Willow Ranch Biophysical Impact Assessment

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Land & Water Resources Management Consultants

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Executive Summary

The Willow Ranch residential development is proposed in the Springbank area of Rocky View County, AB (portion of SE 21-24-03 W5M). Westhoff Engineering Resources Inc. was retained to prepare a Biophysical Impact Assessment for the proposed development. Westhoff prepared the BIA referring to the 2013 Rocky View County Servicing Standards, Section 904.1 and the Alberta Wetland Assessment and Impact Report Directive 2015, No, 8 (Alberta Environment and Parks 2017).

This BIA was prepared ahead of the primary field season (May to September). Field inventories of vegetation, soils, wetlands, and wildlife will be initiated in the spring of 2021 and sample results will be reported to Rocky View County in a follow-up Biophysical Inventory Report.

Existing conditions

The Project Site is within the Parkland Natural Region and the Foothills Parkland Natural Subregion. Local soils consist of Orthic Black Chernozems (Alberta Agriculture and Rural Development 2019). Terrain conditions are variable with relatively mild undulating grades throughout most of the uplands. There are steeper slopes adjacent Springbank Creek: a drainage that meanders through the northern Site border. A culvert under Range Rd. 33 to the east supports drainage southeast of the Project Site. We identify this reach of the Creek as a "Transitional Stream".

A residence and associated out-buildings in the northeast corner of the Project Site were established as early as 1962 and remain on site today. Identified plant communities include Pastureland (grassland), Disturbed, Deciduous forest, Wetlands, Ephemeral waterbodies, and Drainage. There are no known observations of provincially listed plant species on or in the vicinity of the Site; species occurrence to be confirmed with field surveys.

We identify 16 wetlands within the Project Site totaling 3.44 ha, including wetland areas along the Creek. The wetlands are classified as Temporary to Seasonal graminoid marshes. We also identify 13 ephemeral waterbodies totaling 0.64 ha. All Project Site waterbodies were submitted for review at the Water Boundaries Division of Public Lands on February 28, 2021. We are awaiting correspondence from AEP to confirm if any of the waterbodies within the Project Site are claimed by the Crown.

We identify a total of approximately 175 birds, 30 mammals, 4 reptiles, and 5 amphibians that may potentially occur within the Project Site based on species distribution and habitat preferences. A number of these potential species have been provincially identified and/or federally listed as species of conservation concern. Wildlife are likely to move relatively freely within the Site and surrounding areas. The creek drainage is likely to be used as a travel corridor through the region; however, Range Rd. 33 is a potential barrier and/or a collision hazard for regional movements.

Based on provincial criteria, we identify the Creek and associated drainage valley as an Environmentally Significant Area.

We overlaid the Listing of Historic Resources on the Project Site in ArcGIS. The Listing shows that the Project Site is listed as 5a, which means that the Project Site has high potential to contain historic archaeological resources (Alberta Culture and Tourism 2016). A formal assessment of historical resources is not included as part of this BIA

Potential Impacts and Mitigations

The predicted impacts of the residential development on identified biophysical conditions were determined with reference to the concept prepared by B&A Planning Group in March 2021.

Potential impacts of the development are

- Local loss of native soils and alterations to topography and surface hydrology;
- Local loss or alteration of native upland vegetation within building envelopes;
- Weed invasion and changes in native species composition of residual landscapes;
- Loss of wetlands within building envelopes;
- Water quality contamination of wetlands and the creek; and
- Loss or disturbance of wildlife, habitat, and movements.

Identified mitigation measures to reduce or eliminate these potential impacts are:

- Retention of the Creek drainage and designation of an associated Environmental Setback;
- Retention, where possible, of the majority of wetlands;
- Restricting development to identified building envelopes;
- Erosion and sediment controls applied pre, during and post construction;
- Environmental Protection Planning to Rocky View standards;
- Landscaping with native plant species and effective weed controls;
- Stormwater management strategies emphasizing Low Impact Development practises, water quality management, and rate and volume controls;
- A landowner's manual providing environmental guidelines to residents; and
- Timing of construction to avoid the critical breeding window: April 1 to August 31.

Residual Impacts and Significance

We identify the potential environmental impacts associated with the proposed development that we predict will persist after mitigation measures are implemented.

The proposed development will result in the permanent loss of some upland deciduous forest. At the time this BIA was prepared, there was no formal process, or available provincial or municipal criteria, for determining what qualifies as a significant residual loss of native

vegetation. We conclude that no significant residual impacts are predicted as a result of the anticipated local loss of deciduous forest provided the majority of these forests are retained.

Wetlands may be permanently lost or altered as a result of the proposed development. Wetland loss will be mitigated by providing wetland replacement through existing provincial approval processes under the Alberta Wetland Policy. Wetland replacement is an accepted approach to managing loss of wetlands on both provincial and municipal scales.

Accidental death or damage to individual wildlife species can occur when vegetated areas are disturbed or lost. Timing the stripping and grading activities to occur outside the sensitive breeding season for most wildlife will significantly reduce the risk of wildlife fatality but will not eliminate it.

The loss of a listed species due to stripping and grading would be a significant residual impact. However, we expect the fatality risk to listed species is negligible due to the low quality of available habitat and given that stripping and grading will occur outside the breeding season or only after active nest/burrow surveys are completed and associated Best Management Practices are implemented.

Cumulative Effects

Cumulative effects are the changes to the environment caused by all past, present, and reasonably foreseeable future human activities (Alberta Environment 2018). Our approach to the identification and description of potential cumulative impacts adopts elements of CEA by first selecting Valued Ecosystem Components (VECs) that we expect may be sensitive to these impacts.

Wetlands are recognized federally as a VEC because of their important ecological functions and associated socio-economic values (Hanson, et al. 2008). Wetland losses may be incurred as a result of the proposed Willow Ranch development. To date, the cumulative effects of development on wetlands have been mitigated primarily through the Alberta Wetland Policy wetland replacement program. Overall, we anticipate that the cumulative effects on wetlands in this region will be managed through the retention of priority wetlands outside the Project Site coupled with the application of provincially approved wetland replacement measures.

We also identify Environmentally Significant Areas as VECs for the purpose of this cumulative effect's evaluation. Any development within Rocky View County that results in the loss of an ESA we expect would contribute to an adverse cumulative effect on natural landscapes in the region as whole. The retention of the identified ESA within the Project Site supports the conclusion that no significant cumulative effects are expected as a result of the proposed development.

Follow-Up

Field surveys in the growing season were not included as part of this BIA. These surveys will be completed in the spring of 2021 and will be submitted as supplementation information to Rocky View County.

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1 Introduction

The Willow Ranch residential development is proposed in a portion of SE 21-24-03 W5M in Rocky View County, AB (Figure 1). The Project Site is bordered by Range Rd. 33 to the east and residential properties to the north and south. The Site consists of residential lands with disturbed areas, pasture lands, aspen forest, wetlands, ephemeral waterbodies, and a natural drainage.

1.1 Purpose

Westhoff Engineering Resources Inc. (Westhoff) was retained to prepare a Biophysical Impact Assessment for the development. Westhoff prepared this report referring to the 2013 Rocky View County Servicing Standards, Section 904.1 and the Alberta Wetland Assessment and Impact Report Directive 2015, No, 8 (Alberta Environment and Parks 2017).

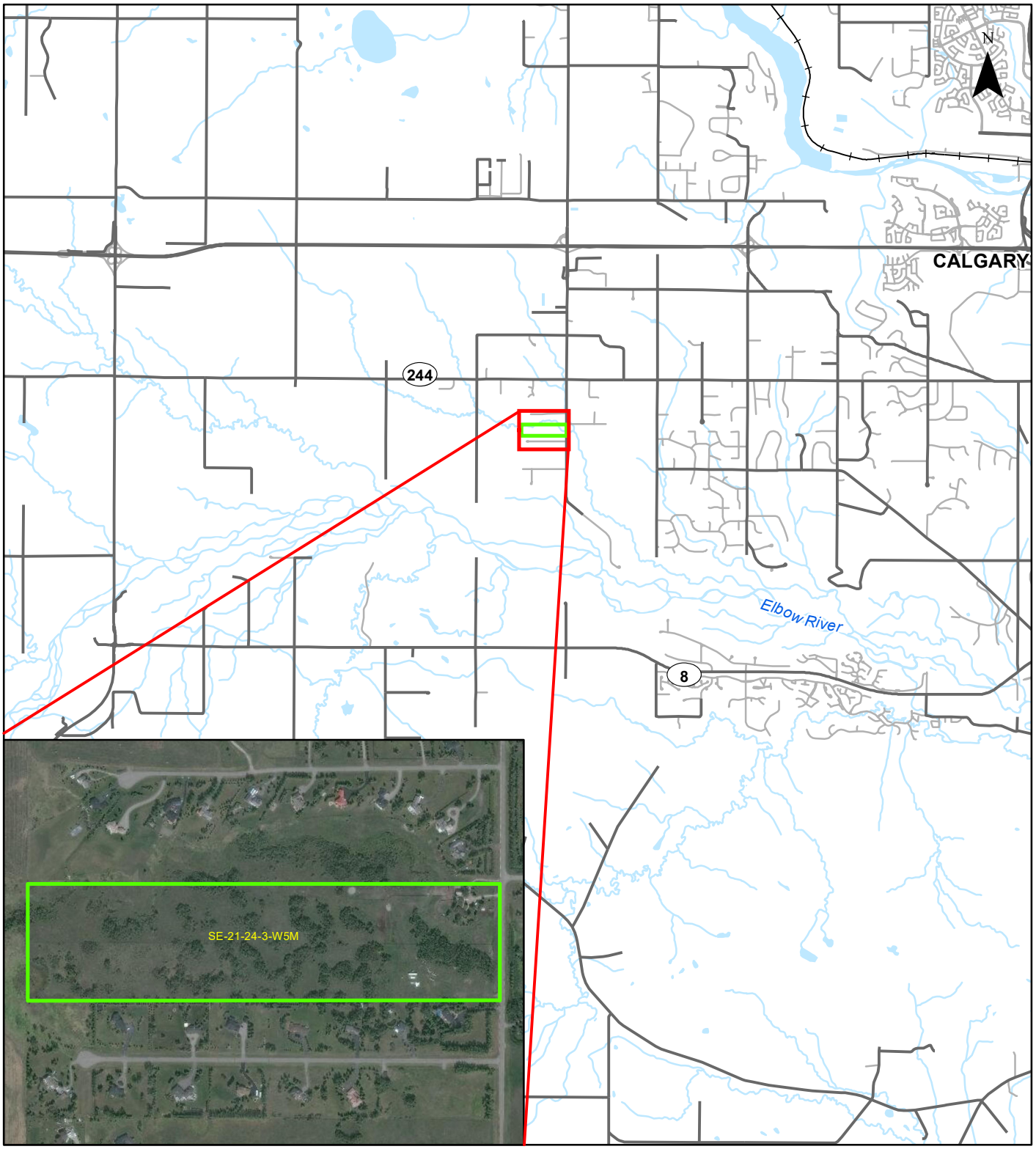
The objectives of this BIA are to:

- describe existing environmental conditions within and adjacent to the Project Site:
  - describe the biophysical features of the Site, including soils, vegetation, landform, hydrology, wildlife; sensitive species, rare plants and rare ecological communities;
  - identify and delineate wetlands with reference to the Alberta Wetland Identification and Delineation Directive;
  - classify wetlands in accordance with the Alberta Wetland Classification System (AWCS);
  - provide results of the relative value assessment computed by the Province based on data collected through the relative value assessment (ABWRET-A);
- identify potential impacts of the Project on existing conditions, in particular wetlands;
- recommend mitigation measures to reduce, eliminate or compensate for these potential impacts; and
- describe the possible cumulative effects associated with the Project.

