development on the north side of the road and reduced flow on the south side of the road. The surrounding land use is predominantly agriculture , native shrubland and grassland.
W04	SE 3-24-2-W5	1950-07-09	AS168_ 32	1:40,000	Sum	M-G(III)	n/a	n/a	n/a	DV	N	Although the image quality is poorer than the 1927 image, the wetland area is visibly less prominent within the natural drainage area suggesting it was a drier period than the previous image. Additionally, an increase in agricultural activity may have contributed to reduced surface water inflows to the wetland system.
W04	SE 3-24-2-W5	1966-08-09	AS954_238	1:31,680	Sum	M-G(II)	N	N	130.54	DVI	N	W04 is difficult to discern and appears drier in 1966 than in 1949. Vegetation has been cleared in the northern portion of the wetland and this portion of the wetland is now dominated by graminoid vegetation. No open water is evident. A faint drainage channel is visible at the southern tip of the wetland, and land use is dominated by agricultural activities to the north and east of the wetland. The shrubby swamp wetland component remains in the most northern section of the wetland. However, intensification of agricultural activity within the primary primary wetland basin and surrounding land has decreased the visibility of the wetland boundaries. The extent and intensity of cultivation within the wetland basin indicate drier than normal conditions. Lower Springbank Road, which bisects the wetland, appears to be well developed and possibly paved. The section of the wetland south of this road appears to have decreased in extent and visibility suggesting that poor culverting and drought may have reduced much of the historical water flow south of the road.
W04	SE 3-24-2-W5	1974-06-12	AS1316_076	1:31,680	Spr	M-G(II)	D	N	66.39	DV	N	W04 is similar in size and condition to its appearance in 1966. W04 is fully vegetated and relatively dry with no open water evident. Agricultural and drainage activities are evident in the north portion of the wetland. Heavy agricultural activity continues to impact the wetland north of Lower Springbank Road. Evidence of some berming can also be seen north of Lower Springbank Road. The natural drainage is less prominent south of the road suggesting further decrease in southward water flow.
W04	SE 3-24-2-W5	1984-06-17	AS3247_91	1:20,000	Sum	M-G(III)	N	N	403.54	DV	N	W04 is clearly visible in the 1984 image indicating it was a wet year. Previous clearing and cultivation of the wetland has resulted in a change in dominant vegetation structure and composition from a shrubby swamp to a graminnoid marsh with some smaller areas of shrubby swamp remaining in the far northern section. Lower Springbank Road continues to bisect the wetland basin with distinct natural drainage channels on the north and south sides of the road. Similar to the previous two decades, the wetland area and drainage channel south of the road are less prominent suggesting water flow southward has been reduced by the road infrastructure. The surrounding land use consists primarily of agriculture on the north side of the road and native grassland and shrublands on the south side of the road.
W04	SE 3-24-2-W5	1993-05-11	AS4379_48	1:8,000	Spr	M-G(IV)	W	N	45.79	W	Y	W04 is clearly visible and extends to the north of the Project Site. W04 appears wetter than in 1984 with open water visible in the central portion of the wetland. W04 is fully vegetated and mainly dominated by graminoid vegetation with shrub cover and open water visible in the central portions of the wetland. Highway 8 development and surrounding residential areas have significantly increased impacts to W04. The surface flow south of Lower Springbank Road and Highway 8 have been further diminished and the southern drainage channel has been heavily impacted by sand/gravel mining developments. Berming effects from Lower Springbank Road are evident from the visible open water on the north side of the road. However, increased urban development to the northeast of W04 has likely further decreased surface water inflow through diversion into the urban stormwater system.
W04	SE 3-24-2-W5	2008-05-31	AS5436B_93	1:20,000	Spr	S-S(III)	W	W	567.06	DV	N	W04 is significantly smaller than in the 1998 image because of extensive urban development in the area. W04 is now bordered by roads and housing subdivisions on all sides. The wetland remnant is fully vegetated with shrubby vegetation. Major road infrastructure development, including the 69 Street SW interchange as well as the Springbank and Discovery Ridge residential areas, have dramatically reduced the extent of the wetland to an isolated remnant shrubby swamp similar in scale to its current area. Residential development surrounding the wetland now intercepts the majority of surface and subsurface flows through stormwater systems. The remnant wetland area appears to be primarily fed through precipitation and runoff from the road infrastructure.
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	1926	CA244_44	n/a	n/a	W-A(IV)	n/a	n/a	n/a	W	Y	A trail or road bisects W06 twice, suggesting anthropogenic activity around the wetland prior to 1926. W06 is dominated by what appears to be shrubby and graminoid vegetation.
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	1950-07-09	AS168_33	1:40,000	Sum	W-A(IV)	n/a	n/a	n/a	W	Y	W06 is clearly visible, however it appears drier than in 1926. Open water is visible in the eastern portion of the wetland. Visible road bisecting wetland system.
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	1966-08-09	AS0954_239	1:31,680	Sum	W-A(IV)	N	N	130.54	W	Y	W06 is well defined in 1966. A berm appears to have been constructed near the connection of the wetland with watercourse WC01. The central portion of the wetland appears drier and fully vegetated with shrubby vegetation, while the eastern and western components are wetter and dominated by graminoid vegetation and patches of open water.
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	1974-06-12	AS1316_47	1:31,680	Spr	W-A(IV)	D	N	66.39	W	Y	W06 is similar in size, but wetter than in 1966. The eastern tip of the wetland is dominated by shrubby vegetation, while the central and western portions are mostly covered by open water.
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	1984-06-17	AS3247_73	1:20,000	Sum	W-A(IV)	N	N	403.54	W	Y	The eastern portion of W06 appears similar to previous years and is dominated by shrubby vegetation, whereas the central and western portions of the wetland are dominated by graminoid vegetation.

Wetland ID	Legal Land Description	Photo Date mm/dd/year	Photo ID	Resolution	Season	AWCS Wetland Class	Precipitation Year	Precipiration Month (W, D, N)	Total Precipitation (mm) two weeks prior to photo date	Open Water Visible or Consistent Wetland Vegetation Signature	Assessment of Permanence	Photo Notes (Changes)
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	1993-05-01	AS4379_180	1:25,000	Spr	W-A(IV)	W	N	45.79	W	Y	W06 appears wetter than in 1984. Graminoid vegetation and open water are evident in the western and central portions of the wetland, while the eastern portion has more shrub cover
W06	NE 26-23-2-W5, NW 25-23-2-W5, SW 25-23-2-W5	2005-05-29	AS5321B_67	1:20,000	Spr	W-A(IV)	W	W	83.87	W	Y	W06 appears similar in size and condition to previous years. Standing water is visible in the central and western portions of the wetland, and the eastern portion of the wetland is dominated by shrubby vegetation.
W07	SW 25-23-2-W5	1926	CA244_44	n/a	n/a	S-S(III)	n/a	n/a	n/a	DV	N	W07 is well defined and appears to be part of a contiguous system with W08. The southern portion of the wetland appears to be wetter with some open water visible, whereas the northern portion appears drier and dominated by shrubby and graminoid vegetation.
W07	SW 25-23-2-W5	1950-09-07	AS168_33	1:40,000	Sum	S-S(III)	n/a	n/a	n/a	DV	N	W07 and W08 are clearly visible and part of one wetland system in 1949. The wetland appears to be drier than in 1926 with a wetter area near the southwestern end. Shrubby and graminoid vegetation occur throughout the wetland basin, and signs of agricultural activity are visible to the east and west of the wetland.
W07	SW 25-23-2-W5	1966-08-09	AS0954_239	1:31,680	Sum	S-S(III)	N	N	130.54	DV	N	W07 and W08 are clearly visible and are part of one wetland system in 1966. The southern portion of the wetland has been cleared and is now dominated by graminoid vegetation whereas the northern portion is dominated by shrubby vegetation. No signs of open water are visible, and the land around W07 and W08 is used for agriculture.
W07	SW 25-23-2-W5	1974-06-12	AS1316_47	1:31,680	Spr	S-S(III)	D	N	66.39	DV	N	W07 and W08 are visible and part of one wetland system that appears similar in size and condition to previous decades.
W07	SW 25-23-2-W5	1984-06-17	AS3247_73	1:20,000	Sum	S-S(III)	N	N	403.54	DV	N	W07 and W08 are part of one wetland system and are clearly visible in 1984. The wetland appears similar in size and conditions to 1974. Trees and shrubs are establishing within the central and northern parts of the wetland, but graminoid cover persists within the southern part of the wetland. No changes to the surrounding land use are apparent in the immediate vicinity of the wetlands.
W07	SW 25-23-2-W5	1993-05-01	AS4379_180	1:25,000	Spr	S-S(III)	W	N	45.79	DV	N	W07 and W08 are visible and part of one wetland system. Agricultural activity is evident in the southern portion of the wetland where vegetation appears to have been cleared. The northern end of the wetland remains vegetated and is dominated by shrubs.
W07	SW 25-23-2-W5	2005-05-29	AS5321B_67	1:20,000	Spr	S-S(III)	W	W	83.87	DV	N	Wetlands W07 and W08 are clearly visible and part of one wetland system that is similar in size and condition to previous years. Vegetation in the southern portion has grown back and is dominated by graminoid cover with patches of shrubby vegetation. Agricultural activity is visible along both sides of the wetland.
W08	SE 26-23-2-W5, SW 25-23-2-W5	1926	CA244_44	n/a	n/a	S-S(III)	n/a	n/a	n/a	DV	N	Same wetland basin as W07.
W08	SE 26-23-2-W5, SW 25-23-2-W5	1950-07-09	AS168_33	1:40,000	Sum	S-S(III)	n/a	n/a	n/a	DV	N	Same wetland basin as W07.
W08	SE 26-23-2-W5, SW 25-23-2-W5	1966-08-09	AS0954_239	1:31,680	Sum	S-S(III)	N	N	130.54	DV	N	Same wetland basin as W07.
W08	SE 26-23-2-W5, SW 25-23-2-W5	1974-06-12	AS1316_47	1:31,680	Spr	S-S(III)	D	N	66.39	DV	N	Same wetland basin as W07.
W08	SE 26-23-2-W5, SW 25-23-2-W5	1984-06-17	AS3247_73	1:20,000	Sum	S-S(III)	N	N	403.54	DV	N	Same wetland basin as W07.
W08	SE 26-23-2-W5, SW 25-23-2-W5	1993-05-01	AS4379_180	1:25,000	Spr	S-S(III)	W	N	45.79	DV	N	Same wetland basin as W07.
W08	SE 26-23-2-W5, SW 25-23-2-W5	2005-05-29	AS5321B_67	1:20,000	Spr	S-S(III)	W	W	83.87	DV	N	Same wetland basin as W07.
W09	NW-24-23-2-W5	1920	CA187_015	n/a	n/a	M-G(II)	n/a	n/a	n/a	DVI	N	W09 is difficult to discern in the 1920 image. W09 appears to be dominated by graminoid vegetation, and signs of agricultural activity are visible north of the wetland. A watercourse runs through the wetland and extends to the east and west of the wetland.
W09	NW-24-23-2-W5	1950-07-09	AS168_33	1:40,000	Sum	M-G(II)	n/a	n/a	n/a	DVI	N	W09 is difficult to discern in 1949, and it appears drier than in 1926. Watercourse WC01 is visible as a faint line both east and west of the wetland, as well as within the wetland boundary. Agricultural activity is visible to the north of the wetland.
W09	NW-24-23-2-W5	1966-08-09	AS0954_200	1:31,680	Sum	M-G(II)	N	N	130.54	DVI	N	W09 is difficult to discern in 1966. The wetland appears drier than in previous decades and is dominated by open graminoid vegetation. The area to the north of the wetland has been cleared for agriculture, while the area to the south is dominated by shrubby vegetation.
W09	NW-24-23-2-W5	1974-06-12	AS1316_47	1:31,680	Spr	M-G(III)	D	N	66.39	DVI	N	W09 is more visible than in previous years and is dominated by graminoid vegetation.
W09	NW-24-23-2-W5	1984-08-16	AP3247_073	1:20,000	Sum	M-G(IV)	N	N	118.51	W	Y	W09 is more distinct and appears wetter than in previous years. Standing water is visible in the eastern portion of the wetland, and the wetland appears to be dominated by graminoid vegetation with scattered shrubs.
W09	NW-24-23-2-W5	1993-05-01	AS4379_180	1:25,000	Spr	M-G(III)	W	N	45.79	DV	N	W09 is indistinct and difficult to discern and appears drier than in 1984. Agricultural activity and trails are visible in the wetland and surrounding area. Shrubs appear to be establishing in the western graminoid portion of the wetland. Faint linear features, which appear to be man-made trails, are evident extending from the wetland, and the eastern portion of the wetland has been cleared.
W09	NW-24-23-2-W5	2008-09-25	AS5457B_245	1:20,000	Fall	M-G(III)	W	W	130.48	DV	N	W09 is more distinct and is similar in size and condition compared to 1993. The central portion of the wetland is wetter and dominated by graminoid cover.
W10	SE 24-23-2-W5	1920	CA187_015	n/a	n/a	M-G(II)	n/a	n/a	n/a	DVI	N	W10 is clearly visible and appears to be dominated by graminoid vegetation.
W10	SE 24-23-2-W5	1950-05-12	AS0169_138	1:40,000	Spr	M-G(III)	n/a	n/a	n/a	DV	N	W10 is well defined, and the wetland boundary is similar to that observed in 1920. A wetter spot is evident near the centre of W10, and the wetland appears to be surrounded by natural shrubby and graminoid vegetation.
W10	SE 24-23-2-W5	1962-09-19	AS831_32	1:31,680	Fall	M-G(III)	D	N	208.33	DV	N	W10 is visible in this image and appears drier than in 1949. W10 is dominated by graminoid vegetation and surrounded by patches of trees and shrubby vegetation. No signs of anthropogenic disturbances are evident within or around W10.
W10	SE 24-23-2-W5	1974-06-12	AS1316_47	1:31,680	Spr	M-G(II)	D	N	66.39	DVI	N	W10 is visible and fully vegetated, and the surrounding land continues to be dominated by natural shrub and graminoid vegetation.
W10	SE 24-23-2-W5	1984-08-16	AS3085_267	1:20,000	Sum	M-G(III)	N	N	118.51	DV	N	W10 is visible and persistent in 1984.
W10	SE 24-23-2-W5	1993-05-01	AS4379_180	1:25,000	Spr	M-G(II)	W	N	45.79	DVI	N	W10 is difficult to discern but appears persistent.
W10	SE 24-23-2-W5	2008-09-25	AS5457B_245	1:20,000	Fall	M-G(II)	W	W	130.48	DVI	N	W10 does not appear to have changed since 1993, and continues to be surrounded by natural shrubby vegetation.
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1920	CA187_015	n/a	n/a	W-A(IV)	n/a	n/a	n/a	W	Y	W11 and W12 occur as a single basin in 1920. Wetland appears naturally vegetated and likely dominated by graminoid species. Patches of open water are visible in the southern portion of the wetland.
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1926-05-26	CA185_094	n/a	Fall		n/a	n/a	n/a			
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1950-05-12	AS0169_138	1:40,000	Spr	W-A(IV)	n/a	n/a	n/a	W	Y	Wetlands W11 and W12 are distinct and again appear as a single basin. Open water is visible within deeper basin components in the northern and central portions of the wetland. Agricultural activity is visible to the east of the wetland complex, and a farmyard has been developed adjacent to the southwestern component of this large wetland system.
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1966-08-09	AS0954_200	1:31,680	Sum	M-G(III)	N	N	130.54	DV	N	W11 and W12 are distinct and appear as a single basin dominated by graminoid vegetation, and the wetland is drier than in 1949. A road has been constructed through the south end of the wetland, and agricultural activity is evident to the east of the wetland.