This BIA was prepared ahead of the primary field season, from May to September. Field inventories of vegetation, soils, wetlands, and wildlife will be initiated in the spring of 2021 and sample results will be reported to Rocky View County in a follow-up Biophysical Inventory Report.

1.2 Planning Context

The Willow Ranch development will proceed within the context of a federal and provincial regulatory framework. Table 1 provides a summary of the key policies, plans and regulations that are relevant to the Project.



LEGEND

- Major Road
- Minor Road
- Railway
- Waterbody

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	PROJECT LOCATION

Date:	Project No.:	Scale:	
04-03-2021	WER121-15	1:100,000	**FIGURE: 1**

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Table 1: Policy and Regulatory Framework

Regulation/Policy	Objectives and/or Intent	Requirements	Compliance
Migratory Bird Convention Act (MBCA) Canada Wildlife Service	Protects and conserves identified migratory birds and their nests. It includes prohibitions against harming, harassing, and/or destroying migratory birds and their nests as well as depositing harmful substances in water/areas frequented by migratory birds.	Applies primarily in the site-clearing and construction phases when avoidance of migratory birds and their nests will be required and/or appropriate mitigation measures applied.	A pre-disturbance nest sweep may be required pre, during and post construction with follow up monitoring that may be required.
Species at Risk Act (SARA) Environment Canada	Prohibits the killing, harming, or harassing of endangered or threatened species, and damage or destruction of their residence or critical habitat.	Applies primarily in the site-clearing and construction phases when avoidance of Species at Risk, their residences, and critical habitat will be required and/or appropriate mitigation measures applied. Full federal assessment in the event of an observed SARA species may be required, followed by an approval.	A pre-disturbance nest sweep may be required pre, during and post construction with follow up monitoring that may be required.
Alberta Wildlife Act Alberta Environment and Parks	Prohibits unauthorized activity on specified lands that could harm a nest or den of certain listed species.	Applies in the event provincially endangered or threatened species are identified within the Project Site and measures are required to avoid damage or loss.	Species specific wildlife surveys and monitoring may be required.
Alberta Water Act Alberta Environment and Parks	The diversion and use of water in Alberta is controlled under provisions of the Water Act.	Applies if the Project Site contains water bodies, watercourses, wetlands, drainages.	If the proposed activities result in impacts or the removal of a surface water feature the activity is subject to a Water Act approval.

Regulation/Policy	Objectives and/or Intent	Requirements	Compliance
Alberta Public Lands Act Alberta Environment and Parks	Prohibits the unauthorized use of Alberta's public lands, including the beds and shores of all-natural watercourses and permanent and naturally occurring bodies of water.	An approval process can be triggered when development of public lands is proposed, including any development that impacts the bed and shore or all-natural watercourses and permanent, naturally occurring bodies of water.	Coordinating with Public Lands may be required if any impacts to watercourses or semi-permanent or permanent water bodies/wetlands are proposed.
Alberta Soil Conservation Act Alberta Agriculture and Forestry	Discourages practices that cause soil degradation.	Must actively prevent soil loss or deterioration from taking place during project activities.	Soil best management practices to be implemented to prevent soil loss or deterioration.
Alberta Wetland Policy Alberta Environment and Parks	Provides direction and tools to conserve, restore, protect, and manage Alberta's wetlands.	Applies if disturbance of wetlands or watercourses is proposed as part of the development impacts.	Administered by Alberta Environment and Parks, Water Approvals division through Water Act applications.
Biophysical Assessment Framework, *2013 Servicing Standards*, Rocky View County	Identifying Valued Ecosystem Components (VECs) that may be impacted by the development and ensuring there is adequate protection or mitigation measures for VECs.	Biophysical Assessment must align with all relevant legislation at all levels of government.	Approval through Rocky View County.
Alberta Weed Act, Government of Alberta	Gives municipalities the authority to control designated weeds on municipal lands.	Applies primarily during site-clearing and construction phases where listed weeds must be controlled.	A pre-disturbance weed survey has been completed. Post construction monitoring will be required.
Alberta Historical Resources Act, Government of Alberta	Manages the use, designation, and protection of historic resources.	The Project does not impact land that has a Historical Resource Value in the Listing of Historic Resources.	Historical Resources Act approval is not required for this Project.
South Saskatchewan Regional Plan, Alberta Environment and Parks	Identifies long-term vision for strategic directions for the region to manage the cumulative effects of development on air, water, land, and biodiversity.	Regional planning and decision-making for the development of the South Saskatchewan region through Alberta's Land-Use Framework.	Land use planning considerations include closure of the South Saskatchewan River Basin.

Regulation/Policy	Objectives and/or Intent	Requirements	Compliance
Environmental Reserve Policy	Guidelines for Environmental Reserve setbacks in accordance with the Municipal Government Act as a means of preventing pollution of a waterbody.	Applies when development permanent built structures/developments adjacent waterbodies.	To be considered in the context of the proposed development.
Municipal Government Act	Guides how municipalities operate, regulates how municipalities are funded, and outlines how local governments should govern and plan for growth.	Of particular relevance are following Land Use designations: Environmental Reserve and Municipal Reserve for which related regulations apply.	Development must adhere to guidelines outlined in the Municipal Government Act.

2 Methods

2.1 Review of Existing Information

2.1.1 Alberta Conservation Information Management System (ACIMS)

Alberta Conservation Information Management System (ACIMS) is a provincial government organization that maintains a database and tracks information on species, communities, and sites of conservation interest (Alberta Environment and Parks 2019). We completed an ACIMS database search to identify any past observations of provincially listed plant species on or in the vicinity of the Project Site.

2.1.2 Previous Wildlife Observations

We compiled wildlife observations from the Fisheries and Wildlife Management Information System (FWMIS). FWMIS is a Government of Alberta fisheries and wildlife database administered by Alberta Environment and Parks (AEP). We completed a 3 km radius FWMIS database search to determine whether any federally listed Species At Risk or provincial species identified as Sensitive, May Be At Risk, or At Risk have been previously observed on or in the vicinity of the Site (Alberta Environment and Parks 2021).

We reviewed Alberta wildlife field guides to develop a list of amphibian, reptile, mammal and bird species that may potentially inhabit areas within the Project Site (Smith 1993, McGillivray and Semenchuk 1998, Pattie and Fisher 1999, Russel and Bauer 2000, Stebbins 2003, Semenchuck 1992). Federal and provincial wildlife databases also provided information on the general distribution of wildlife species federally-listed as Species At Risk under the Species At Risk Act (SARA) (Government of Canada 2002) or provincially identified as Sensitive, May Be At Risk or At Risk as per the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).

2.1.3 Agricultural Region of Alberta Soil Inventory Database

The Agricultural Region of Alberta Soil Inventory Database (AGRASID) identifies soil classes and groups that have been mapped throughout the province. We performed a database search to determine the types of soils that have been mapped on the Project Site (Alberta Agriculture and Rural Development 2020).

2.1.4 Historical Aerial Photographs and Precipitation Data

We refer to the Alberta Wetland Identification and Delineation Directive, 2015, No.4 (Alberta Environment and Parks 2015), to provide guidelines on the approach to our historical review. We reviewed historical aerial photographs prior to and following field surveys. Photographs were accessed through AEP and Google Earth™. A sub-set of AEP photographs was chosen based on the following criteria:

- photographs taken from multiple years over several decades;
- photographs taken in multiple seasons; and
- photographs representing the best available scale, clarity of image and availability.

The clearest photographs available on Google Earth™ were also reviewed as they provide information on the recent conditions of the Project Site.

The following aerial photographs were selected for the review (Appendix A):

- June 9, 1950 (unknown)
- September 19, 1962 (dry)
- June 12, 1974 (dry)
- September 17, 1987 (avg.)
- September 28, 2008 (wet)
- June 8, 2011 (wet)
- August 22, 2015 (dry)
- May 4, 2020 (dry)

The historical review provides an indication of changes in environmental conditions, including the distribution and extent of any detectible wetlands or drainages within the Site. We also used the photographs to document variation in surface water conditions in observed waterbodies and wetlands.

As part of the historical review process described in the Wetland Identification and Delineation Directive, precipitation data is required to correlate with the historical photographs and aid in determining wetland class (Alberta Environment and Parks 2015). We compiled precipitation data from Alberta Agriculture and Forestry to document the total amount of precipitation relative to each day, month, and year that historical aerial photographs were available (Alberta Environment and Parks 2019). This data provides insight into historical environmental conditions and whether available photographs may be associated with wet, dry, or average precipitation year. Average annual precipitation levels from 1955 to 2015 was calculated to be 450 mm. To determine whether photographs were from dry, average, or wet years, we calculated the upper and lower 25% quartile. A dry year is represented by precipitation levels below or at 398 mm and a wet year has levels at or above 509 mm.

2.1.5 Surface Hydrology

The Alberta Wetland Assessment and Impact Report Directive (Alberta Environment and Parks 2017) requests that general information on the local surface water catchments be provided to support the evaluation of any area wetlands identified within the Site. Catchments mapping for the Project Site was determined using the Spatial Analyst function in ArcGIS. The Spatial Analyst hydrology tool set was used to model the flow of water across the surface of the Project Site, allowing for watershed delineation.

2.2 Field Sampling

A reconnaissance field visit was completed on December 7, 2020, in snow free conditions, to gain general knowledge of existing biophysical conditions. The following comprehensive field surveys will be completed in the 2021 growing season:

- Amphibian survey: May/June;
- Breeding bird survey: June;
- Wetland and plant community survey: July/August;
- Wetland functional assessment: July/August; and
- Rare plant and rare ecological community survey: June and August.

Details regarding specific survey methods are provided below.

2.2.1 Plant Community Identification

Field surveys will record dominant plant species to characterize plant communities. Sample plots (with a radius of 2.5 m) will be established in each representative habitat type. Within these plots, we will record the presence and percent cover of individual plant species. Incidental observations of plant species will also be recorded while travelling between sample sites. Field survey data and aerial photograph interpretation will be used to prepare a map of plant communities.

2.2.2 Rare Vascular Plants and Rare Ecological Communities

Information on rare vascular plants and rare ecological communities will be derived from background research and field surveys conducted by Zanshin Environmental Networks Inc. (Zanshin). Zanshin followed the standardized rare plant survey methodology developed by the Alberta Native Plant Council (Alberta Native Plant Council 2000).

2.2.3 Wildlife Field Surveys

Spring amphibian call surveys will be completed at random locations at each observed water body or wetland. Survey protocol will follow Sensitive Species Inventory Guidelines methodology recommended by Alberta Sustainable Resources Development (Alberta Government 2013). April/May is within the approximate breeding season for frog and toad species with the potential to occur within the Project Site. Cool evenings are common in the

Project area; therefore, these surveys will not be conducted after sunset, but rather during the day (between approximately 10:00 am and 4:00 pm) to accommodate greater call detection.

A breeding bird call survey will be conducted at sunrise using standard procedures at multiple locations representing available habitats. Birds will be identified by male territorial breeding songs and by visual observation.

Incidental wildlife observations will be recorded while completing all formal surveys. All wildlife observations will be presented relative to the habitats where species were recorded.

2.2.4 Wetland Identification and Delineation

We referred to the Alberta Wetland Identification and Delineation Directive 2015 for guidelines on wetland identification and delineation (Alberta Environment and Parks 2015).

- A wetland is defined as land saturated with water long enough to promote the formation of water altered soils, growth of water tolerant vegetation and various kinds of biological activity that are adapted to the wet environment (Alberta Environment and Sustainable Resource Development 2013).
- The Province also defines ephemeral water bodies as areas where the terrain is by the water table near, at or above the ground surface for a short period of days (Alberta Environment and Parks 2015). However, water is not present long enough to promote the formation of water altered soils within 30 cm of the ground surface or a dominance of water tolerant vegetation.

A desktop evaluation of wetlands and ephemeral waterbodies was prepared referring to procedures outlined in the Directives, specifically referring to historical aerial photographs from multiple years and multiple seasons. Waterbody basins and boundaries were determined with reference to Appendix 2: Photo Interpretation Keys for Water and Wetland Vegetation Features from Aerial Photographs (Alberta Environment and Parks 2015). We cross referenced waterbody delineations against available topographic mapping for the area.

Wetland boundaries will be refined in the field based on wetland verses upland indicators (terrain, vegetation, and soils). The boundaries will be surveyed using a hand-held Trimble Geo7X GPS unit. Raw GPS data will be differentially corrected with data from the CAN-NET system.

An Appendix 7 field form, obtained from the Alberta Wetland Identification and Delineation Directive, will be completed for each wetland. We will also record dominant plant species at sample plots (with a radius of 2.5 m) in each representative wetland zone. Observations of previous wetland disturbance such as roadways, ditches or previous land use activities will be recorded for all wetlands.

2.2.5 Wetland Classification

A preliminary assessment of wetland classification will be completed based on historical aerial photograph review with reference to the Alberta Wetland Classification System (AWCS)

(Government of Alberta 2015). Field confirmation of wetland classification will be completed in the 2021 growing season. The final class is determined by the type of vegetation zone occurring in the central or deepest part of the wetland. This deepest vegetation zone must be 25% or more of the total wetland area.

2.2.6 Wetland Functional Assessment

An ABWRET–A form will be completed in the field for all the Project Site wetlands and submitted to AEP for review. The results of this submission provide a value rating for each wetland (Alberta Environment and Parks 2015). Field assessment is required for the assessment to be completed; therefore, no assessment results are provided in this BIA.

2.2.7 Drainage Identification

A drainage (watercourse) is defined as the bed, bank or shore of a river, stream, or creek, whether it contains or conveys water continuously or intermittently (Alberta Environment and Sustainable Resource Development 2012).

We identify drainages based on the following:

- observations of flowing water;
- the presence of a defined, non-vegetated channel; and/or
- observations of changes in grade from lowland to upland conditions.

2.2.8 Drainage Classification

We will classify any observed drainages based on the Alberta Environment and Sustainable Resource Development's Timber Harvest Planning and Operating Ground Rules (Alberta Environment and Sustainable Resource Development 2012) system used by the forestry and oil & gas sectors:

- Large Permanent: major streams and rivers with well-developed floodplains and carry flows year-round. The non-vegetated channel width is greater than 5 m.
- Small Permanent: permanent streams, often with small valley bottoms and bench floodplain development. The stream carries flow year-round but may freeze completely in winter or dry up during periods of drought. The banks and non-vegetated channel are well defined, with channel width greater than 0.7 m to 5 m.
- Transitional: small streams, often with small valley bottoms and bench floodplain development. The stream carries flow year-round but may freeze completely in winter or dry up during periods of drought. The banks and non-vegetated channel are well defined, with channel width greater than 0.4 m to 0.7 m.
- Intermittent: small stream channels with usually no terrestrial vegetation in the channel. The stream usually has some bank development and carries flows during spring runoff

and heavy rainfall. Small springs can also supply flows to intermittent streams. Channel width is less than 0.4 m.

- Ephemeral: a vegetated draw that is connected to a higher-class drainage. The draw carries flow only during or immediately after rainfall or snowmelt. There is little to no channel development.

2.3 Environmentally Significant Areas

The Environmentally Significant Areas in Alberta: 2014 Update report identifies Environmentally Significant Areas (ESAs) on a provincial scale (Fiera Biological Consulting Ltd. 2014). We overlaid these provincial ESA map results on the Project Site to determine if all or part of the Site was considered a provincial ESA.

The 2014 Update report identifies four general criteria used to assess whether an area is an ESA. The criteria are:

1. Areas that contain focal species, species groups or their habitats;
2. Areas that contain rare, unique or focal habitat, such as natural springs, Class A and B rivers and waterfowl staging areas;
3. Areas with ecological integrity, including undisturbed upland or wetland habitat; and
4. Areas that contribute to water quality.

We apply these criteria locally to evaluate whether any ESAs occur within the Project Site.

2.4 Historic Resources Assessment

Alberta Culture and Tourism maintains a digital listing of Historic Resources. The Listing identifies known lands that contain or have a high potential for historic resources. We overlaid the most current ArcGIS shapefile with our Project Site to determine if there are any potential or observed historic resources (Alberta Culture and Tourism 2016). A formal assessment of historical resources was not prepared as part of this BIA.

2.5 Identification of Impacts

We identify the predicted impacts of the proposed Willow Ranch development with reference to the concept plan prepared by B&A Planning Group in March 2021. This BIA Report does not include a comprehensive evaluation of surface or ground water conditions or an assessment of potential impacts on these water resources as a result of the proposed development.

2.6 Mitigation Measures

Mitigation measures are measures applied to eliminate, reduce, or control the predicted negative impacts of a particular project (Government of Canada 2012). We present mitigation measures that could eliminate, reduce, or control the predicted negative impacts of the Project.

2.7 Determining Significance of Residual Impacts

We identify the environmental impacts associated with the proposed project that we predict will persist after mitigation measures are implemented. We apply professional judgment in evaluating the significance of any residual impacts. The magnitude of the predicted residual impact was weighed against any positive effects of the proposed project activities.

2.8 Monitoring

Recommendations for follow-up monitoring, field surveys, or reporting are provided, as needed.

2.9 Description of Cumulative Effects

Cumulative effects are the changes to the environment caused by all past, present, and reasonably foreseeable future human activities (Alberta Environment 2018). We describe the possible changes in the environment caused by the proposed development when combined with other past, present, and reasonably foreseeable future human activities. We describe these cumulative effects in the context of the broader region.

The information and resources available for this study do not permit the assessment of cumulative impacts of the Project to be undertaken using “best practice” Cumulative Effects Assessment (CEA) methodology (Hegmann, et al. 1999). Instead, our approach is to adopt elements of CEA standard methodology in a description of possible cumulative effects.

3 Existing Environment

3.1 Natural Region

Alberta is divided into six Natural Regions based on patterns in climate, topography, soils, and vegetation (Natural Regions Committee 2006). The Project Site is within the Parkland Natural Region and the Foothills Parkland Natural Subregion. Rolling to hilly terrain conditions are typical throughout. Grasslands are often found on dry sites and aspen stands on moister, cooler northerly aspects (Natural Regions Committee 2006). The major soil groups represented in the Foothills Parkland Subregion are Black Chernozems under grasslands and Dark Grey Chernozems under forest cover (Natural Regions Committee 2006).

3.2 Terrain and Soils

Terrain conditions within the Project Site are variable with relatively mild undulating grades throughout most of the Project Site uplands. There are steeper slopes adjacent a drainage that meanders through the northern Site border. Figure 2 shows Site topography with relatively steep sides slopes, ranging from 15% to 30%, occurring in the drainage valley. The drainage is further described in Section 3.6.

Fish Creek soils are the dominant pre-disturbance soil type consisting of Orthic Black Chernozems (Alberta Agriculture and Rural Development 2019).

3.3 Historical Disturbance and Land Use

Our review of the historical aerial photographs reveals patterns in human activities and development in and around the Project Site. A residence and associated out-buildings in the northeast corner of the Project Site are visible in the historical photograph from 1962. The residence and associated out buildings remain on-site under current conditions. Early photographs show evidence of Site cultivation in the uplands, though forested areas have since established.

3.4 Plant Communities

The following plant communities exist within the Project Site, based on aerial photographs and the field reconnaissance in December 2021:

- Pastureland (grassland)
- Disturbed
- Deciduous forest
- Wetlands
- Ephemeral waterbodies
- Drainage

We note that pasturelands have residual native grassland species but had been heavily grazed, making a full evaluation of species composition difficult to complete. Disturbed lands are associated with the residence and concentrated grazing areas. Patches of deciduous forests are disbursed in the uplands, consisting mainly of aspen trees, while a large deciduous forest stand is associated with the south east portion of the drainage. Wetlands and waterbodies are described in detail in Section 3.7. The general distribution of the plant communities is presented in Figure 3.

Slopes Table				
Number	Minimum Slope	Maximum Slope	Area (ha)	Color
1	0.00%	5.00%	6.88	
2	5.00%	10.00%	5.29	
3	10.00%	15.00%	1.76	
4	15.00%	20.00%	0.95	
5	20.00%	30.00%	0.77	
6	30.00%	>%	0.21	

NOTES:

A. AREA IS WITHIN THE SPRINGBANK MASTER DRAINAGE PLAN CATCHMENT AREA.

B. LOW IMPACT DEVELOPMENT MEASURES ARE TO BE INCORPORATED TO MEET RUNOFF RELEASE RATE AT 1.7 L/S/HA AND VOLUME CONTROL AT 70mm.

C. VOLUME CONTROL SHALL BE ACHIEVED BY ON-SITE MEASURES (ABSORBENT SOILS, BIO-SWALES AND BIO-RETENTION) AND USE OF STORMWATER FOR IRRIGATION OF LANDSCAPED AREAS.

D. FUTURE DRAINAGE COURSES SHALL USE NATURAL ROUTING AS MUCH AS POSSIBLE.

E. WHERE NEEDED OIL & GRIT SEPARATORS SHALL BE INSTALLED TO REDUCE SEDIMENT LOADINGS INTO SPRINGBANK CREEK AND MEET CURRENT WATER QUALITY CRITERIA.

LEGEND:

SUBJECT PROPERTY

1:1250 — 0 10 20 30 40 50 m

REV.	DATE	REVISION DESCRIPTION	DRW	DES	CHK	APPR
5						
4						
3						
2						
1						
0	02-02-21	FOR REVIEW	MN	-		

ENGINEER'S SEAL:

PERMIT:

CLIENT:

Mr. ALLAN MARKIN

CONSULTANT:

Westhoff Engineering Resources, Inc.