Wetland ID	Legal Land Description	Photo Date mm/dd/year	Photo ID	Resolution	Season	AWCS Wetland Class	Precipitation Year	Precipiration Month (W, D, N)	Total Precipitation (mm) two weeks prior to photo date	Open Water Visible or Consistent Wetland Vegetation Signature	Assessment of Permanence	Photo Notes (Changes)
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1974-06-12	AS1316_48	1:31,680	Spr	W-A(IV)	D	N	66.39	W	Y	W11 and W12 are clearly visible and appear as a single basin with areas of open water evident throughout central and southern portions of the wetland. An extensive residential housing development is visible to the east of the central portion of the wetland, while the land surrounding the northern and southern portions of the wetland is less disturbed.
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1984-08-16	AS3085_267	1:20,000	Sum	M-G(IV)	N	N	118.51	DV	N	Most of the south end of wetlands W11 and W12 was lost when a new housing development was built between 1974 and 1984. The wetland was separated into two wetlands by the establishment of a road near the south end of the wetland (previously the middle of the wetland). W11 appears to be much drier given development of much of its eastern catchment area.
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	1999-07-20	AS5085_286	1:20,000	Sum	W-A(IV)	N	W	332.9	W	Y	W11 is distinctly visible and appears wetter than in 1984. A large open water area is evident in central and southern portions of W11
W11	NE 13-23-2-W5, NW 18-23-1-W5, SE 37-46-4-W5	2005-05-29	AS5321B_64	1:20,000	Spr	W-A(IV)	W	W	83.87	W	Y	W11 is clearly evident, but drier than in 1999.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	1926-05-28	CA185_94	n/a	Spr	W-A(IV)	n/a	n/a	n/a	W	Y	Same wetland basin as W11.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	1950-05-12	AS0169_138	1:40,000	Spr	W-A(IV)	n/a	n/a	n/a	W	Y	Same wetland basin as W11.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	1962-09-19	AS831_32	1:31,680	Fall	M-G(III)	D	N	208.33	W	Y	Same wetland basin as W11.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	1974-06-12	AS1316_48	1:31,680	Spr	W-A(IV)	D	N	66.39	W	Y	Same wetland basin as W11.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	1984-08-16	AS3085_267	1:20,000	Sum	M-G(III)	N	N	118.51	DV	N	W12 is difficult to discern, and a north-south trail or small road runs through the wetland.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	1999-07-20	AS5085_286	1:20,000	Sum	M-G(III)	N	W	332.9	DV	N	W12 is more visible than in 1984 image. . A distinct drainage channel that is likely dewatering W12 runs from W12 to W11.
W12	NW 18-23-1-W5, SE 13-23-2-W5, SW 18-23-1-W5	2005-05-29	AS5321B_64	1:20,000	Spr	M-G(III)	W	W	83.87	DV	N	W12 is visible but appears drier than in 1999. W12 is dominated by graminoid vegetation with some shrub establishment at the south end of the wetland, and the drainage ditch connecting it to W11 is drier and less prominent.
W13	NW 31-22-1-W5	1920	CA186_99	n/a	n/a	M-G(II)	n/a	n/a	n/a	DVI	N	W13 appears as an isolated and faint basin in 1920.
W13	NW 31-22-1-W5	1949-06-14	AS0169_138	1:40,000	Spr	n/a	n/a	n/a	n/a	DVI	N	W13 is not visible in the 1949 image.
W13	NW 31-22-1-W5	1966-08-09	AS0954_168	1:31,680	Sum	M-G(III)	N	N	130.54	DV	N	W13 is well defined in the 1966 image with an aggregate pit evident west of the wetland.
W13	NW 31-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(III)	N	N	54.09	DV	N	W13 did not change appreciably in appearance between 1966 and 1977. No changes to the surrounding land use are apparent in the immediate vicinity of the wetland.
W13	NW 31-22-1-W5	1982-09-30	AS2582_154	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W13 did not change appreciably in appearance between 1977 and 1982. No changes to the surrounding land use are apparent in the immediate vicinity of the wetland.
W13	NW 31-22-1-W5	1998-07-17	AS4991_115	1:20,000	Sum	M-G(IV)	W	N	408.27	W	Y	W13 appears wetter than in previous decades.
W13	NW 31-22-1-W5	2008-05-31	AS5436B_83	1:20,000	Spr	M-G(III)	W	W	567.06	DV	N	The road to the north of wetlands W13 and W14, now known as Fish Creek Blvd, has been expanded and housing subdivisions have been built north and east of the wetlands. The area south of the road appears wetter than in previous decades, and wetland hydrology might have been affected by the development of the road and residential area.
W14	NW 31-22-1-W5	1920	CA186_99	n/a	n/a	M-G(III)	n/a	n/a	n/a	DV	N	W14 is evident with a distinctly wetter area in the centre.
W14	NW 31-22-1-W5	1950-05-12	AS0169_5016	1:40,000	Spr	W-A(IV)	n/a	n/a	n/a	W	Y	W14 is clearly visible with a well-defined open water component. Most of the landscape surrounding W14 is under some form of annual cultivation and the road to the north of the wetland appears better developed than in the 1920 image.
W14	NW 31-22-1-W5	1966-08-09	AS0954_168	1:31,680	Sum	W-A(IV)	N	N	130.54	W	Y	W14 is well defined in the 1966 image, although it appears drier than in previous decades.
W14	NW 31-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(III)	N	N	54.09	DV	N	W14 appears drier than in 1966. Wetland basin is dominated by graminoid vegetation.
W14	NW 31-22-1-W5	1982-09-30	AS2582_154	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W14 is similar in appearance to the previous decade.
W14	NW 31-22-1-W5	1998-07-17	AS4991_115	1:20,000	Sum	M-G(IV)	W	N	408.27	W	Y	W14 appears wetter than in 1982 image.
W14	NW 31-22-1-W5	2008-05-31	AS5436B_83	1:20,000	Spr	M-G(IV)	W	W	567.06	W	Y	W14 appears wetter than in 1998 image with a large wet meadow plant zone visible south of the wettest part of the wetland.
W15	SE 31-22-1-W5, SW 31-22-1-W5	1920	CA186_15	n/a	n/a	M-G(II)	n/a	n/a	n/a	DVI	N	W15 and W16 occur as a single basin in 1920. The wetland is surrounded by natural vegetation and some land that has been cleared for agriculture.
W15	SE 31-22-1-W5, SW 31-22-1-W5	1950-05-12	AS0169_5016	1:40,000	Spr	M-G(IV)	n/a	n/a	n/a	W	Y	W15 and W16 appear as a single basin, and watercourse WC02 is visible at the south end of the wetland.
W15	SE 31-22-1-W5, SW 31-22-1-W5	1966-08-09	AS0954_168	1:31,680	Sum	M-G(II)	N	N	130.54	DVI	N	W15 and W16 appear as a single basin that is not well defined, largely dry, and primarily surrounded by native pasture. Disturbance is evident within the wetland at the north end, and land clearing for agriculture is apparent outside the wetland to the north.
W15	SE 31-22-1-W5, SW 31-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(III)	N	N	54.09	DV	N	W15 and W16 appear as a single basin. The north end of the wetland has been heavily impacted by agricultural and ditching activities, while the south end of the wetland is naturally vegetated and well defined.
W15	SE 31-22-1-W5, SW 31-22-1-W5	1982-09-30	AS2582_154	1:25,000	Fall	M-G(II)	N	D	242.45	DVI	N	Aggregate extraction has been carried out in the northern half of the wetland, resulting in separation of wetlands W15 and W16. Wetland W15 appears highly disturbed and drier, likely as a consequence of upstream water impoundment.
W15	SE 31-22-1-W5, SW 31-22-1-W5	1998-07-17	AS4991_115	1:20,000	Sum	W-A(IV)	W	N	408.27	W	Y	W15 and W16 appear as distinct basins in 1998. W15 is much wetter than W16, and appears to have expanded and flooded part of the aggregate extraction area.
W15	SE 31-22-1-W5, SW 31-22-1-W5	2008-05-31	AS5436B_83	1:20,000	Spr	W-A(IV)	W	W	567.06	Y	Y	W15 appears drier and smaller than in 1998.
W16	NE 30-22-1-W5	1920	CA186_15	n/a	n/a	M-G(II)	n/a	n/a	n/a	DVI	N	Same wetland basin as W15.
W16	NE 30-22-1-W5	1950-05-12	AS0169_5016	1:40,000	Spr	M-G(IV)	n/a	n/a	n/a	W	Y	Same wetland basin as W15.
W16	NE 30-22-1-W5	1966-08-09	AS0954_168	1:31,680	Sum	M-G(II)	N	N	130.54	DVI	N	Same wetland basin as W15.
W16	NE 30-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(III)	N	N	54.09	DV	N	Same wetland basin as W15.
W16	NE 30-22-1-W5	1982-09-30	AS2582_152	1:25,000	Fall	M-G(II)	N	D	242.45	DV	N	Northern half of wetland has been heavily impacted, resulting in separation of wetlands W15 and W16. W16 appears drier than 1977 image and is dominated by graminoid vegetation.
W16	NE 30-22-1-W5	1998-07-17	AS4991_115	1:20,000	Sum	M-G(II)	W	N	408.27	DV	N	W16 is indistinct
W16	NE 30-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	M-G(II)	W	W	567.06	DV	N	W16 appears similar than in 1998 image.
W19	SE 30-22-1-W5	1920	CA184_11	n/a	n/a	M-G(II)	n/a	n/a	n/a	DV	N	W19 is clearly visible and surrounded by native grass and shrubby vegetation.
W19	SE 30-22-1-W5	1951-06-14	AS0169_14	1:40,000	Spr	M-G(III)	n/a	n/a	n/a	DV	N	W19 is clearly visible in 1949. Shrubby vegetation adjacent to W19 was cleared between 1920 and 1949, and evidence of the clearing activity is apparent as lighter coloured lines around W19.
W19	SE 30-22-1-W5	1966-08-09	AS0954_133	1:31,680	Sum	M-G(II)	N	N	130.54	DV	N	W19 is visible and persistent in the 1966 image. The land around the wetland appears to be used for agriculture.
W19	SE 30-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(II)	N	N	54.09	DVI	N	W19 did not change appreciably in appearance between 1977 and previous decades.
W19	SE 30-22-1-W5	1982-09-30	AS2582_152	1:25,000	Fall	n/a	N	D	242.45	DVI	N	W19 is not visible in the 1982 image
W19	SE 30-22-1-W5	1998-07-17	AS4991_85	1:20,000	Sum	n/a	W	N	408.27	DVI	N	W19 is not visible in the 1998 image.