Land & Water Resources Management Consultants

PROJECT:

WILLOW RANCH BIA

TITLE:

SLOPE ANALYSIS

DESIGNED:	CHECKED:	DATE:	JOB No.	FIGURE NO.
M. NAMMO	D. WESTHOFF	MARCH, 2, 2021	WER120-35	2
DRAFTED:	APPROVED:	SCALE:	CAD FILE:	
M. NAMMO	D. WESTHOFF	As Shown	12035SLP1.dwg	

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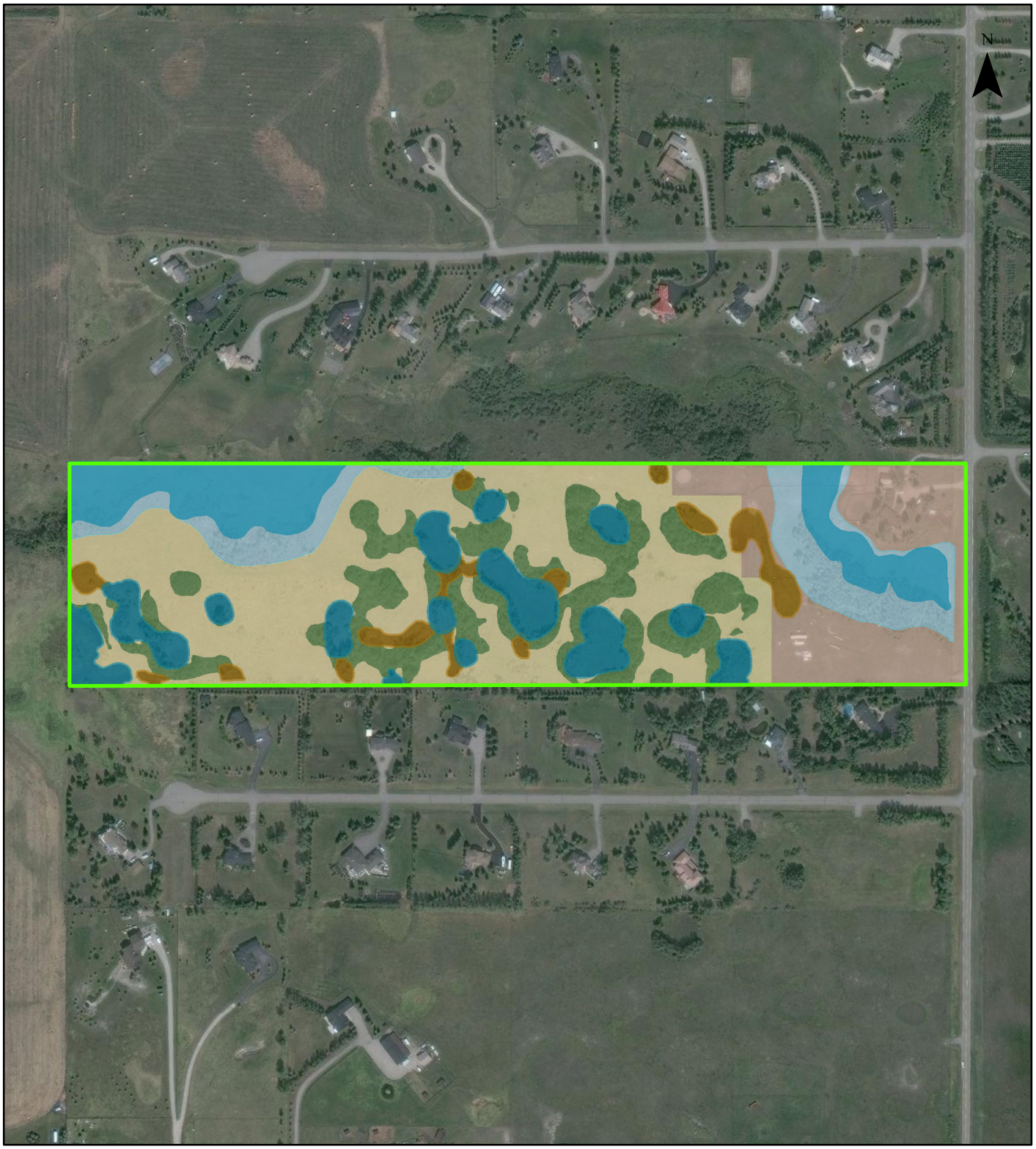

LEGEND

Imagery Source: ESRI Basemap

- Project Site
- Wetlands
- Ephemeral
- Drainage
- Decidous forest
- Disturbed
- Pastureland

Note: Wetlands, Waterbodies, Plant Communities and Drainage have been desktop delineated.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	PLANT COMMUNITIES

Date:	Project No.:	Scale:	
02-03-2021	WER121-15	1:5,000	**FIGURE: 3**

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Figure 4: Typical Upland Vegetation

Looking northeast at typical upland vegetation composition of predominantly aspen stands mixed with pasture (grasslands)

3.5 Rare Plants and Rare Ecological Communities

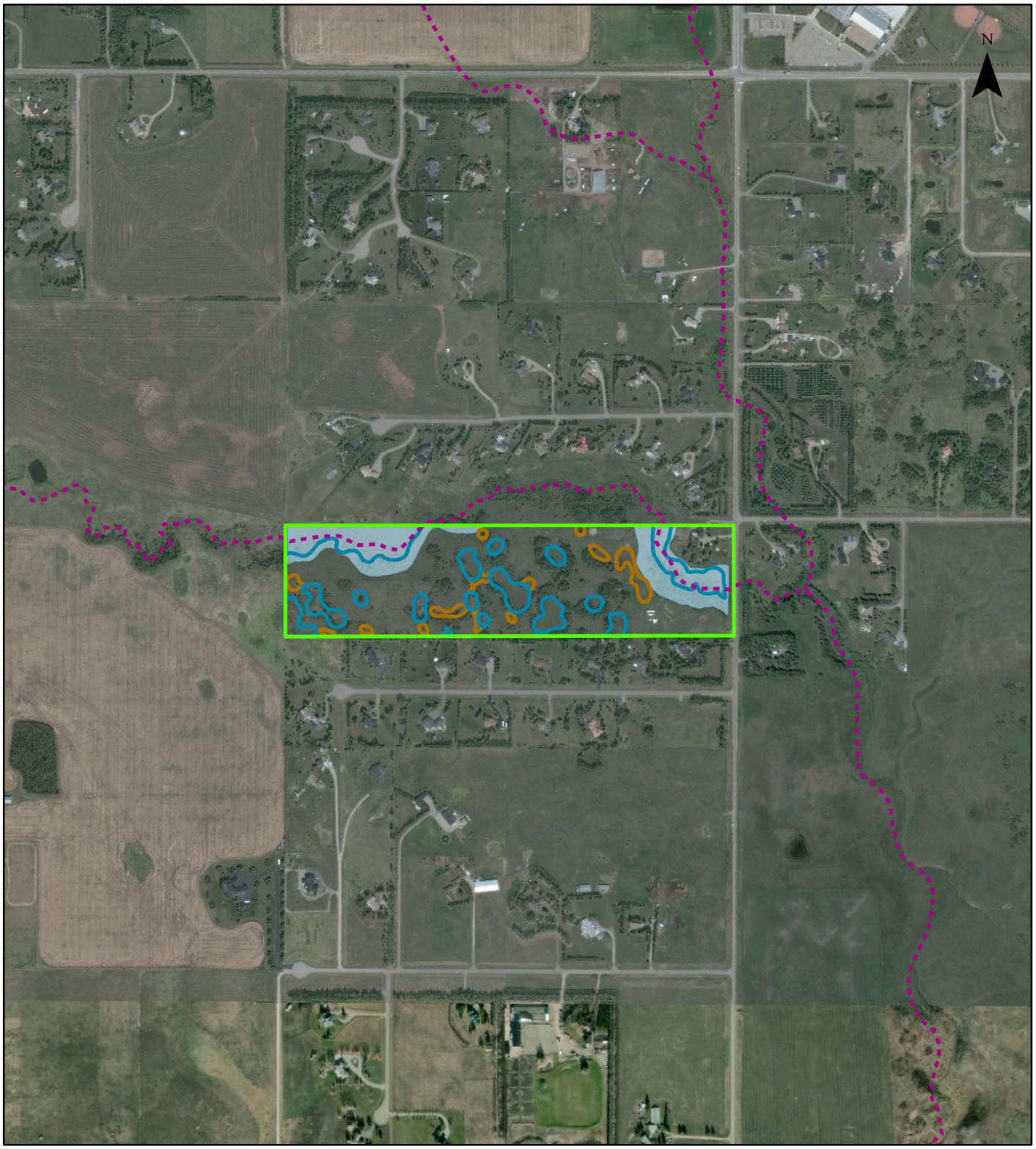
We completed an ACIMS database search, which did not identify any past observations of provincially listed plant species on or in the vicinity of the Project Site. ACIMS database search results are presented in Appendix B.

Rare plant and rare ecological community surveys will be completed in the 2021 growing season.

3.6 Drainage

We identify a drainage running west to east through the Project Site that extends beyond the Site boundaries (Figure 5). The drainage is an upper tributary of Springbank Creek, which meanders through the Site at both the northwest and northeast Site boundaries (See Figures 6, 7, and 8). A culvert under Range Rd. 33 supports drainage southeast of the Project Site (Figure 8).

December field observations of the drainage within the Site indicate the creek exists within a shallow meander belt until it reaches its eastern-most extent, where it forms a steep-sided valley that crosses Range Rd. 33.



LEGEND

- Project Site
- Wetlands
- Ephemeral
- Drainage
- Creek

Imagery Source: ESRI Basemap

Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	DRAINAGE REGIONAL CONTEXT

Date:	Project No.:	Scale:	
03-03-2021	WER121-15	1:10,000	**FIGURE: 5**

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We noted frozen water in the creek on December 7, 2020. Based on the drainage's morphology and the presence of water in winter, we classify it as a Transitional stream. In general, transitional streams usually have small valley bottoms and carry flow year-round but may freeze completely in winter or dry up during periods of drought. The banks and non-vegetated channel are well defined, with channel width greater than 0.4 m to 0.7 m (Alberta Environment and Sustainable Resource Development 2012).

Figure 6: Springbank Creek Tributary

Looking northeast at the west Site boundary showing the meandering creek and associated vegetation (heavy grazing)

Figure 7: Drainage Valley

Looking northwest at the existing conditions of the drainage on the north Site boundary (fence line)

Figure 8: East Creek Boundary

Looking northwest at east Project Site Boundary with Creek drainage under Range Rd 33 in a forested valley. Note Range Rd 33 culvert on left fence line (Source: Google StreetView)

3.7 Wetlands

3.7.1 Wetland Inventory

We identify 16 wetlands within the Project Site based on our desktop review of historical aerial photographs and historical precipitation data (Figure 9). The total wetland area is 3.44 ha. The wetlands are classified as Temporary to Seasonal graminoid marshes. We also identify 13 ephemeral waterbodies totaling 0.64 ha. During the field reconnaissance on December 7, 2020, we noted disturbance of all waterbodies from livestock, namely through vegetation grazing and pugging of waterbody substrate.

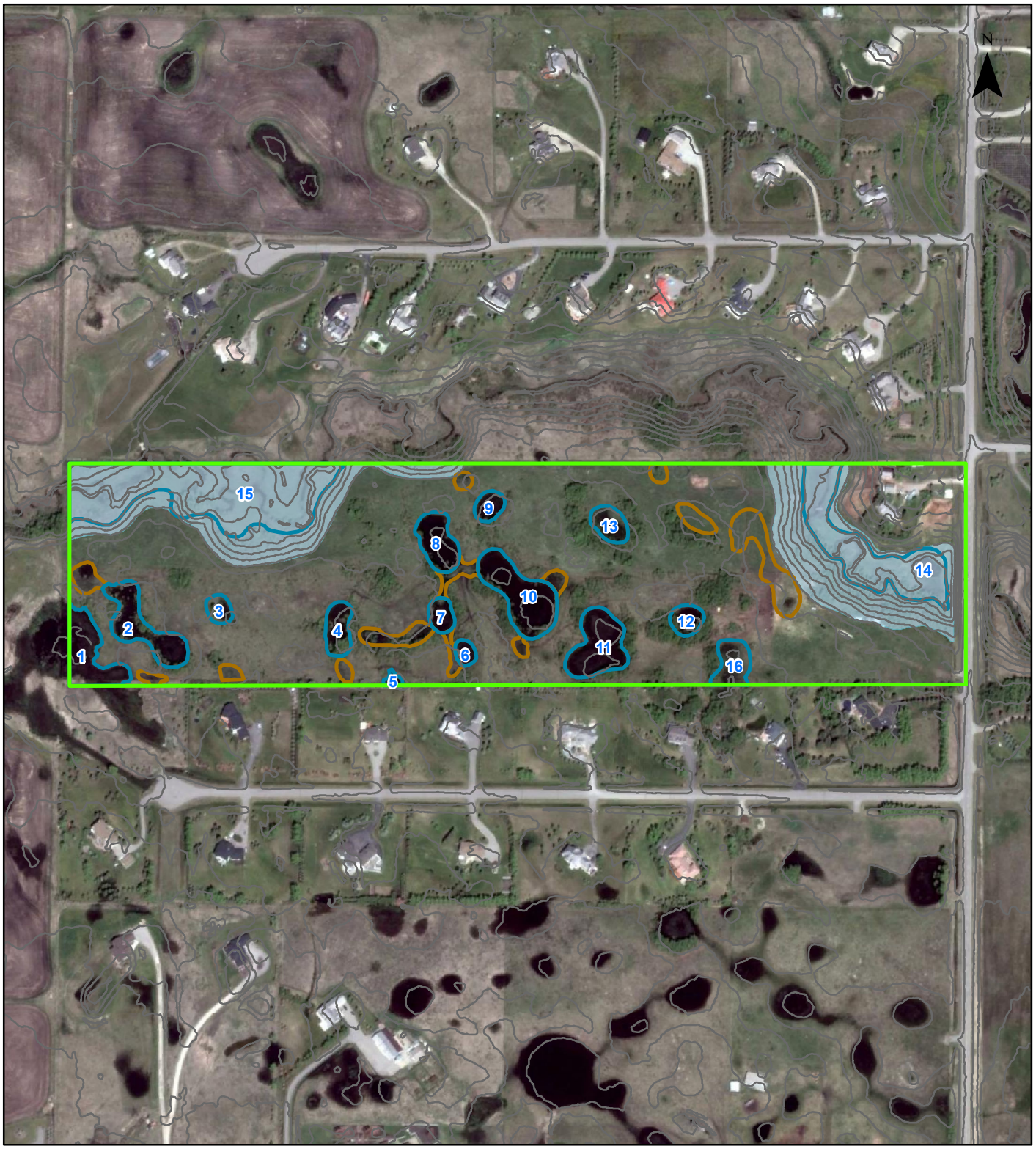
Wetland conditions exist along the creek and are represented by Wetlands 14 and 15.

A summary of Project Site wetlands and water bodies is presented in Table 2. All wetland areas and classes will be verified during field surveys in the growing season (May to September).

Table 2: Desk-top Wetland and Waterbody Area and Classification

ID	Area (ha)	Alberta Wetland Classification	Observed Characteristics		
			Total Years Visible[1]	Years Surface Water Visible[1]	Surface Water Visible in Dry Years[2]
1	0.22	Seasonal Marsh	6	5	3
2	0.23	Temporary Marsh	4	2	2
3	0.05	Temporary Marsh	1	2	1
4	0.10	Temporary Marsh	2	3	2
5	0.02	Temporary Marsh	2	3	1
6	0.03	Temporary Marsh	3	2	1
7	0.06	Temporary Marsh	3	3	2
8	0.15	Seasonal Marsh	5	3	3
9	0.06	Seasonal Marsh	5	4	3
10	0.30	Seasonal Marsh	5	5	3
11	0.24	Seasonal Marsh	5	4	3
12	0.06	Seasonal Marsh	5	4	3
13	0.08	Seasonal Marsh	4	4	2
14	0.58	Seasonal Marsh	7	4	3
15	1.15	Seasonal Marsh	7	4	3
16	0.11	Temporary Marsh	4	3	2

[1]Total number of photographs out of 8 that the water body is visible
[2]Total number of photographs out of 4 that surface water is visible in dry years



LEGEND

Source: Google Earth™

- Project Site
- Drainage
- Wetlands
- Contours
- Ephemeral

Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	WETLAND AND EPHEMERAL WATERBODIES

Date:	Project No.:	Scale:	
02-03-2021	WER121-15	1:5,000	**FIGURE: 9**

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3.7.2 Crown Claimed Water bodies

All Project Site waterbodies were submitted for review at the Water Boundaries Division of Public Lands on February 28, 2021. We are awaiting correspondence from AEP to confirm if any of the waterbodies within the Project Site are claimed by the Crown.

3.7.3 Wetland Hydrology

Existing hydrological conditions are presented in the catchment mapping and waterdrop analysis prepared by Westhoff Engineering (Appendix C). A series of individual sub-catchments are identified within the uplands of the Project Site that surround and support identified wetlands and ephemeral waterbodies. These individual catchments ultimately drain north and east towards Springbank Creek.

3.8 Wildlife

We identify a total of approximately 175 birds, 30 mammals, 4 reptiles, and 5 amphibians that may potentially occur within the Project Site based on species distribution and habitat preferences (Appendix D, includes scientific names). A number of these potential species have been provincially identified and/or federally listed as species of conservation concern.

We completed a 3 km radius database search of FWMIS (Appendix E). The FWMIS database documents the occurrence of six species:

- Baird's sparrow (*Centronyx bairdii*) breeds in native mixed-grass and fescue prairie (Cornell University 2017). Some hayfields or pastures may support Baird's Sparrow where native grasses occur in sufficient quantity, but generally cultivated land is inferior habitat relative to true prairie (The Cornell Lab of Ornithology 2019). Habitat for Baird's sparrow is potentially present in the grasslands within the Project Site. The Baird's sparrow is listed as Sensitive under the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).
- Cougars (*Felis concolor*) prefer remote, wooded, and rocky areas generally in the mountain and foothill regions for habitat (Alberta Environment and Parks 2014). Although FWMIS records a citing of cougar in the broader region, such sightings are expected to be relatively rare. Core habitat areas for cougars are expected to be in more remote locations outside of the residential landscape. Cougars are listed as Secure under the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).
- Grasshopper sparrows (*Ammodramus savannarum*) are found in grasslands, prairies, and open pastures. They prefer open areas with little scrub cover (The Cornell Lab of Ornithology 2019). Habitat for grasshopper sparrows is available within the Project Site. The grasshopper sparrow is listed as Sensitive under the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).
- Great blue herons (*Ardea herodias)* prefer freshwater or saltwater habitats where they hunt fish, amphibians, small mammals, insects, and other birds (The Cornell Lab of Ornithology 2019). Habitat for the great blue heron may be present within creek

drainage. The great blue heron is listed as Sensitive under the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).

- Least flycatchers (*Empidonax minimus*) are most commonly found in deciduous and mixed forests. Nesting takes place in deciduous trees (The Cornell Lab of Ornithology 2019). Habitat for least flycatcher is available within the Project Site. The least flycatcher is listed as Sensitive under the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).
- Western wood-pewee (*Contopus sordidulus*) prefer open woodlands, forest edges, and forests near streams. They commonly use forests with larger trees, open understories, and standing dead trees (The Cornell Lab of Ornithology 2015). Habitat for the western wood-pewee is available within to the Project Site. The western wood-pewee is listed as May Be at Risk under the General Status of Alberta Wild Species (Alberta Environment and Parks 2015).

3.9 Landscape Connectivity and Wildlife Movement

Landscape connectivity is a scientific term that refers to the degree to which a landscape facilitates or impedes the movements of organisms among resource patches (Taylor, et al. 1993). In other words, landscape connectivity refers to the degree to which a landscape functions to provide organisms, such as wildlife, access to preferred habitats. Physical landscape connections between habitat patches can either be corridors (a strip of land connecting habitat patches) or steppingstones (small habitat patches in a row) (Forman 1995).

We describe landscape connectivity based on the extent of connected natural habitats present within and adjacent to the Project Site. On a regional scale, the Project Site is surrounded by country residential and agricultural land, with some residual natural landscapes and associated drainages remaining. Wildlife are likely to move relatively freely within the Site and surrounding areas. The creek drainage is likely to be used as a travel corridor through the region, however, Range Rd. 33 is a potential barrier and/or a collision hazard for regional movements.

3.10 Environmentally Significant Areas

The Environmentally Significant Areas in Alberta: 2014 Update report identifies Environmentally Significant Areas (ESAs) on a provincial scale (Fiera Biological Consulting Ltd. 2014). We overlaid these provincial ESA map results on the Project Site to determine if all or part of the Site was considered a provincial ESA. There were no pre-determined areas within the Project Site that the Province identifies as an ESA.

The 2014 Update report identifies four general criteria used to assess whether an area is an ESA. The criteria are:

1. Areas that contain focal species, species groups or their habitats;
2. Areas that contain rare, unique or focal habitat, such as natural springs, Class A and B rivers and waterfowl staging areas;

3. Areas with ecological integrity, including undisturbed upland or wetland habitat; and

4. Areas that contribute to water quality.

Based on these criteria, we identify the Creek and associated drainage valley as an ESA.

3.11 Historical Resources

We overlaid the Listing of Historic Resources on the Project Site in ArcGIS. The Listing shows that the Project Site is listed as 5a, which means that the Project Site has high potential to contain historic archaeological resources (Alberta Culture and Tourism 2016). A formal assessment of historical resources is not included as part of this BIA.