Wetland ID	Legal Land Description	Photo Date mm/dd/year	Photo ID	Resolution	Season	AWCS Wetland Class	Precipitation Year	Precipiration Month (W, D, N)	Total Precipitation (mm) two weeks prior to photo date	Open Water Visible or Consistent Wetland Vegetation Signature	Assessment of Permanence	Photo Notes (Changes)
W19	SE 30-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	M-G(II)	W	W	567.06	DVI	N	W19 is faint and appears smalled and drier than in previous years. A housing subdivision has been built northeast of W19, but does not appear to have had direct impacts on W19.
W20	SW 29-22-1-W5	1920	CA184_11	n/a	n/a	M-G(III)	n/a	n/a	n/a	DV	N	W20 is visible and surrounded surrounded by cultivated land.
W20	SW 29-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	M-G(III)	n/a	n/a	n/a	DV	N	No changes are visible in W20 between 1920 and 1949. the land around the wetland continues to be used for agriculture.
W20	SW 29-22-1-W5	1966-08-09	AS0954_133	1:31,680	Sum	M-G(III)	N	N	130.54	DV	N	Shrubby vegetation is evident in W20, and the wetland looks the same as in previous decades.
W20	SW 29-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(III)	N	N	54.09	DV	N	W20 did not change appreciably in appearance between 1977 and previous decades.
W20	SW 29-22-1-W5	1982-09-30	AS2582_152	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W20 is evident in 1982 image. Shrubby vegetation encroachment appears evident in the central portion of the wetland.
W20	SW 29-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	M-G(III)	W	N	408.27	DV	N	A major east-west road (now known as Highway 22X or Stoney Trail SE) has been constructed to the north of W20, and might have impacted the northern end of W20.
W20	SW 29-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	M-G(III)	W	W	567.06	DV	N	W20 is visible in 2008 and dominated by graminoid vegetation with shrubby cover to the west of the wetland.
W21	NW-20-22-1-W5	1920	CA184_11	n/a	n/a	M-G(III)	n/a	n/a	n/a	DV	N	W21 is visible and surrounded surrounded by cultivated land. Road immediately adjacent to W21 likely altered wetland hydrology when it was constructed.
W21	NW-20-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	M-G(III)	n/a	n/a	n/a	DV	N	No changes are visible in W21 between 1920 and 1949. The land around the wetland continues to be used for agriculture.
W21	NW-20-22-1-W5	1966-08-09	AS0954_133	1:31,680	Sum	W-A(IV)	N	N	130.54	W	Y	W21 is wetter than in previous years, and extends across to the north side of the road in the 1966 image.
W21	NW-20-22-1-W5	1977-10-11	AS2980_224	1:25,000	Fall	M-G(III)	N	N	54.09	DV	N	W21 is visible only on the south side of the road in 1977; agricultural activity on the north side of the road passes through the area delineated as W21 in the 1966 image.
W21	NW-20-22-1-W5	1982-09-30	AS2582_152	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W21 is clearly visible in 1982 with a wetter area in the central portion of the baisin.
W21	NW-20-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	M-G(IV)	W	N	408.27	W	Y	W21 is visible with a wetter are in the central portion of the basin,
W21	NW-20-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	M-G(III)	W	W	567.06	DV	N	W21 appears drier than in 1998 and is dominated by graminoid vegetation.
W22	SW-28-22-1-W5	1920	CA184_8	n/a	n/a	W-A(IV)	n/a	n/a	n/a	W	Y	W22 appears as a linear wetland more than 1 km long that is dominated by graminoid vegetation in 1920. While anthropogenic activity is evident in places around the wetland (e.g., roads/tracks and buildings), there do not appear to have been any significant direct impacts to this segment of W22 prior to 1920.
W22	SW-28-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	W-A(IV)	n/a	n/a	n/a	W	Y	W22 is clearly visible in the 1949 image, and it appears wetter than in 1920. Anthropogenic drainage ditches are visible, particularly along the western side of the wetland, and these ditches are likely facilitating drainage of surrounding agricultural land by consolidating water in the wetland.
W22	SW-28-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	M-G(III)	N	N	130.54	DV	N	W22 appears drier and less distinct in the 1966 image than in the 1949 image, with no open water visible. The wetland is dominated by graminoid vegetation, and an east-west oil lease access road has been built through the wetland.
W22	SW-28-22-1-W5	1977-10-11	AS2980_222	1:25,000	Fall	W-A(IV)	N	N	54.09	W	Y	W22 is better defined in 1977 than it was in 1966, with wetter patches near the centre and south end of the wetland. Anthropogenic activity is evident in places around the periphery of the wetland. The north end of the wetland appears to have been drained and converted to pasture, and a dugout has been created near the northwest corner of the wetland.
W22	SW-28-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	W-A(IV)	N	D	242.45	W	Y	W22 appears wetter in 1982 than in the previous two decades, and shrubby vegetation has established adjacent to the north-south road that crosses the wetland.
W22	SW-28-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	W-A(IV)	W	N	408.27	W	Y	The development of a housing subdivision and major east-west road (now known as Highway 22X or Stoney Trail SE) to the north has truncated W22 so that only a relatively small remnant remains.
W22	SW-28-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	W-A(IV)	W	W	567.06	W	Y	W22 appears wetter in 2008 than it appeared in 1998.
W23	NW-21-22-1-W5	1920	CA184_8	n/a	n/a	W-A(IV)	n/a	n/a	n/a	W	Y	W22 and W23 would have been one contiguous wetland prior to development of the east-west road that separates them in the 1920 image. W23 appears wetter than the southern portion of W22. A north-south road runs along the west side of W23, and the land to the east of the wetland has been cleared for agriculture.
W23	NW-21-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	W-A(IV)	n/a	n/a	n/a	W	Y	W23 appears wetter in the 1949 image than the 1920 image.
W23	NW-21-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	M-G(III)	N	N	130.54	DV	N	W23 appears less distinct in the 1966 image than in the 1949 image, and dominated by graminoid vegetation with no open water visible.
W23	NW-21-22-1-W5	1977-11-01	AS2980_224	1:25,000	Spr	M-G(III)	N	N	90.75	DV	N	W23 is well defined in 1977, and appears to be dominated by graminoid vegetation.
W23	NW-21-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W23 does not appear to have changed significantly in extent since previous decades, however, it appears to be experiencing a long-term reduction in water budget
W23	NW-21-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	M-G(III)	W	N	408.27	DV	N	W23 has not changed significantly since previous decades
W23	NW-21-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	W-A(IV)	W	W	567.06	W	Y	A housing subdivision is under construction adjacent to W23 and W25 on land that was used for agriculture in past decades. W23 shows evidence of open water, which could be due to a combination of higher than average precipitation in 2008 and changes to wetland hydrology associated with residential development on the surrounding land. Linear drainage ditches are visible at the south end of W23.
W24	SE 28-22-1-W5, SW 28-22-1-W5	1920	CA184_8	n/a	n/a	M-G(II)	n/a	n/a	n/a	DVI	N	W24 is faint but visible in 1920. Appears to be dominated by graminoid vegetation, and is surrounded by agricultural land.
W24	SE 28-22-1-W5, SW 28-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	M-G(II)	n/a	n/a	n/a	DVI	N	W24 has a similar appearance in 1920 and 1949.
W24	SE 28-22-1-W5, SW 28-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	M-G(II)	N	N	130.54	DVI	N	W24 appears less distinct in the 1966 image.
W24	SE 28-22-1-W5, SW 28-22-1-W5	1977-10-11	AS2980_222	1:25,000	Fall	M-G(II)	N	N	54.09	DVI	N	W24 is indistinct, as it was in previous years, and appears to be cultivated in this image.
W24	SE 28-22-1-W5, SW 28-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	M-G(II)	N	D	242.45	DVI	N	W24 has a similar appearance to that observed in previous decades, and is difficult to discern.
W24	SE 28-22-1-W5, SW 28-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	M-G(II)	W	N	408.27	DV	N	W24 appears larger than in previous decades, which might be related to the changes in hydrology associated with the construction of road segments on both sides of the wetland.
W24	SE 28-22-1-W5, SW 28-22-1-W5	2008-05-31	AS5436B_68	1:20,000	Spr	M-G(II)	W	W	567.06	DV	N	W24 is similar in appearance than in 1998 and is dominated by graminoid vegetation.
W27	SW 27-22-1-W5	1920	CA184_6	n/a	n/a	W-A(V)	n/a	n/a	n/a	W	Y	W27 is clearly visible in 1920 photo with a significant open water component.
W27	SW 27-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	W-A(V)	n/a	n/a	n/a	W	Y	W27 appears wetter in 1949 than the 1920 image with open water visible almost to the edge of the basin.
W27	SW 27-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	W-A(V)	N	N	130.54	W	Y	W27 appears to cover more area in the 1966 image. Open water visible.
W27	SW 27-22-1-W5	1977-10-11	AS2980_222	1:25,000	Spr	W-A(IV)	N	N	90.75	W	Y	Water level in wetland W27 appears to be drawn down compared to previous decades.
W27	SW 27-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	M-G(II)	N	D	242.45	DV	N	W27 appears to have been largely drained, and a drainage ditch is evident near the north end of the remaining wetland area.
W27	SW 27-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	W-A(IV)	W	N	408.27	W	Y	A major interchange joining Macleod Trail SE (which runs north-south) and Highway 22X (which runs east-west) was established between 1982 and 1998, and it appears to have impacted all adjacent wetlands. An anthropogenic water feature has replaced most of W27, leaving only a linear remnant of the wetland along the rail line and road to the south.
W27	SW 27-22-1-W5	2008-05-31	AS5436B_70	1:20,000	Spr	M-G(III)	W	W	567.06	DV	N	W27 does not appear to have changed since the previous decade.