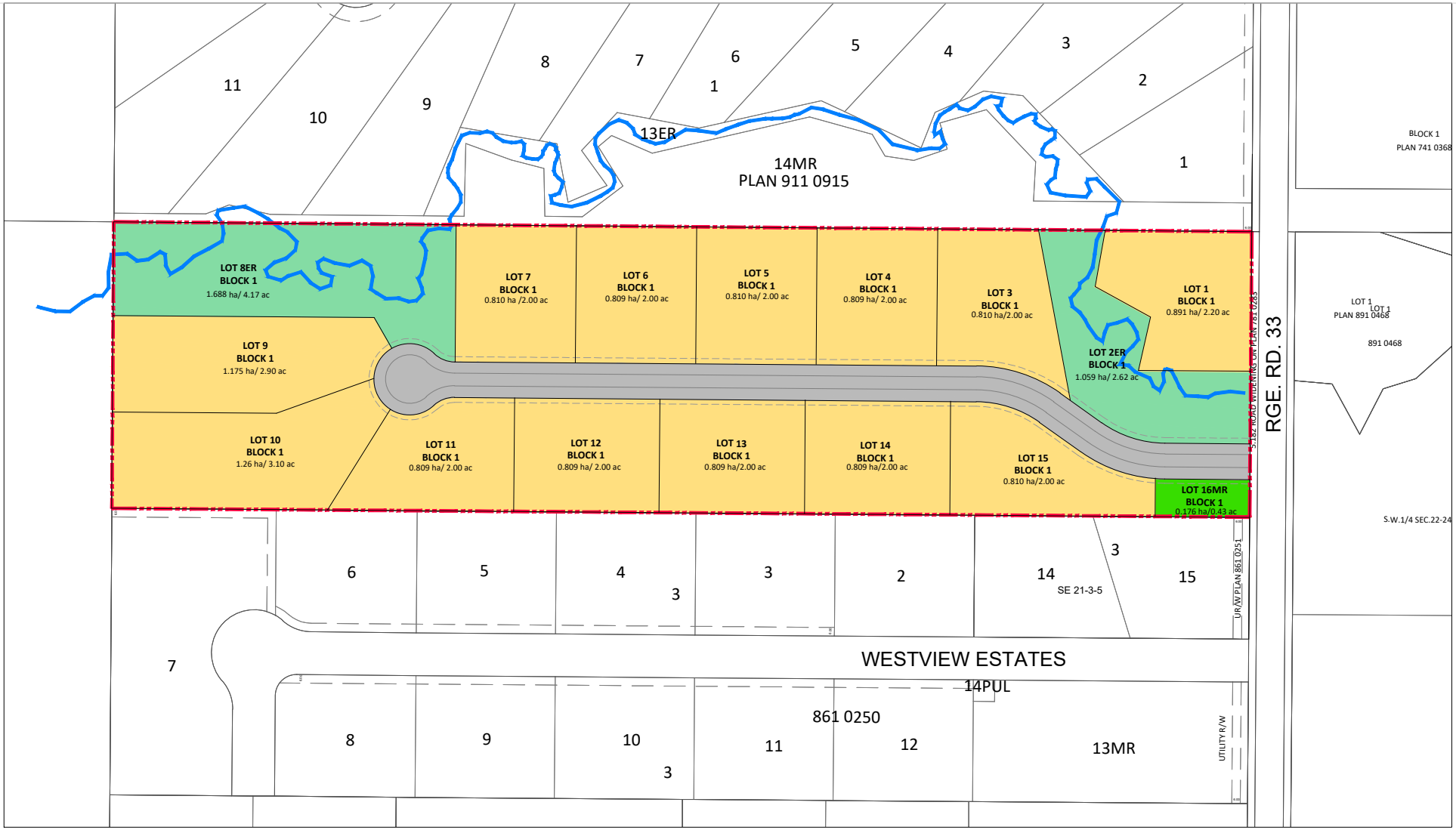
4 Identification of Potential Impacts

The predicted impacts of the Willow Ranch Conceptual Scheme on identified biophysical conditions were determined with reference to the development concept prepared by B&A Planning Group in March 2021 (Figure 10). The approach to Site development involves the designation of building envelopes within which individual residences and associating access and infrastructure are to be constructed. The intent is to encourage retention of remaining natural areas outside each building envelope, such as forest stands, wetlands, and ephemeral waterbodies.

The Willow Ranch Conceptual Scheme proposes an infill country residential neighborhood that incorporates the dedication of Environmental Reserve (ER) and an associate Environmental Reserve Easement (ERE) to preserve Springbank Creek and related low-lying lands, which we identify as an Environmentally Significant Area (ESA). ERE is also dedicated in the southwest corner of the Plan, in an area prone to seasonal inundation. The dedication of ERE is in accordance with Section 664*(2)* of the *Municipal Government Act.*

The emphasis of stormwater management is on Low Impact Development (LID) measures to be incorporated within individual lots. Various measures may be applied, for example, absorbent soils, bio-swales, bio-retention, and the use of stormwater for irrigation of landscaped areas. The intent is to mimic pre-development conditions implementing volume controls through on-site measures and facilitating drainage through natural routing, where possible. Stormwater management targets are consistent with the permissible stormwater release rate, which is 1.7 l/s/ha and a runoff volume control target: 70 mm or 230 m^3/ha.

A summary of the potential impacts of the proposed development and recommended mitigation measures are presented in Table 3. Mitigation measures are described in further detail in Section 5.



Subject Lands
Existing Creek
Residential Area
Municipal Reserve (MR)
Environmental Reserve (ER)

N

1:4000

Mar 17, 2021 - 11:22am W:\2102-12_Richard Lindseth_Willow Ranch CS_LUA\5.0 Technical\5.1 Technical Production\5.1.1 AutoCAD\2102-12 Revised plan_March 17, 2021.dwg Layout:Fig Concept

b&a

Willow Ranch Conceptual Scheme

Development Concept

Block 1 & 2, Plan 811 1225

March 2021

Table 3: Summary of Potential Impacts

Environmental Component	Potential Impact	Mitigation Measures
Soils/terrain/ hydrology	• Local loss of soil from removal, erosion and/or admixing during construction • soil compaction from heavy equipment used during construction • sediment runoff to retained waterbodies and surrounding areas • accidental spills of fuels, chemicals, and other potentially hazardous materials • modification of drainage patterns	• Implementation of Erosion Sediment Control (ESC) Plan • Environmental Protection Plan (EPP) documentation of mitigation measures for construction. • Retention of the Springbank Creek drainage, associated wetland area and protective environmental setback • Topsoil shall be salvaged and re-used in landscaping • Vehicle and equipment traffic will be restricted to designated access routes/areas to minimize impact on surrounding area • Stormwater management strategies will be implemented to manage run-off and erosion and maintain pre-development flows to Springbank Creek.
Upland Vegetation	• Local loss of upland vegetation, including deciduous forest areas in the uplands, where needed to facilitate building envelope development • accidental spills of fuels, chemicals, and fertilizers during construction and community residence • introduction and spread of weeds or other invasive plants during construction and community residence	• Where possible, retention of the upland deciduous forests • Implementation of Erosion Sediment Control (ESC) Plan • Environmental Protection Plan (EPP) documentation of mitigation measures for construction. • Implementation of Weed Management Plan • All construction equipment to be cleaned and inspected prior to arrival on site • Introduced Site construction and revegetation materials will be certified weed-free
Wetlands	• Local loss of wetlands and ephemeral waterbodies within individual loots • disturbance of wetland conditions in the drainage from surface run-off. • loss or alteration of retained wetland vegetation and habitat due to accidental spills of fuels, chemicals, and other hazardous materials	• Where possible, retention of local wetlands and ephemeral waterbodies within individual lots • Retention of the drainage and associated wetlands • Designation of an environmental setback adjacent the Creek • Implementation of Erosion Sediment Control (ESC) Plan • Environmental Protection Plan (EPP) documentation of mitigation measures for construction.

Environmental Component	Potential Impact	Mitigation Measures
	• disturbance of wetland margin from post development recreational activities	• Stormwater management strategies will be implemented to manage run-off and erosion and maintain pre-development flows to Springbank Creek • Designated trails and educational signs along drainage boundary
Watercourse	• erosion due to surface run-off • loss or alteration of retained wetland vegetation and habitat due to accidental spills of fuels, chemicals, and other hazardous materials • possible changes to water quality and quantity	• retention of drainage and associated watercourse and wetlands • Erosion Sediment Control (ESC) Plan • Environmental Protection Plan (EPP) documentation of mitigation measures for construction. • Designation of an environmental setback adjacent the Creek • Stormwater management strategies will be implemented to manage run-off and erosion and maintain pre-development flows to Springbank Creek • Educational signs along drainage boundary
Wildlife	• damage, disturbance, or loss of individual wildlife species and their residence (active nests and burrows) • temporary and long-term sensory disturbance, barriers to movement and habitat avoidance by wildlife • changes in diversity towards species more tolerant of human activity • accidental spills of fuels, chemicals, and other hazardous materials resulting in loss or alteration of habitat • wildlife-human conflicts due to wildlife attractants (e.g., bird seed, food, garbage)	• Time construction to avoid critical periods for wildlife • Retention of the drainage and designation of an environmental setback adjacent the Creek • Designated trails and educational signs along drainage boundary • Landowner's manual for wildlife-human conflict resolution

4.1 Impacts to Soils and Terrain

The approach to development is to maintain, where possible, existing grades and landforms. However, there will be some local stripping and grading to accommodate individual building footprints. Though much of the landscape will remain in a natural state, there will be some impervious surfaces introduced in building footprints that will alter surface drainage patterns. Surface water quality may also be affected through run-off from residential sites. Accidental spills of fuels, chemicals, and other hazardous materials during construction and operation may result in contamination of soils.

4.2 Loss or Alteration of Plants and Plant Communities

Much of the existing natural vegetation will be retained, where possible, while some local clearing of deciduous forest may occur within building development footprints. No loss or alteration of vegetation within the drainage is expected provided stormwater management strategies are implemented and construction avoids the drainage and the associated environmental setback. Accidental spills of fuels, chemicals, and other hazardous materials may result in contamination and/or loss of vegetation.

Weeds or other invasive plants may be introduced to the Project Site on equipment or through wind dispersal. Weed invasion may lead to the alteration of existing natural vegetation communities, reducing overall species diversity.

4.3 Loss of Wetlands

Wetlands and waterbodies within individual lots may be subject to loss or alteration as a result of development within building footprints and from associated landscaping activities. Wetland conditions within the drainage may be impacted if the quality of surface runoff is poor due to sedimentation or the introduction of contaminants from residential areas. Surface water contamination of all waterbodies may also occur as a result of accidental spills of fuels, chemicals, and other hazardous materials during construction and residential occupation.

4.4 Alteration of the Drainage and Creek

The drainage and associated creek will be retained but may potentially be impacted through surface runoff unless proper erosion and sediment controls as well as stormwater management strategies are applied.

4.5 Loss or Disturbance of Wildlife and Wildlife Habitat

Wildlife habitat available within the Project Site will be altered as a result of Site development reducing the overall availability and suitability for species inhabiting the area. However, habitat will be retained within the drainage and associated environmental setback, while residual habitat may be retained within individual lots.