Wetland ID	Legal Land Description	Photo Date mm/dd/year	Photo ID	Resolution	Season	AWCS Wetland Class	Precipitation Year	Precipiration Month (W, D, N)	Total Precipitation (mm) two weeks prior to photo date	Open Water Visible or Consistent Wetland Vegetation Signature	Assessment of Permanence	Photo Notes (Changes)
W26	SW 27-22-1-W5	1920	CA184_6	n/a	n/a	W-A(V)	n/a	n/a	n/a	W	Y	W26 is clearly visible in 1920 photo with a significant open water component. The rail line that runs through W27 has already been established in 1920 as has the east-west road that separates W26 and W27 from W29 and W30 and W31.
W26	SW 27-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	W-A(V)	n/a	n/a	n/a	W	Y	W26 appears wetter in 1949 than the 1920 image with open water visible almost to the edge of the basin.
W26	SW 27-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	W-A(V)	N	N	130.54	W	Y	W26 appears to cover more area in the 1966 image. Open water visible.
W26	SW 27-22-1-W5	1977-10-11	AS2980_222	1:25,000	Spr	W-A(IV)	N	N	90.75	W	Y	W26 appears drawn down. Linear features and possibly drainage ditches, are visible in the northwest corner of W26
W26	SW 27-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W26 extends farther north than in 1977, and it appears drier than in previous decades. Agricultural activity is evident along the western edge of W26.
W26	SW 27-22-1-W5	1998-07-17	AS4991_87	1:20,000	Sum	W-A(IV)	W	N	408.27	W	Y	W26 has been truncated by a housing development at its north end, and the southern portion of the wetland appears wetter than in 1982.
W26	SW 27-22-1-W5	2008-05-31	AS5436B_70	1:20,000	Spr	W-A(IV)	W	W	567.06	W	Y	The northern portion of wetland W26 has been lost to residential development, but the southern portion of W26 appears intact.
W30	NW 22-22-1-W5	1920	CA184_6	n/a	n/a	M-G(II)	n/a	n/a	n/a	DV	N	W29 and W30 occur as a single basin in 1920. The southern portion of W29 & W30 appear dominated by graminoid vegetation, and adjacent land at the south end of the wetland has been impacted by agriculture.
W30	NW 22-22-1-W5	1951-06-14	AS0169_15	1:40,000	Spr	M-G(III)	n/a	n/a	n/a	DV	N	W29 and W30 again appear as a single basin in 1949 and the southern portion of the wetland appears wetter than in 1920 image.
W30	NW 22-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	M-G(IV)	N	N	130.54	W	Y	While wetland W30 appears wetter in 1966 than in 1949, it does not extend as far to the south as it did in the 1949 image.
W30	NW 22-22-1-W5	1976-05-01	AS3014_27	1:31,680	Spr	M-G(III)	N	N	90.75	DV	N	W29 and W30 appear as a single basin that is larger than in previous years, and anthropogenic activity is evident near the north end of the wetland.
W30	NW 22-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	M-G(III)	N	D	242.45	DV	N	W30 appears as a basin distinct from W29 and drier than in 1977.
W30	NW 22-22-1-W5	1998-07-17	AS4991_89	1:20,000	Sum	S-S(III)	W	N	408.27	DV	N	W30 appears distinct in 1998, and shrubby vegetation is establishing both within and around the wetland.
W30	NW 22-22-1-W5	2008-05-31	AS5436B_70	1:20,000	Spr	S-S(III)	W	W	567.06	DV	N	W30 has persisted as a linear remnant of W31 on the west side of the rail line. W30 is now dominated by shrubby vegetation.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	1920	CA184_6	n/a	n/a	W-A(V)	n/a	n/a	n/a	W	Y	W31 is clearly visible with a significant open water component in the central portion of the wetland basin. Disturbance is evident at the south end of the image.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	1950-04-30	AS0169_16	1:40,000	Spr	W-A(V)	n/a	n/a	n/a	W	Y	The central portion of W31 appears wetter in the 1949 image than in the 1920 image, with open water extending down the centre of the wetland to the south end.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	1966-08-09	AS0954_135	1:31,680	Sum	W-A(V)	N	N	130.54	W	Y	W31 is clearly visible with a large component of open water. Ditch work extending south is visible in the open water portion of W31, which suggests anthropogenic drainage activity in the wetland.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	1976-05-01	AS3014_27	1:31,680	Spr	W-A(V)	N	N	90.75	W	Y	The north end of W31 has a significant open water component that might be the result of water consolidation efforts via culverts to the north.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	1982-09-30	AS2582_128	1:25,000	Fall	W-A(IV)	N	D	242.45	W	Y	W31 appears drier in the 1982 image and has significantly less open water than it has in any previous images (the 1920 image is closest and it shows slightly more open water). A linear feature, possibly a drain, is visible near the centre of the wetland.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	1998-07-17	AS4991_89	1:20,000	Sum	W-A(IV)	W	N	408.27	W	Y	The central portion of W31 appears wetter than in the previous decade.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	2008-05-31	AS5436B_70	1:20,000	Spr	W-A(V)	W	W	567.06	W	Y	The southern portion of W31 is wetter than in some previous decades. Aside from the establishment of the City of Calgary's Roads Maintenance Depot along the east side of the wetland, W31 appears largely intact. There is evidence of a drainage ditch entering W31 from an agricultural area to the west, and a small drainage channel is apparent at the farthest southern point of W31. These water inputs might have contributed to the high water levels visible in W31 in the 2008 image.
W31	-22-1-W5, NW 14-22-1-W5, SE 15-22-1-W5, SW 14-22	2008-09-25	AS5457B_150	1:20,000	Fall	W-A(V)	W	W	130.48	W	Y	W31 appears slightly drier than in the spring images, however, appears relatively the same as the previous photograph.
W32	SE 15-22-1-W5	1905-04-03	CA184_6	n/a	n/a	M-G-III	n/a	n/a	n/a	W	Y	W32 is clearly visible with a significant open water component in the central portion of the wetland basin.
W32	SE 15-22-1-W5	1950-04-30	AS0169_16	1:40,000	Spr	M-G-III	n/a	n/a	n/a	W	Y	W32 is clearly visible with a significant open water component in the central portion of the wetland basin.
W32	SE 15-22-1-W5	1966-08-09	AS0954_135	1:31,680	Sum	M-G-III	N	N	130.54	DV	Y	W32 is clearly visible with no open water component visible. Some disturbance adjacent to the southwest edge from road development.
W32	SE 15-22-1-W5	1976-05-01	AS3014_27	1:31,680	Spr	M-G-II	N	N	90.75	DV	N	W32 is clearly visible with no open water component visible. Some disturbance adjacent to the southwest edge from road development.
W32	SE 15-22-1-W5	1982-09-30	AS2582_128	1:25,000	Fall	M-G-II	N	D	242.45	DV	N	W32 is clearly visible with no open water component visible. Some disturbance adjacent to the southwest edge from road and on the east from agricultural activity.
W32	SE 15-22-1-W5	1998-07-17	AS4991_89	1:20,000	Sum	M-G-II	W	N	408.27	DVI	N	W32 does not have clearly defined boundaries. Agricultural activity on the east and north has increased and expanded.
W32	SE 15-22-1-W5	2008-05-31	AS5436B_70	1:20,000	Spr	M-G-II	W	W	567.06	DVI	N	W32 does not have clearly defined boundaries. Urban development has established on the east of the wetland formerly agricultural land use.

APPENDIX G

AWCS Definitions

Wetland classes, forms and types in the Alberta Wetland Classification System. Wetland classification codes for mapping uses are in brackets.

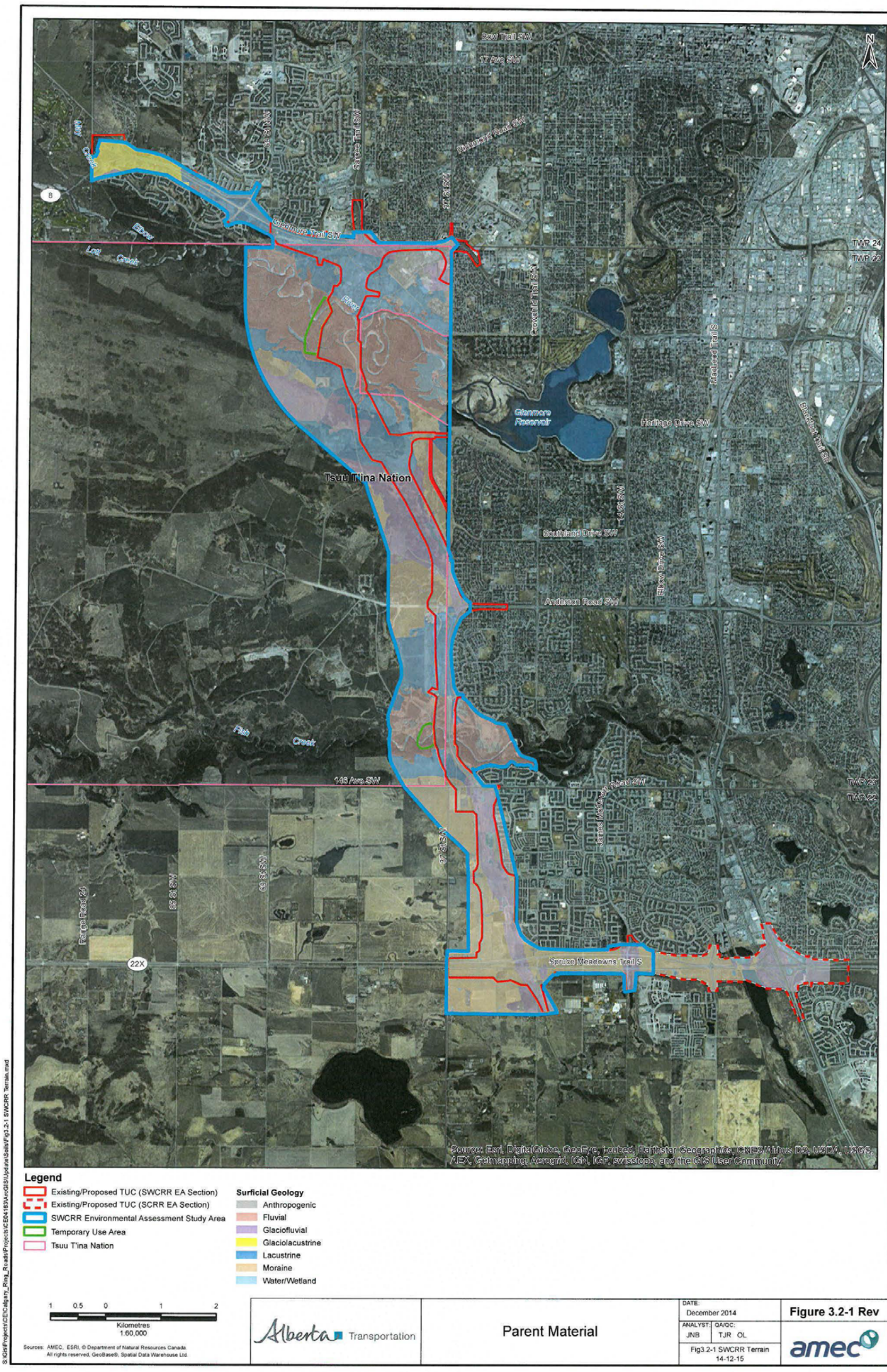
Class	Form	Types		
		Salinity	Water permanence[1]	Acidity-alkalinity
Bog [B]	Wooded, coniferous [Wc] Shrubby [S] Graminoid [G]	Freshwater [f]	-	Acidic [a]
Fen [F]	Wooded, coniferous [Wc] Shrubby [S] Graminoid [G]	Freshwater [f]	-	Poor [p]
		Freshwater [f]	-	Moderate-rich [mr]
		Freshwater [f] to slightly brackish [sb]	-	Extreme-rich [er]
Marsh [M]	Graminoid [G]	Freshwater [f] to slightly brackish [sb]	Temporary [II]	-
		Freshwater [f] to moderately brackish [mb]	Seasonal [III]	-
		Freshwater [f] to brackish [b]	Semi-permanent [IV]	-
Shallow Open Water [W]	Submersed and/or floating aquatic vegetation [A] or bare [B]	Freshwater [f] to moderately brackish [mb]	Seasonal [III]	-
		Freshwater [f] to sub-saline [ss]	Semi-permanent [IV]	-
		Slightly brackish [sb] to sub-saline [ss]	Permanent [V]	-
	[A]	Saline [s]	Intermittent [VI]	-
Swamp [S]	Wooded, coniferous [Wc] Wooded, mixedwood [Wm] Wooded, deciduous [Wd] Shrubby [S]	Freshwater [f] to slightly brackish [sb] [2]	Temporary [II] [2]	-
		Freshwater [f] to slightly brackish [sb] [2]	Seasonal [III] [2]	-
		moderately brackish [mb) to sub-saline [ss] [2]	Seasonal [III] [2]	-

[1] Roman numerals are equivalent to wetland classes by Stewart and Kantrud (1971)

[2] Swamp types are not applicable to wooded swamps due to a lack of available information

APPENDIX H

Soils and Terrain Figures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Richmond Road SW
Sarcee Trail SW
37 St SW
Glenmore Trail SW
Elbow
Lott Creek
May Creek
8
Rocky
Crowchild Trail SW
Macleod Trail S
Glenmore Reservoir
Heritage Drive SW
TWP 24
TWP 23
N
Tsuu T'ina Nation
14 St SW
Southland Drive SW
Elbow Drive SW
Anderson Road SW
Fish Creek
146 Ave SW
James Mckevitt Road SW
TWP 23
TWP 22
37 St SW
69 St SW
85 St SW
Range Road 24
22X
Spruce Meadows Trail S
Source: Esri, DigitalGlobe, GeoEye, Foubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Legend
Existing/Proposed TUC (SWCRR EA Section)
Existing/Proposed TUC (SCRR EA Section)
SWCRR Environmental Assessment Study Area
Temporary Use Area
Tsuu T'ina Nation
Surficial Geology
Anthropogenic
Fluvial
Glaciofluvial
Glaciolacustrine
Lacustrine
Moraine
Water/Wetland
1 0.5 0 1 2
Kilometres
1:60,000
Sources: AMEC, ESRI, © Department of Natural Resources Canada. All rights reserved, GeoBase®, Spatial Data Warehouse Ltd.
Alberta Transportation
Parent Material
DATE: December 2014
ANALYST: JNB
QA/QC: TJR OL
Fig3.2-1 SWCRR Terrain 14-12-15
Figure 3.2-1 Rev
amec
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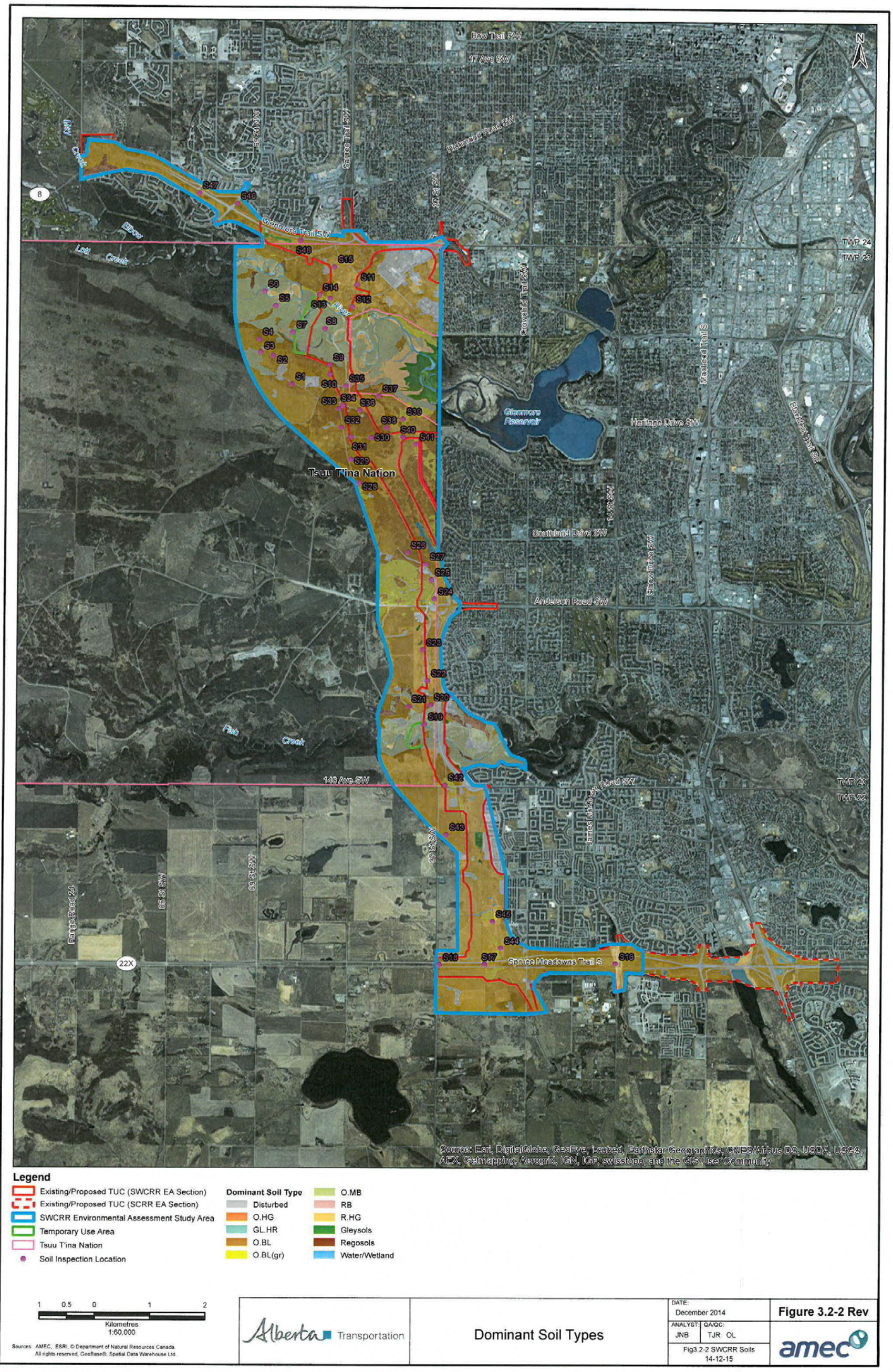

Legend

- Existing/Proposed TUC (SWCRR EA Section)
- Existing/Proposed TUC (SCRR EA Section)
- SWCRR Environmental Assessment Study Area
- Temporary Use Area
- Tsuu T'ina Nation
- Soil Inspection Location

Dominant Soil Type

- Disturbed
- O.HG
- GL.HR
- O.BL
- O.BL(gr)
- O.MB
- RB
- R.HG
- Gleysols
- Regosols
- Water/Wetland

1 0.5 0 1 2
Kilometres
1:60,000

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Alberta Transportation

Dominant Soil Types

DATE: December 2014
ANALYST: JNB | QA/QC: TJR OL
Fig3.2-2 SWCRR Soils 14-12-15

Figure 3.2-2 Rev

amec

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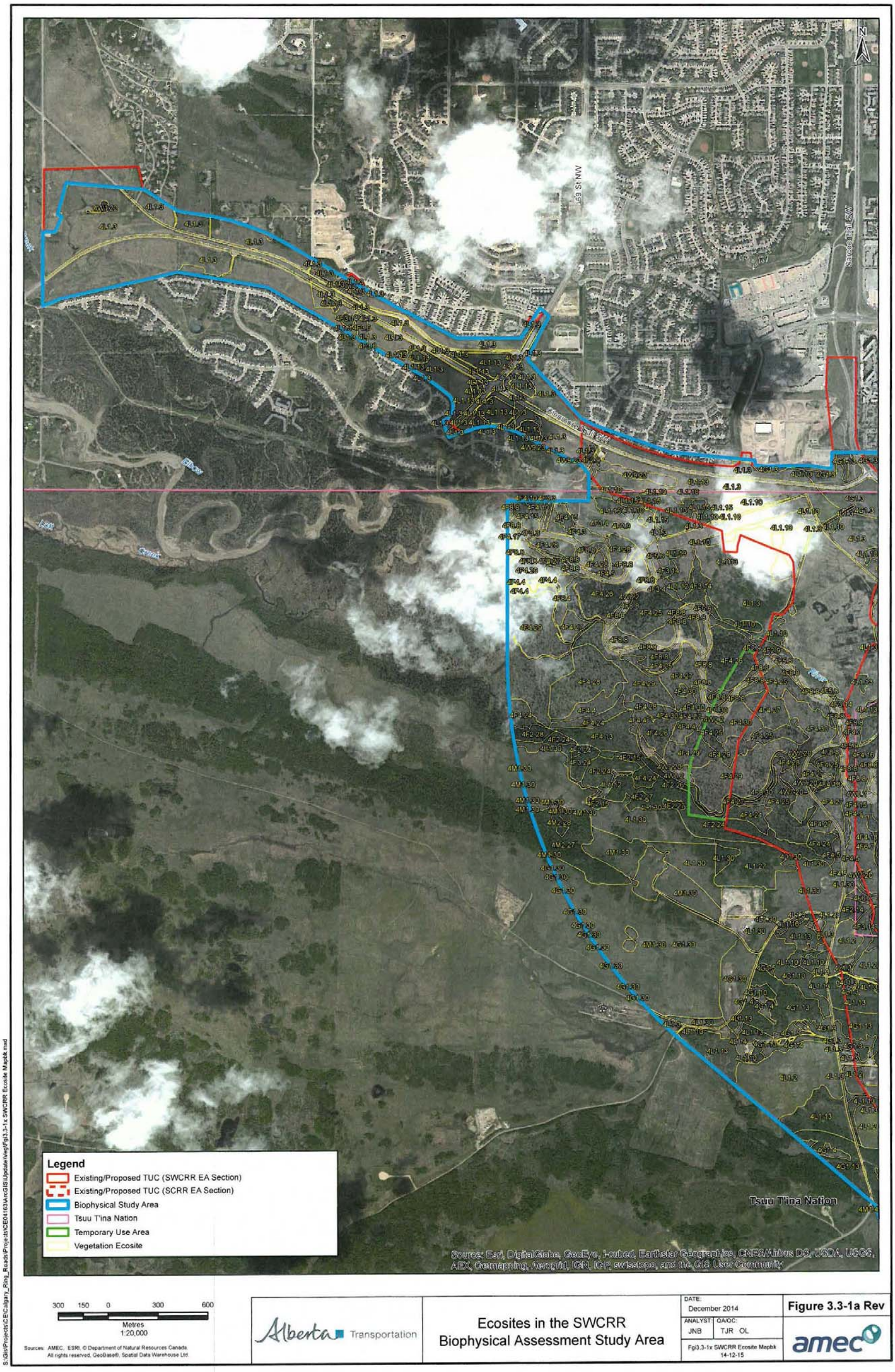
APPENDIX I

Vegetation and Land Cover Figures

Vegetation Cover Types Mapped in the SWCRR Study Site

Code	Land Cover Description	Symbol
1	Anthropogenic	A
2	Cropland	C
3	Domestic grasses	DG
4	Native grassland	NG
5	Low shrub-terrace/plain	LS-t/p
6	Low shrub-slope	LS-s
7	Tall shrub-deltaic	TS-d
8	Tall shrub-streamside	TS-s
9	Tall shrub-riverbank	TS-r
10	Tall shrub-terrace/plain	TS-t/p
11	Burnt-willow	B-w
12	Burnt-poplar	B-p
13	Aspen forest-terrace/plain	Aw-t/p
14	Aspen forest-slope	Aw-s
15	Balsam poplar forest	Pb
16	Deciduous-mixedwood forest	Dm
17	Coniferous-mixedwood forest	Cm
18	White spruce forest	Sw
19	Wetland fluvial-shrubby	Wf-s
20	Wetland fluvial-beaked sedge-standing water	Wf-b
21	Fluvial mudflats	Fm
22	Wetland nonfluvial-shallow wetland	W-s
23	Wetland nonfluvial-Manmade	W-m
24	Cleared-closed deciduous forest	C-D/c
25	Cleared-closed mixedwood forest	C-M/c
26	Cleared-closed white spruce forest	C-Sw/c
27	Cleared-open deciduous forest	C-D/o
28	Cleared-open mixedwood forest	C-M/o
29	Cleared-open white spruce forest	C-Sw/o
30	Cleared-mixed shrubs	C-Ms