The proposed construction activities may result in local sensory disturbance and damage or disturbance of individual wildlife species and their residences (active nests and/or burrows). This

potential impact is of particular concern during the breeding season, which for many species is between approximately April 1 and August 31. This sensitive time period will vary based on yearly shifts in climatic conditions. Damage or harassment of certain species is prohibited under the Migratory Birds Convention Act (Government of Canada 1994), the Species at Risk Act (Government of Canada 2002) and the Alberta Wildlife Act (Government of Alberta 1997).

4.6 Landscape Connectivity and Wildlife Movement

The proposed development will result in some local loss of landscape connectivity for terrestrial wildlife that may travel through the local area. However, the corridor of open space along the drainage will be retained and is likely to support continued wildlife movement through the Site, especially for species more tolerant of human activities.

5 General Mitigation Measures

Mitigation measures are measures applied to eliminate, reduce, or control the predicted negative impacts of a particular project (Government of Canada 2012). Mitigation measures for natural landscape features within the Project Site are presented below.

5.1 Erosion and Sediment Control

Erosion and Sediment Control (ESC) planning will be developed as per current Rocky View County or equivalent guidelines. The design and implementation of site-specific erosion and sediment control measures is recommended prior to, during, and following the completion of each phase of the proposed development.

5.2 Environmental Protection Plan

Environmental Protection Plan (EPP) Best Management Practices will be prepared as per Rocky View County or equivalent guidelines. BMPs will include vegetation protection, dust control measures, management of mud-tracking off-site, designated stockpile storage, designated re-fueling areas, waste management and recycling. BMPs will be identified and implemented prior to construction.

5.3 Landscape Plan and Weed Management Program

Where possible, any landscaped open space will reflect the Natural Subregion and associated plant species and communities. Weed management activities will be implemented as per the Weed Control Act Regulations (Government of Alberta 2010). Any problem species (Prohibited Noxious or Noxious) will be managed to current standards using recommended prescriptions of mechanical, chemical, or biological controls. Chemical control of invasive plants will follow the Environmental Code of Practices for Pesticides (Government of Alberta 2010).

5.4 Rare Plants and Rare Ecological Communities

In the event that any rare plants or rare ecological communities are identified within the Project Site, mitigation measures to conserve the species or community will be identified in a Mitigation Plan.

5.5 Stormwater Management Strategies

Stormwater management strategies are provided by Westhoff in a separate concept plan for the development.

5.6 Environmental Setback

An Environmental Setback will be designated adjacent the Creek to provide protection to the drainage and its associated vegetation and wetlands (Figure 11). The setback width was determined through spatial analysis prepared by Rocky View County. Westhoff applied the Rocky View County shapefile and made small adjustments to the setback line in localized areas to accommodate steeper slopes associated with drainage.

The setback varies from approximately 25-60 m in width. We anticipate that the Environmentally Sensitive Area identified as the Creek and drainage will be effectively protected by the designated Environmental Setback.

Educational signage is recommended within the Setback to communicate the purpose and function of the Setback in protecting the Creek drainage. Access controls may take the form of designated trails to reduce the development of informal access routes.

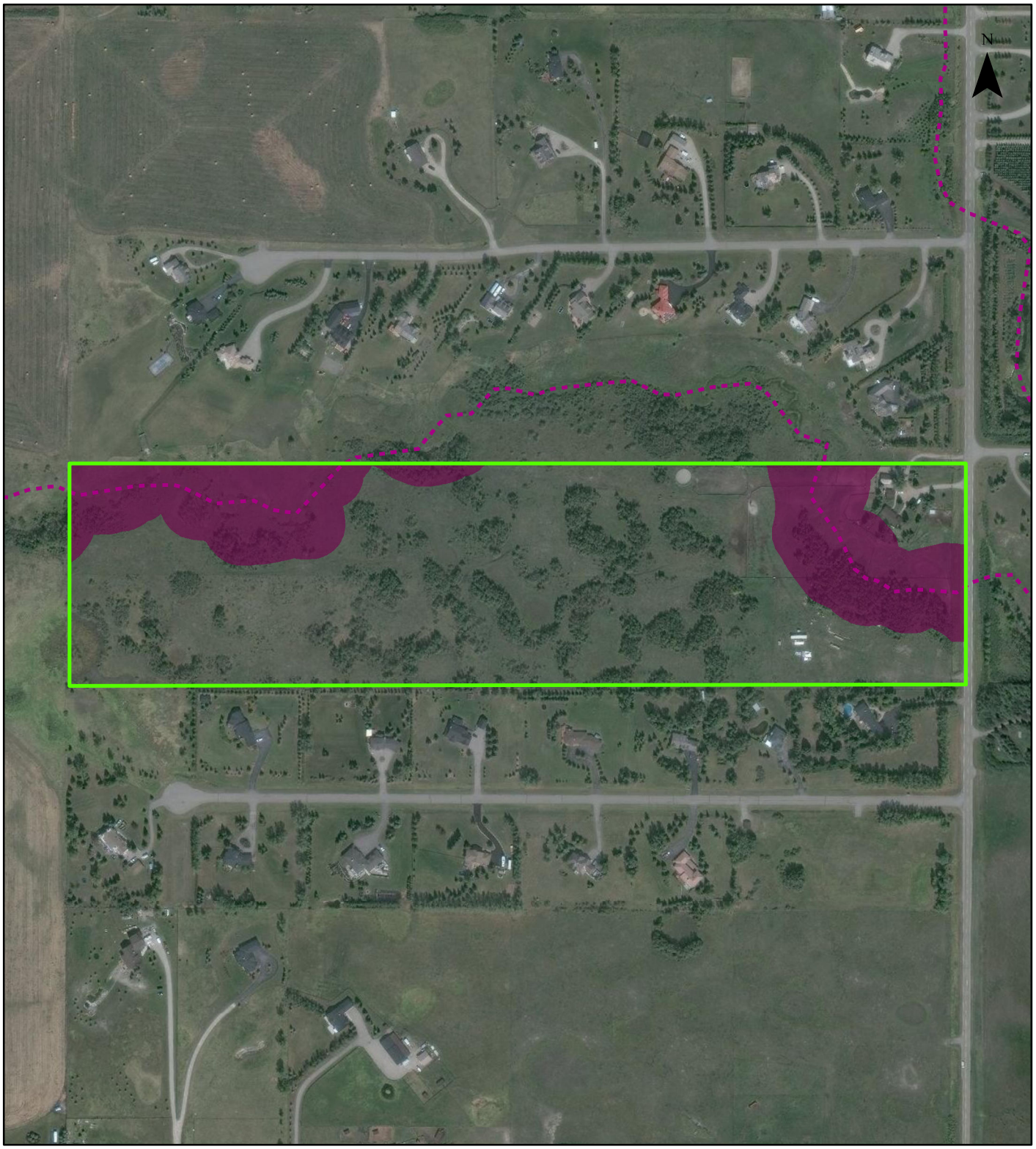
5.7 Landowner's Manual

We recommend that a Landowners' Manual be prepared and provided to residents of this new community. The Manual will include information on the sensitivity of the natural landscapes surrounding the development and what area residents can do to maintain these areas over the long-term. The manual will include guidelines for appropriate landscaping, weed control and avoiding damage to the riparian zone (e.g., no mowing or dumping of garden waste).

Wildlife-human conflicts are a potential impact associated with the development. The Owners' Manual would provide information on avoiding conflicts with bears, cougars, or other wildlife primarily through effective attractant management.

5.8 Timing of Construction

We recommend that construction activities, in particular tree or brush removal, be completed outside the critical time period for many wildlife species: approximately April 1 to August 31 (Environment Canada 2014). This is the primary breeding period for many wildlife species that may be encountered within the work site (Stebbins 2003, Smith 1993, McGillivray and Semenchuk 1998).



LEGEND

- Project Site
- Environmental Setback
- Creek

Imagery Source: ESRI Basemap

Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	ENVIRONMENTAL SETBACK

Date:	Project No.:	Scale:	
03-03-2021	WER121-15	1:5,000	**FIGURE: 11**

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Land & Water Resources Management Consultants

Nesting can be influenced by micro-climatic conditions in specific areas as well as inter-annual variation due to factors such as an early spring or cold, wet summer (Environment Canada 2014). Therefore, this nesting period may vary by Project location.

If construction is to take place within the April 1 to August 31 period, a pre-construction wildlife survey will be completed. The wildlife survey will support the avoidance of sensitive wildlife features including active burrows or nests. The following steps should be followed:

1. A qualified biologist will complete the survey of the area four days prior to any activities commencing.
2. If active breeding activity is observed, no construction activities using heavy machinery can occur until mitigation measures are applied. These mitigation measures may include a construction setback designated around the breeding site. The Canadian Wildlife Service will be consulted to determine the required width of the setback.
3. The construction setback will be in effect as long as breeding activity occurs.
4. If construction stops for four or more consecutive days, the area will be surveyed again for active breeding activity before commencing works with heavy machinery.
5. A qualified biologist will re-survey the area to determine if breeding activity is still present.
6. Once breeding activity is no longer present, the setback can be removed, and construction activities can begin.

This surveying will facilitate compliance with the Migratory Birds Convention Act (Government of Canada 1994), the Species at Risk Act (Government of Canada 2002), and the Alberta Wildlife Act (Government of Alberta 1997).

5.9 Monitoring

A monitoring program will be initiated during construction to document the implementation and success of the ESC and EPP planning initiatives.

6 Wetland Mitigation Measures

6.1 Wetland Decision Framework

Where possible, wetlands will be retained within individual lots. However, some wetlands may be altered or removed as a result of development within local building footprints. The area of wetland loss from individual lots will be determined at the stage of development permit application.

Alberta Environment and Parks requires that proponents of development provide a rationale for why wetlands cannot be avoided. Referring to the Alberta Wetland Mitigation Directives (Alberta Environment and Parks 2015), we note the following:

- no wetlands within the Project Site uplands and building envelopes are claimed by the Crown under the Public Lands Act;
- the Project Site is not located within lands designated under the *Provincial Parks Act*, *Wilderness Areas*, *Ecological Reserves*, *Natural Areas and Heritage Rangelands Act* and the *Willmore Parks Act*;
- there are no records of any wetland-dependent species in the wetlands that are listed as endangered species under the *Wildlife Act*, *Wildlife Regulation* (Schedule 6) or the *Species At Risk Act*;
- there are no known conflicts in regard to wetland management objectives within the Alberta Land Stewardship Act Regional Plans or nested Sub-Regional Plans; and
- there are no known conflicts in regard to wetland management objectives within any other statutory plan or legislation.

6.2 Wetland Replacement Strategy

All wetlands that may be lost as a result of development will be compensated for (i.e. in-lieu replacement payment) through standard procedures under the provincial *Water Act*. The ephemeral water bodies are not subject to compensation or in-lieu replacement fees and are therefore not included in the replacement strategy.

7 Residual Impacts and Significance

We predict that the proposed development will have residual impacts after the above mitigation measures are implemented. These residual impacts are the loss of upland forests, wetlands, and individual wildlife.