N
69 St NW
Sarcee Trail SW
Stoney Trail SW
Elbow
Elbow River
Tsuu T'ina Nation
Legend
Existing/Proposed TUC (SWCRR EA Section)
Existing/Proposed TUC (SCRR EA Section)
Biophysical Study Area
Tsuu T'ina Nation
Temporary Use Area
Vegetation Ecosite
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Metres
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Sources: AMEC, ESRI, © Department of Natural Resources Canada. All rights reserved, GeoBase®, Spatial Data Warehouse Ltd.
Alberta Transportation
Ecosites in the SWCRR
Biophysical Assessment Study Area
DATE: December 2014
ANALYST: JNB
QA/QC: TJR OL
Fgi3.3-1x SWCRR Ecosite Mapbk 14-12-15
Figure 3.3-1a Rev
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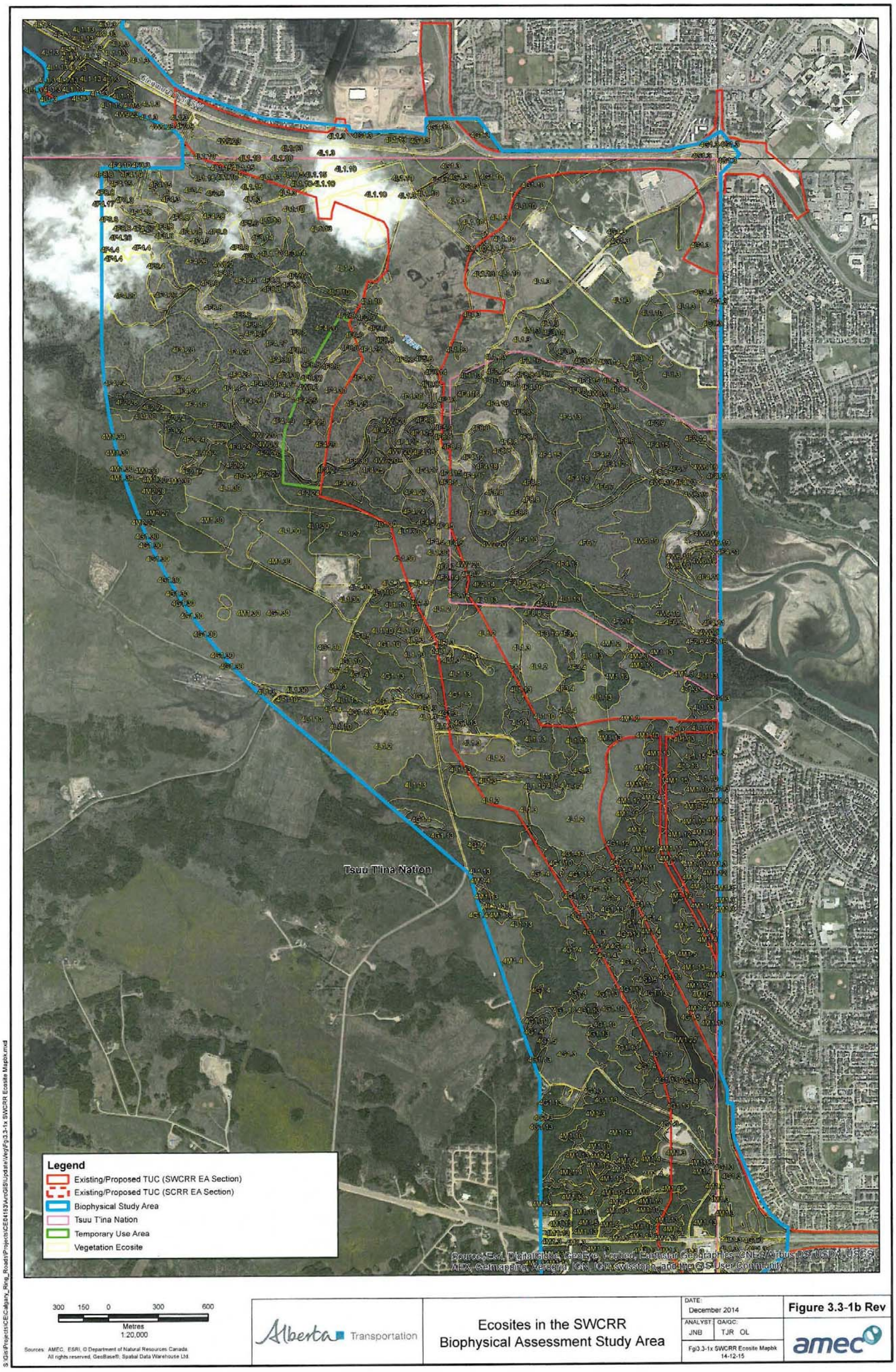
Tsuu T'ina Nation
Legend
Existing/Proposed TUC (SWCRR EA Section)
Existing/Proposed TUC (SCRR EA Section)
Biophysical Study Area
Tsuu T'ina Nation
Temporary Use Area
Vegetation Ecosite
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Sources: AMEC, ESRI, © Department of Natural Resources Canada. All rights reserved, GeoBase®, Spatial Data Warehouse Ltd.
Alberta Transportation
Ecosites in the SWCRR Biophysical Assessment Study Area
DATE: December 2014
ANALYST: JNB
QA/QC: TJR OL
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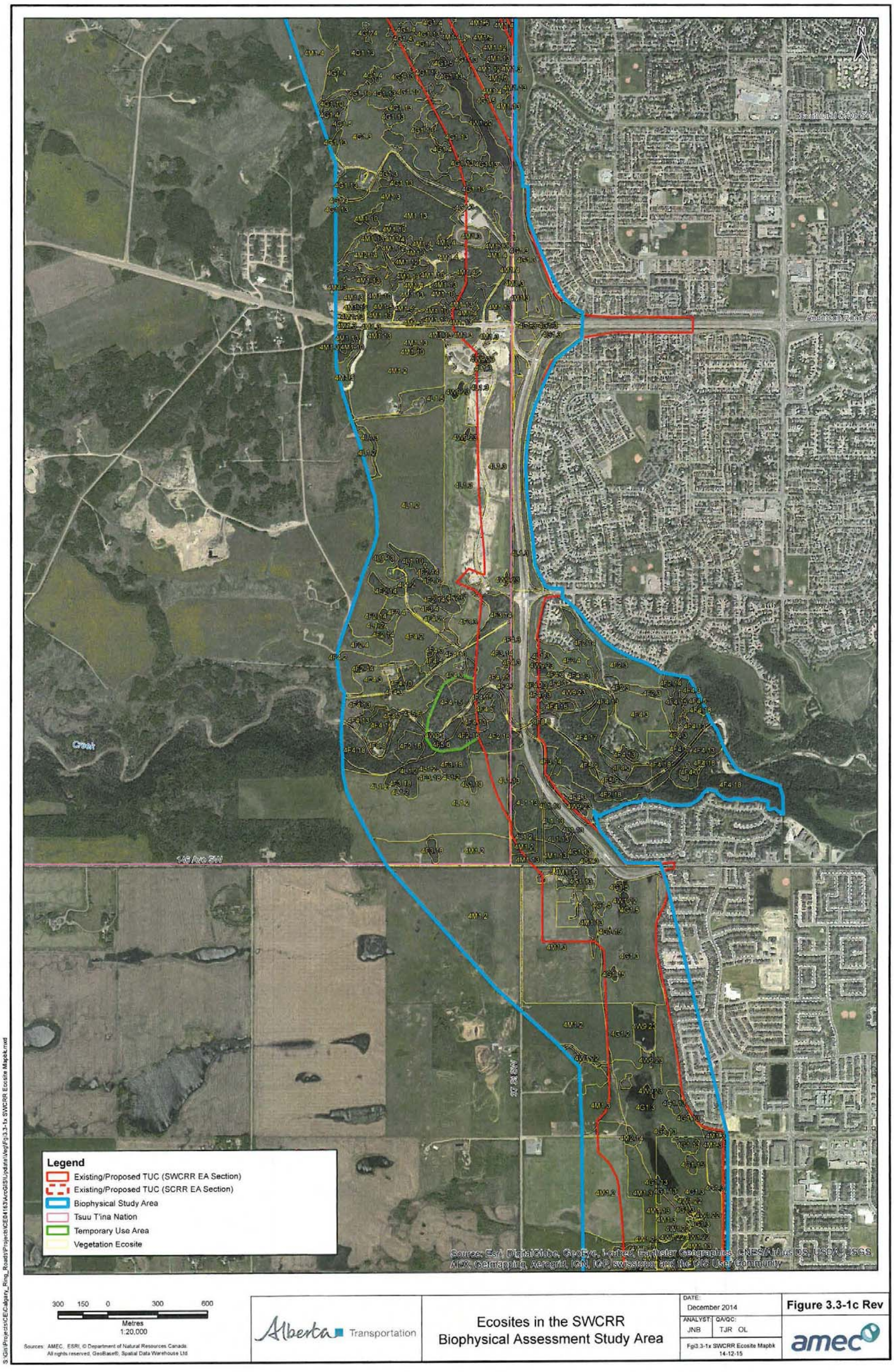
Scotland Drive SW
Anderson Road SW
14A Ave SW
27 St SW
Creek
Legend
Existing/Proposed TUC (SWCRR EA Section)
Existing/Proposed TUC (SCRR EA Section)
Biophysical Study Area
Tsuu T'ina Nation
Temporary Use Area
Vegetation Ecosite
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Sources: AMEC, ESRI, © Department of Natural Resources Canada. All rights reserved, GeoBase®, Spatial Data Warehouse Ltd.
Alberta Transportation
Ecosites in the SWCRR Biophysical Assessment Study Area
DATE: December 2014
ANALYST: JNB
QA/QC: TJR OL
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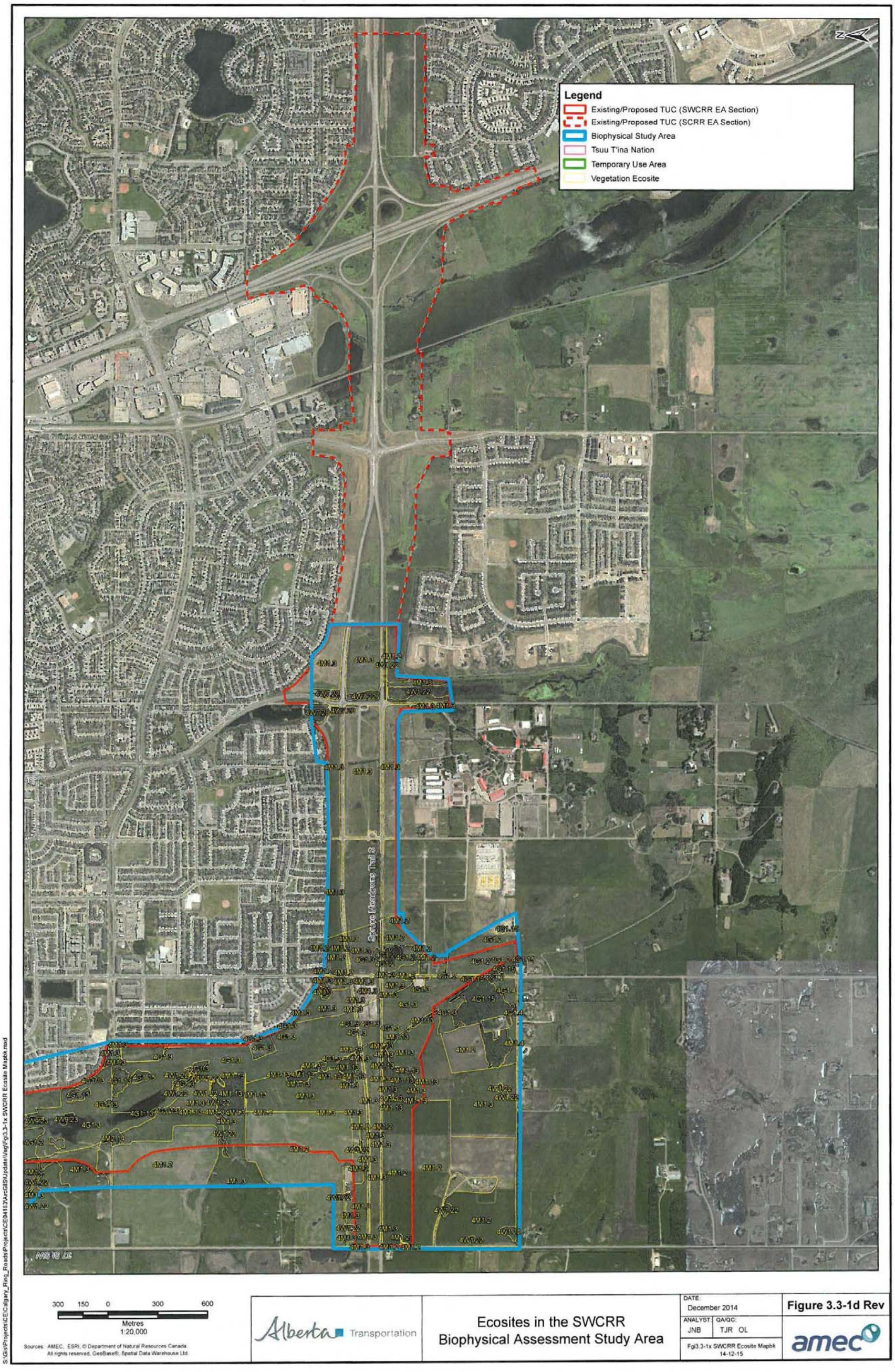
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Existing/Proposed TUC (SCRR EA Section)
Biophysical Study Area
Tsuu T'ina Nation
Temporary Use Area
Vegetation Ecosite
Sartige Meadows Trail S
300 150 0 300 600
Metres
1:20,000
Sources: AMEC, ESRI, © Department of Natural Resources Canada. All rights reserved, GeoBase®, Spatial Data Warehouse Ltd.
Alberta Transportation
Ecosites in the SWCRR Biophysical Assessment Study Area
DATE: December 2014
ANALYST: JNB
QA/QC: TJR OL
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Figure 3.3-1d Rev
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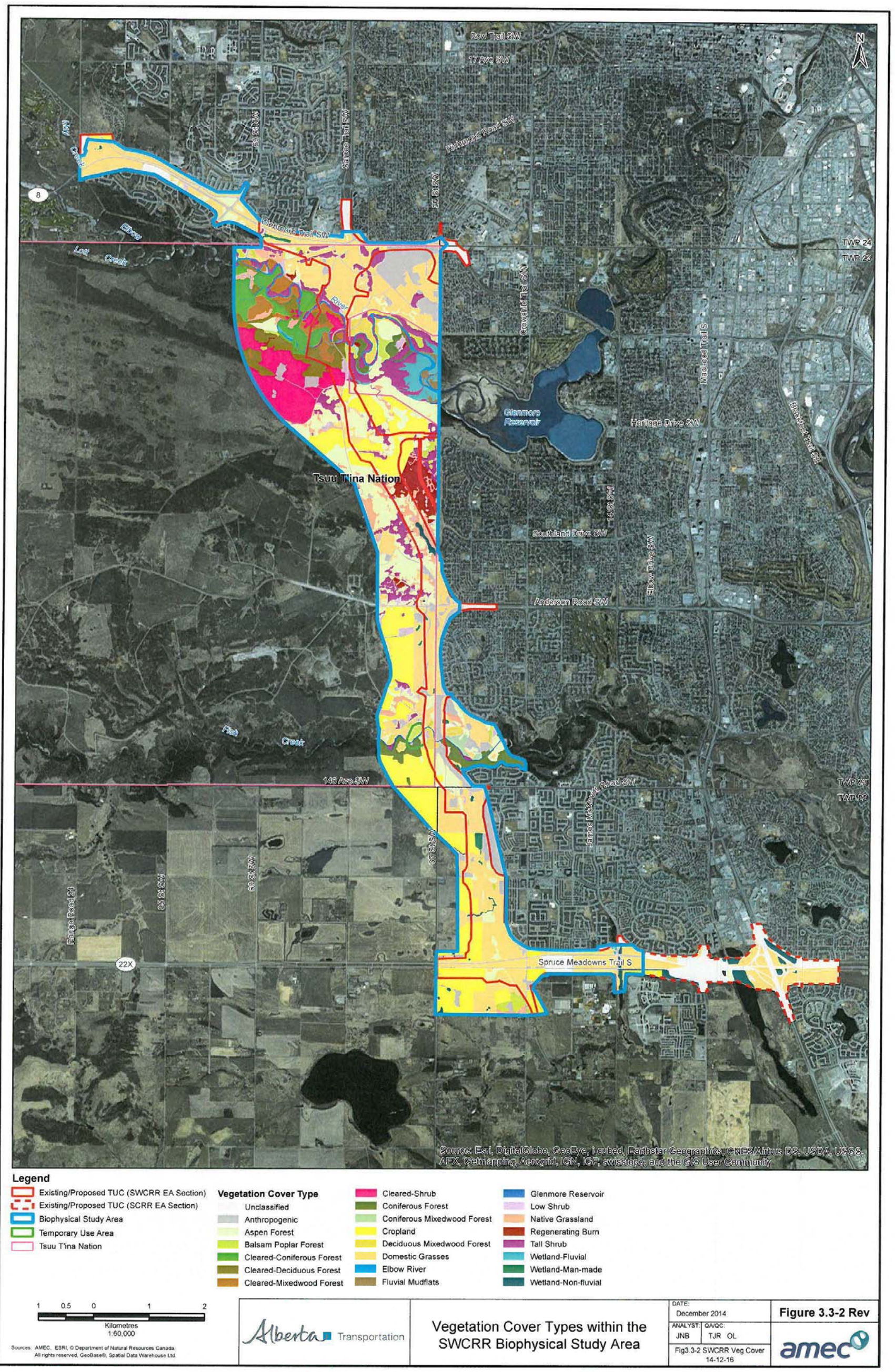
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Lott Creek
May Creek
Sarcee Trail SW
Richmond Road SW
Crowfoot Trail SW
Macleod Trail S
Glenmore Reservoir
Heritage Drive SW
Blackfoot Trail SE
Tsuu T'ina Nation
Southland Drive SW
Elbow Drive SW
Anderson Road SW
Fish Creek
148 Ave SW
James McKevitt Road SW
Range Road 24
Spruce Meadowns Trail S
TWP 24
TWP 23
TWP 22
N
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Legend
Existing/Proposed TUC (SWCRR EA Section)
Existing/Proposed TUC (SCRR EA Section)
Biophysical Study Area
Temporary Use Area
Tsuu T'ina Nation
Vegetation Cover Type
Unclassified
Anthropogenic
Aspen Forest
Balsam Poplar Forest
Cleared-Coniferous Forest
Cleared-Deciduous Forest
Cleared-Mixedwood Forest
Cleared-Shrub
Coniferous Forest
Coniferous Mixedwood Forest
Cropland
Deciduous Mixedwood Forest
Domestic Grasses
Elbow River
Fluvial Mudflats
Glenmore Reservoir
Low Shrub
Native Grassland
Regenerating Burn
Tall Shrub
Wetland-Fluvial
Wetland-Man-made
Wetland-Non-fluvial
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Kilometres
1:60,000
Sources: AMEC, ESRI, © Department of Natural Resources Canada. All rights reserved, GeoBase®, Spatial Data Warehouse Ltd.
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Alberta Transportation
Vegetation Cover Types within the SWCRR Biophysical Study Area
DATE: December 2014
ANALYST: JNB
QA/QC: TJR OL
Fig3.3-2 SWCRR Veg Cover 14-12-16
Figure 3.3-2 Rev
amec

Alberta Transportation
Environmental Assessment for the Southwest Calgary Ring Road
Calgary, Alberta
December 2014

Ecosite Map Legend – SWCRR Environmental Study Area

Ecosite Code	Dominant Vegetation	Surficial Material	Landform	Surface Texture	Drainage	Moisture Regime	Percent Slope	Soil Subgroup
4F2.14	Aspen forest – slope	Fluvial	Slope	Sandy Loam	Moderate to Well	Mesic	>30	Orthic Eutric Brunisol/Regosol
4F2.15	Balsam poplar forest	Fluvial	Slope	Sandy Loam	Moderate to Imperfect	Subhygric	15-45	Orthic Eutric Brunisol
4F2.16	Deciduous – mixedwood forest	Fluvial	Slope	Sandy Loam	Moderate	Mesic	15-60	Orthic Eutric Brunisol
4F2.18	White spruce forest	Fluvial	Slope			Mesic	30-60	
4F2.24	Cleared – closed deciduous forest	Fluvial	Slope	Sandy Loam	Moderate to Well	Mesic	>30	Orthic Eutric Brunisol/Regosol
4F2.26	Cleared – closed white spruce forest	Fluvial	Slope			Mesic	>15	
4F2.27	Cleared – open deciduous forest	Fluvial	Slope	Sandy Loam	Moderate to Well	Mesic	>15	Orthic Eutric Brunisol/Regosol
4F2.28	Cleared – open mixedwood forest	Fluvial	Slope			Mesic	15-45	
4F2.3	Domestic grasses	Fluvial	Slope			Mesic	>10	
4F2.4	Native grassland	Fluvial	Slope			Mesic	>15	
4F2.6	Low shrub – slope	Fluvial	Slope	Sandy	Well	Xeric	>75	Regosol
4F2.9	Tall shrub – riverbank	Fluvial	Nip slope/ riverbank	Sandy Loam	Well	Submesic	>45	Orthic Eutric Brunisol
4F3.14	Aspen forest – slope	Fluvial	Ravine slope	Sandy Loam	Well	Mesic	15-60	Eutric and Melanic Brunisol
4F3.18	White spruce forest	Fluvial	Ravine slope	Sandy Loam		Submesic	15-60	
4F3.24	Cleared – closed deciduous forest	Fluvial	Ravine slope	Sandy Loam	Well	Mesic	15-60	Eutric and Melanic Brunisol
4F3.3	Domestic grasses	Fluvial	Ravine slope	Sandy Loam		Submesic	>30	
4F3.4	Native grassland	Fluvial	Ravine slope	Sandy Loam	Well	Subxeric	30-45	Black Chernozem/Gleysol
4F3.6	Low shrub – slope	Fluvial	Ravine slope	Sandy Loam		Submesic	15-30	
4F4.10	Tall shrub – terrace/plain	Fluvial	Terrace			Subhygric	0 to 5	
4F4.12	Burnt – poplar	Fluvial	Terrace	Sandy Loam	Moderate	Mesic	0-5	Orthic Eutric Brunisol/Regosol
4F4.13	Aspen forest – terrace/plain	Fluvial	Terrace	Sandy	Well	Mesic	2 to 5	Orthic Eutric Brunisol

Alberta Transportation
Environmental Assessment for the Southwest Calgary Ring Road
Calgary, Alberta
December 2014

Ecosite Map Legend – SWCRR Environmental Study Area

Ecosite Code	Dominant Vegetation	Surficial Material	Landform	Surface Texture	Drainage	Moisture Regime	Percent Slope	Soil Subgroup
4F4.15	Balsam poplar forest	Fluvial	Terrace	Sandy Loam	Well	Subhygric	0-5	Orthic Eutric Brunisol
4F4.16	Deciduous – mixedwood forest	Fluvial	Terrace	Sandy Loam	Imperfect	Subhygric	0-2	Orthic Eutric Brunisol
4F4.17	Coniferous – mixedwood forest	Fluvial	Terrace	Sandy	Well	Submesic	2 to 5	Orthic Eutric Brunisol
4F4.18	White spruce forest	Fluvial	Terrace	Sandy Loam	Imperfect	Subhygric	0-2	Orthic Eutric Brunisol
4F4.2	Cropland	Fluvial	Terrace	Sandy Loam		Submesic	<15	
4F4.21	Fluvial mudflats	Fluvial	Terrace		Very Poor	Hygric	0-2	Gleysols
4F4.24	Cleared – closed deciduous forest	Fluvial	Terrace	Sandy Loam	Well	Subhygric	0-5	Orthic Eutric Brunisol
4F4.25	Cleared – closed mixedwood forest	Fluvial	Terrace	Sandy Loam	Imperfect	Subhygric	0-2	Orthic Eutric Brunisol
4F4.26	Cleared – closed white spruce forest	Fluvial	Terrace	Sandy Loam	Imperfect	Subhygric	0-2	Orthic Eutric Brunisol
4F4.27	Cleared – open deciduous forest	Fluvial	Terrace	Sandy Loam	Well	Subhygric	0-5	Orthic Eutric Brunisol
4F4.28	Cleared – open mixedwood forest	Fluvial	Terrace	Sandy	Well	Submesic	2 to 5	Orthic Eutric Brunisol
4F4.29	Cleared – open white spruce forest	Fluvial	Terrace	Sandy	Well	Submesic	2 to 5	Orthic Eutric Brunisol
4F4.3	Domestic grasses	Fluvial	Terrace			Mesic	0-2	
4F4.30	Cleared – mixed shrubs	Fluvial	Terrace			Mesic	0-5	
4F4.4	Native grassland	Fluvial	Terrace			Mesic	2 to 5	
4F4.42		Fluvial	Terrace			Mesic		
4F4.5	Low shrub – terrace/plain	Fluvial	Terrace	Sandy	Well	Submesic	0-2	Black Chernozem
4F5.6	Low shrub – slope	Fluvial	Nip slope/ riverbank	Sandy Loam	Well	Subxeric	>60	Regosol
4F5.9	Tall shrub – riverbank	Fluvial	Nip slope/ riverbank			Xeric	>60	Regosol and Not Soil
4F6.7	Tall shrub – deltaic	Fluvial	Delta	Loamy Sand	Imperfect	Hygric	0-2	Orthic Eutric Brunisol
4F8.30	Cleared – mixed shrubs	Fluvial	Low terrace/ gravel bed	Loam	Poor	Subhydric	0-5	Rego Humic Gleysol
4F8.4	Native grassland	Fluvial	Low terrace/ gravel bed			Subxeric	2 to 5	
4F8.8	Tall shrub – streamside	Fluvial	Low terrace/ gravel bed	Loam	Poor	Subhydric	0-5	Rego Humic Gleysol
4G1.10	Tall shrub – terrace/plain	Glaciofluvial	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem

Alberta Transportation
Environmental Assessment for the Southwest Calgary Ring Road
Calgary, Alberta
December 2014

Ecosite Map Legend – SWCRR Environmental Study Area

Ecosite Code	Dominant Vegetation	Surficial Material	Landform	Surface Texture	Drainage	Moisture Regime	Percent Slope	Soil Subgroup
4G1.11	Burnt – willow	Glaciofluvial	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4G1.12	Burnt – poplar	Glaciofluvial	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4G1.13	Aspen forest – terrace/plain	Glaciofluvial	Plain	Sandy Loam	Moderate	Mesic	2 to 5	Orthic Black Chernozem
4G1.15	Balsam poplar forest	Glaciofluvial	Plain			Mesic	<15	
4G1.2	Cropland	Glaciofluvial	Plain	Loamy Sand	Well	Mesic	2 to 9	Orthic Black Chernozem
4G1.3	Domestic grasses	Glaciofluvial	Plain	Loamy Sand	Well	Mesic	2 to 9	Orthic Black Chernozem
4G1.30	Cleared – mixed shrubs	Glaciofluvial	Plain	Sandy Loam	Moderate to Well	Mesic	0-5	Orthic Black Chernozem
4G1.4	Native grassland	Glaciofluvial	Plain			Mesic	2 to 5	
4G1.5	Low shrub – terrace/plain	Glaciofluvial	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4L1.10	Tall shrub – terrace/plain	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4L1.12	Burnt – poplar	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4L1.13	Aspen forest – terrace/plain	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4L1.15	Balsam poplar forest	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4L1.2	Cropland	Lacustrine	Plain	Loamy Sand	Well	Mesic	2 to 9	Orthic Black Chernozem
4L1.27	Cleared – open deciduous forest	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4L1.3	Domestic grasses	Lacustrine	Plain	Loamy	Well	Mesic	2 to 15	Orthic Black Chernozem
4L1.30	Cleared – mixed shrubs	Lacustrine	Plain	Sandy Loam	Moderate to Well	Mesic	0-5	Orthic Black Chernozem
4L1.4	Native grassland	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Orthic Black Chernozem
4L1.5	Low shrub – terrace/plain	Lacustrine	Plain	Loamy	Well	Mesic	2 to 5	Black Chernozem
4M1.10	Tall shrub – terrace/plain	Moraine	Plain	Loamy Sand	Well	Mesic	2 to 5	
4M1.11	Burnt – willow	Moraine	Plain	Loamy Sand	Well	Mesic	2 to 5	
4M1.12	Burnt – poplar	Moraine	Plain	Loamy Sand	Well	Mesic	2 to 5	
4M1.13	Aspen forest – terrace/plain	Moraine	Plain	Sandy Loam	Moderate	Mesic	2 to 5	Orthic Black Chernozem
4M1.15	Balsam poplar forest	Moraine	Plain			Mesic	<15	
4M1.2	Cropland	Moraine	Plain	Loamy Sand	Well	Mesic	2 to 9	Orthic Black Chernozem
4M1.3	Domestic grasses	Moraine	Plain	Loamy	Well	Mesic	2 to 5	Orthic Black Chernozem
4M1.30	Cleared – mixed shrubs	Moraine	Plain			Mesic	<30	
4M1.4	Native grassland	Moraine	Plain			Mesic	2 to 5	

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Calgary, Alberta
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Ecosite Map Legend – SWCRR Environmental Study Area

Ecosite Code	Dominant Vegetation	Surficial Material	Landform	Surface Texture	Drainage	Moisture Regime	Percent Slope	Soil Subgroup
4M1.5	Low shrub – terrace/plain	Moraine	Plain	Loamy Sand	Well	Mesic	2 to 5	
4M2.14	Aspen forest – slope	Moraine	Slope	Sandy Loam	Moderate to Well	Mesic	>30	Orthic Eutric Brunisol/Regosol
4M2.27	Cleared – open deciduous forest	Moraine	Slope	Sandy	Well	Mesic	2 to 5	Orthic Eutric Brunisol
4M2.28	Cleared – open mixedwood forest	Moraine	Slope			Mesic	15-45	
4W0.1	Glenmore reservoir	Water/Wetlands			Lake	Hydric	0-5	
4W0.2	Elbow River	Water/Wetlands			Stream	Hydric	0-5	
4W1.22	Wetland nonfluvial – shallow wetland	Water/Wetlands	Plain		Standing Water	Hydric		
4W6.19	Wetland fluvial – shrubby	Water/Wetlands	Delta	Loamy Sand	Imperfect to Very Poor	Subhydric	0-2	Gleysol
4W7.20	Wetland fluvial – beaked sedge/standing water	Water/Wetlands	Meander scar	Loamy	Poor	Subhydric	0-2	Humic Gleysol
4W9.23	Wetland nonfluvial – Man-made	Water/Wetlands	Variable		Poor	Hydric	0 to 2	
A	Anthropogenic	Variable	Variable			Mesic		

APPENDIX J

Wildlife Observations

Common Name	Scientific Name
Birds	
American coot	*Fulica americana*
American Robin	*Turdus migratorius*
American widgeon	*Anas americana*
barn swallow	*Hirundo rustica*
black tern	*Chlidonias niger*
blackbilled magpie	*Pica hudsonia*
black-capped chickadee	*Poecile atricapillus*
blue-winged tea	*Anas discors*
brewer’s blackbird	*Euphagus cyanocephalus*
Bufflehead	*Bucephala albeola*
clay-coloured sparrow	*Spizella pallida*
cliff swallow	*Petrochelidon pyrrhonota*
downy woodpecker	*Picoides pubescens*
Franklin's gull	*Leucophaeus pipixcan*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
northern shoveler	*Anas clypeata*
redhead	*Aythya americana*
red-tailed hawk	*Buteo jamaicensis*
red-winged blackbird	*Agelaius phoeniceus*
ring-necked grebe	*Podiceps grisegena*
scaup species	*Aythya spp.*
song sparrow	*Melospiza melodia*
sora	*Porzana carolina*
spotted sandpiper	*Actitis macularius*
white throated sparrow	*Zonotrichia albicollis*
Wilson’s phalarope	*Phalaropus tricolor*
yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Amphibians	
boreal chorus frog	*Pseudacris maculata*
wood frog	*Lithobates sylvaticus*
Mammals	
deer	*Odocoileus spp.*
beaver	*Castor canadensis*
muskrat	*Ondatra zibethicus*

APPENDIX K

ABWRET-A Scores

Function (ABWRET-A Raw Score)	W13	W14	W15	W07	W09	W01	W10	W08	W11	W12	W04	W06
Surface Water Storage (WS)	5.92	5.86	6.75	2.82	5.24	5.63	5.58	2.93	5.46	2.33	5.88	6.53
Stream Flow Support (SFS)	0.00	0.00	0.00	3.32	0.00	0.00	0.00	3.26	0.00	2.99	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	3.54	0.00	0.00	0.00	3.81	0.00	2.56	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	2.85	10.00	10.00	10.00	2.95	10.00	1.61	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	3.15	10.00	10.00	10.00	3.44	10.00	2.08	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	4.39	10.00	10.00	10.00	4.60	10.00	3.65	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	4.71	0.00	0.00	0.00	5.19	0.00	3.90	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.84	5.64	5.43	1.64	4.76	4.87	4.89	4.99	7.38	5.22	1.39	7.74
Amphibian Habitat (AM)	2.40	2.90	2.94	1.58	2.30	2.53	4.32	2.41	4.62	4.18	1.30	5.22
Waterbird Habitat (WB)	3.72	4.53	4.57	2.64	3.81	3.88	5.23	4.14	6.27	5.08	1.75	6.71
Songbird, Raptor, & Mammal Habitat (SBM)	2.76	3.23	3.83	3.88	2.71	2.71	3.91	3.68	6.56	3.95	3.09	6.12
Pollinator & Native Plant Habitat (PH)	3.20	3.14	3.91	5.49	4.79	4.14	5.09	5.81	4.74	4.06	4.46	6.53
Human Use & Recognition (HU)	4.00	3.67	4.52	3.47	3.21	3.57	2.50	2.60	4.29	2.53	3.48	3.91
Function (ABWRET-A Normalized Score)	W13	W14	W15	W07	W09	W01	W10	W08	W11	W12	W04	W06
Surface Water Storage (WS)	0.81	0.79	0.95	0.26	0.69	0.76	0.75	0.28	0.72	0.18	0.80	0.91
Stream Flow Support (SFS)	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.53	0.00	0.49	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.55	0.00	0.37	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	0.08	1.00	1.00	1.00	0.09	1.00	0.00	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	0.17	1.00	1.00	1.00	0.21	1.00	0.04	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	0.13	1.00	1.00	1.00	0.16	1.00	0.02	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.80	0.00	0.60	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.47	0.58	0.55	0.06	0.46	0.48	0.48	0.49	0.81	0.53	0.02	0.86
Amphibian Habitat (AM)	0.30	0.38	0.38	0.16	0.28	0.32	0.61	0.30	0.66	0.59	0.12	0.76
Waterbird Habitat (WB)	0.22	0.32	0.33	0.09	0.23	0.24	0.41	0.28	0.54	0.39	0.00	0.59
Songbird, Raptor, & Mammal Habitat (SBM)	0.22	0.31	0.42	0.43	0.21	0.21	0.43	0.39	0.93	0.44	0.28	0.85
Pollinator & Native Plant Habitat (PH)	0.26	0.25	0.38	0.66	0.54	0.42	0.59	0.72	0.53	0.41	0.48	0.84
Human Use & Recognition (HU)	0.58	0.52	0.68	0.48	0.43	0.50	0.29	0.31	0.64	0.29	0.48	0.56
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	W13	W14	W15	W07	W09	W01	W10	W08	W11	W12	W04	W06
Normalized Hydrological Health (HH)	0.81	0.79	0.95	0.54	0.69	0.76	0.75	0.53	0.72	0.49	0.80	0.91
Normalized Water Quality (WQ)	1.00	1.00	1.00	0.73	1.00	1.00	1.00	0.80	1.00	0.60	1.00	1.00
Normalized Ecological Health (EH)	0.47	0.58	0.55	0.66	0.54	0.48	0.61	0.72	0.93	0.59	0.48	0.86
Normalized Human Use (HU)	0.58	0.52	0.68	0.48	0.43	0.50	0.29	0.31	0.64	0.29	0.48	0.56
RWVAU #	13	13	13	13	13	13	13	13	13	13	13	13
Normalized Value Score (ABWRET_a)	0.74	0.76	0.82	0.63	0.71	0.72	0.74	0.64	0.86	0.53	0.73	0.89
Value Category (a, b, c, d)	c	c	b	d	d	c	c	d	b	d	c	a
Abundance Factor	1	1	1	1	1	1	1	1	1	1	1	1
Final Score(A, B, C, D)	B	B	A	C	C	B	B	C	A	C	B	A

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Function (ABWRET-A Raw Score)	W16	W19	W24	W22	W23	W27	W31	W32	W21	W20	W26	W30
Surface Water Storage (WS)	6.26	6.27	1.94	2.84	2.55	5.41	2.92	5.88	5.52	6.24	5.62	5.76
Stream Flow Support (SFS)	0.00	0.00	0.00	4.33	5.03	0.00	4.23	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	4.00	4.49	0.00	3.69	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	2.68	2.60	10.00	2.70	10.00	10.00	10.00	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	2.23	3.23	10.00	2.99	10.00	10.00	10.00	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	4.20	4.38	10.00	3.84	10.00	10.00	10.00	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	4.34	4.48	0.00	3.34	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	5.55	5.79	4.56	5.97	0.00	0.00	0.00	4.56	0.00
Aquatic Invertebrate Habitat (INV)	5.05	4.79	4.28	3.70	4.60	2.26	3.76	3.01	5.42	3.26	1.79	2.27
Amphibian Habitat (AM)	2.75	2.61	2.43	2.69	3.25	1.29	2.98	1.51	2.87	1.86	1.04	1.39
Waterbird Habitat (WB)	4.56	4.45	4.33	5.06	5.14	3.63	4.49	3.12	4.93	4.05	3.33	3.42
Songbird, Raptor, & Mammal Habitat (SBM)	3.22	3.15	3.05	3.93	4.37	2.83	4.94	2.26	3.14	2.90	2.76	3.56
Pollinator & Native Plant Habitat (PH)	2.70	3.00	2.90	3.38	3.31	2.76	3.77	2.36	2.90	3.02	2.71	3.34
Human Use & Recognition (HU)	3.85	3.76	3.38	3.92	4.76	4.70	6.16	3.55	3.76	3.35	4.75	4.02
Function (ABWRET-A Normalized Score)	W16	W19	W24	W22	W23	W27	W31	W32	W21	W20	W26	W30
Surface Water Storage (WS)	0.87	0.87	0.11	0.27	0.22	0.72	0.28	0.80	0.74	0.86	0.75	0.78
Stream Flow Support (SFS)	0.00	0.00	0.00	0.70	0.82	0.00	0.69	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.58	0.65	0.00	0.54	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	0.06	0.05	1.00	0.06	1.00	1.00	1.00	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	0.06	0.18	1.00	0.15	1.00	1.00	1.00	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	0.10	0.13	1.00	0.05	1.00	1.00	1.00	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.67	0.69	0.00	0.51	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.79	0.82	0.65	0.85	0.00	0.00	0.00	0.65	0.00
Aquatic Invertebrate Habitat (INV)	0.50	0.47	0.40	0.33	0.44	0.14	0.33	0.23	0.55	0.27	0.07	0.14
Amphibian Habitat (AM)	0.35	0.33	0.30	0.34	0.43	0.11	0.39	0.15	0.37	0.21	0.07	0.13
Waterbird Habitat (WB)	0.33	0.31	0.30	0.39	0.40	0.21	0.32	0.15	0.37	0.26	0.18	0.19
Songbird, Raptor, & Mammal Habitat (SBM)	0.31	0.29	0.27	0.44	0.52	0.23	0.63	0.13	0.29	0.25	0.22	0.37
Pollinator & Native Plant Habitat (PH)	0.17	0.22	0.21	0.29	0.28	0.18	0.36	0.11	0.21	0.23	0.17	0.28
Human Use & Recognition (HU)	0.55	0.53	0.46	0.57	0.73	0.72	1.00	0.49	0.54	0.45	0.73	0.59
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	W16	W19	W24	W22	W23	W27	W31	W32	W21	W20	W26	W30
Normalized Hydrological Health (HH)	0.87	0.87	0.11	0.70	0.82	0.72	0.69	0.80	0.74	0.86	0.75	0.78
Normalized Water Quality (WQ)	1.00	1.00	1.00	0.67	0.69	1.00	0.54	1.00	1.00	1.00	1.00	1.00
Normalized Ecological Health (EH)	0.50	0.47	0.40	0.79	0.82	0.65	0.85	0.23	0.55	0.27	0.65	0.37
Normalized Human Use (HU)	0.55	0.53	0.46	0.57	0.73	0.72	1.00	0.49	0.54	0.45	0.73	0.59
RWVAU #	13	13	13	13	13	13	13	13	13	13	13	13
Normalized Value Score (ABWRET_a)	0.77	0.75	0.50	0.70	0.77	0.78	0.72	0.66	0.74	0.68	0.79	0.70
Value Category (a, b, c, d)	c	c	d	d	c	c	c	d	c	d	c	d
Abundance Factor	1	1	1	1	1	1	1	1	1	1	1	1
Final Score(A, B, C, D)	B	B	D	C	B	B	B	C	B	C	B	C

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