7.1 Upland Deciduous Forest

The proposed development will result in the permanent loss of some deciduous forest within identified building envelopes. At the time this BIA was prepared, there was no formal process, or available provincial or municipal criteria, for determining what qualifies as a significant residual loss of native vegetation. Losses are expected to be local and negligible with community emphasis on maintaining the area in a natural state. We conclude that no significant residual impacts are predicted as a result of the anticipated local loss of deciduous forest provided the majority of these forests are retained combines with the protection of forest cover in the drainage.

7.2 Wetlands

Wetlands may be permanently lost or altered as a result of the proposed development. Wetland loss will be mitigated by providing wetland replacement through existing provincial approval processes under the Alberta Wetland Policy. Wetland replacement is an accepted approach to managing loss of wetlands on both provincial and municipal scales.

At the time this report was prepared, there were no available provincial or municipal criteria for determining what qualifies as a significant residual impact to wetlands. We conclude this residual impact to wetlands is not significant provided wetland loss is off set through applying Alberta Wetland Policy replacement strategies.

7.3 Wildlife

Timing the stripping and grading activities to occur outside the sensitive breeding season for most wildlife will significantly reduce the risk of wildlife fatality but will not eliminate it. The loss of a listed species due to stripping and grading would be a significant residual impact.

We expect the fatality risk to listed species is negligible given the low quality of available habitat and given that stripping and grading will occur outside the breeding season or only after active nest/burrow sweeps are completed and associated Best Management Practices are implemented.

8 Description of Cumulative Effects

Cumulative effects are the changes to the environment caused by all past, present, and reasonably foreseeable future human activities (Alberta Environment 2018). The information and resources available for this study do not permit the assessment of cumulative impacts of the Project to be undertaken using “best practice” Cumulative Effects Assessment (CEA) methodology (Hegmann, et al. 1999). Some preliminary assessment is possible, and the following description of cumulative effects is presented in this light.

Our approach to the identification and description of potential cumulative impacts adopts elements of CEA by first selecting Valued Ecosystem Components (VECs) that we expect may be sensitive to these impacts. A VEC is defined as any part of the environment that is considered important by the proponent, public, scientists or government. The importance of a VEC may be determined on the basis of cultural values or scientific concern (Hegmann, et al. 1999).

Wetlands are recognized federally as a VEC because of their important ecological functions and associated socio-economic values (Hanson, et al. 2008). The Alberta Wetland Policy emphasizes the conservation, restoration, protection, and management of wetlands to sustain the benefits they provide (Alberta Environment and Parks 2013). The cumulative effects of rapid population and economic growth in Alberta have been the loss and degradation of two thirds of the wetlands in settled areas of the Province (Alberta Environment and Parks 2013).

Wetland losses may be incurred as a result of the proposed Willow Ranch development. To date, the cumulative effects of development on wetlands have been mitigated primarily through the Alberta Wetland Policy wetland replacement program. Overall, we anticipate that the cumulative effects on wetlands in this region will be managed through the retention of priority wetlands outside the Project Site coupled with the application of provincially approved wetland replacement measures.

We also identify Environmentally Significant Areas as VECs for the purpose of this cumulative effect's evaluation. Any development within Rocky View County that results in the loss of an ESA we expect would contribute to a potential adverse cumulative effect on natural landscapes in the region as whole. The retention of the identified ESA within the Project Site supports the conclusion that no significant cumulative effects are expected as a result of the proposed development.

9 Follow-Up Activities

Field surveys in the growing season were not included as part of this BIA. These surveys will be completed in the spring of 2021 and will be submitted as supplementation information to Rocky View County.

10 References

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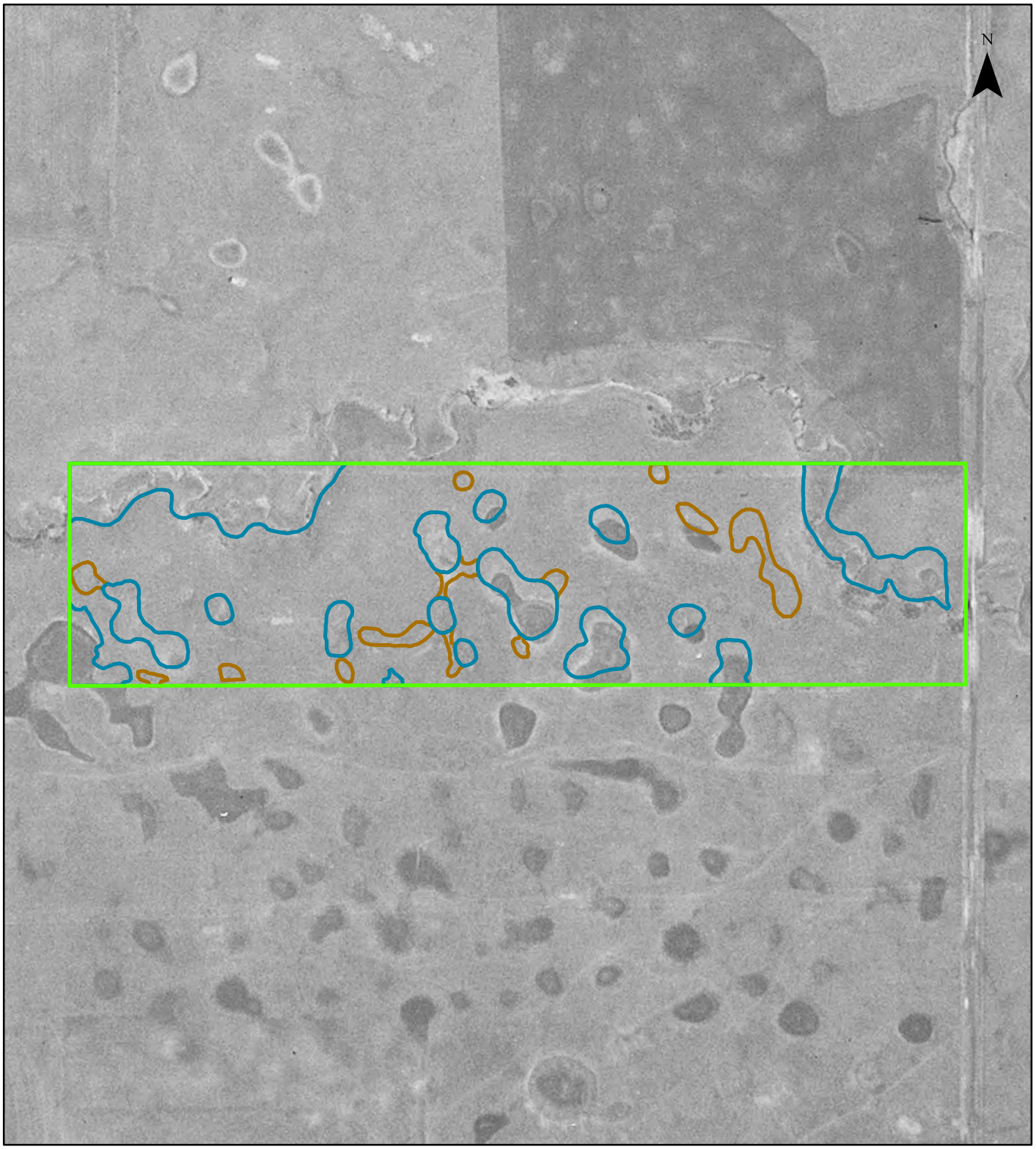
Appendix A Historical Aerial Photographs



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: AEP

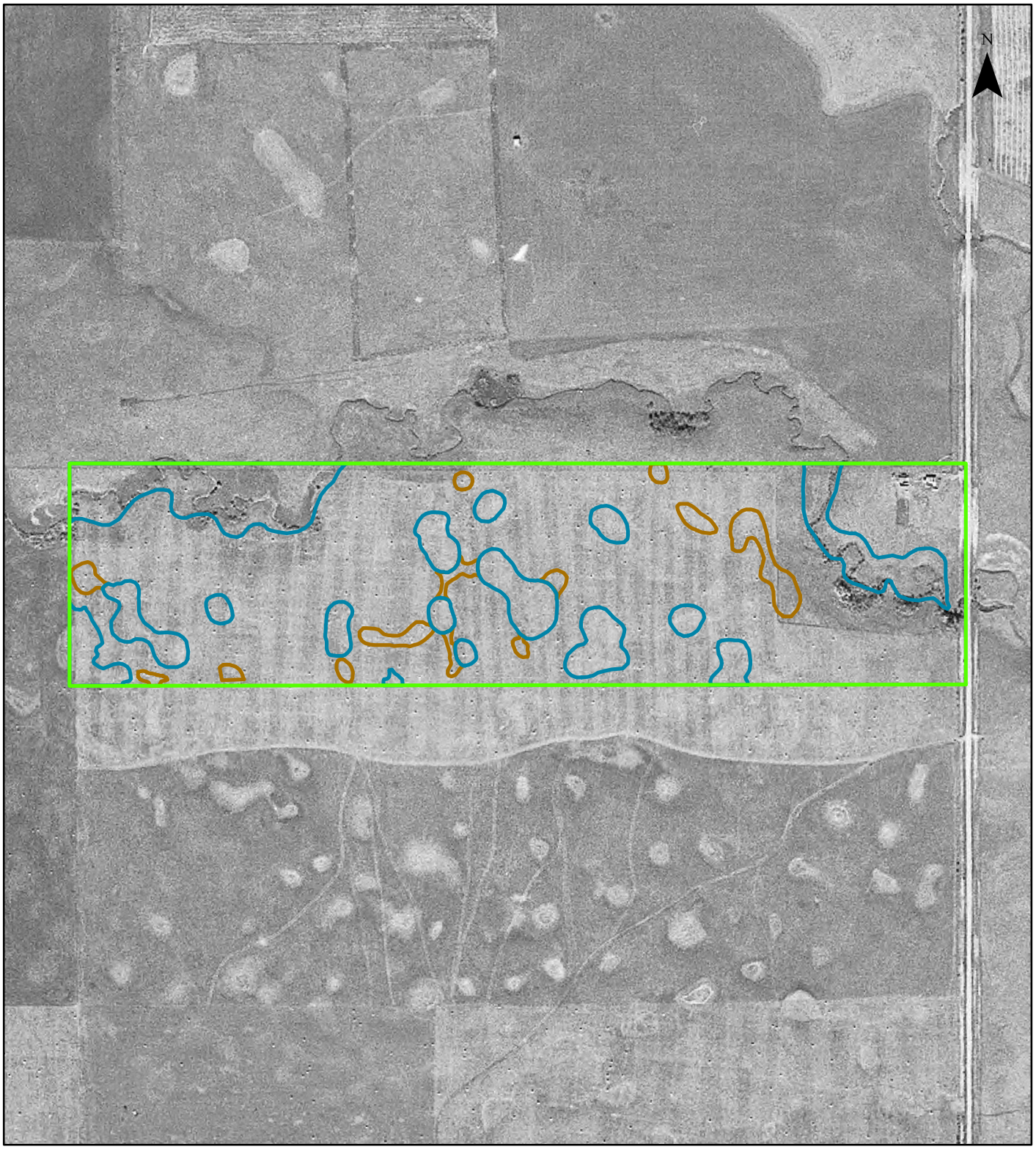
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	JUNE 9, 1950

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: AEP

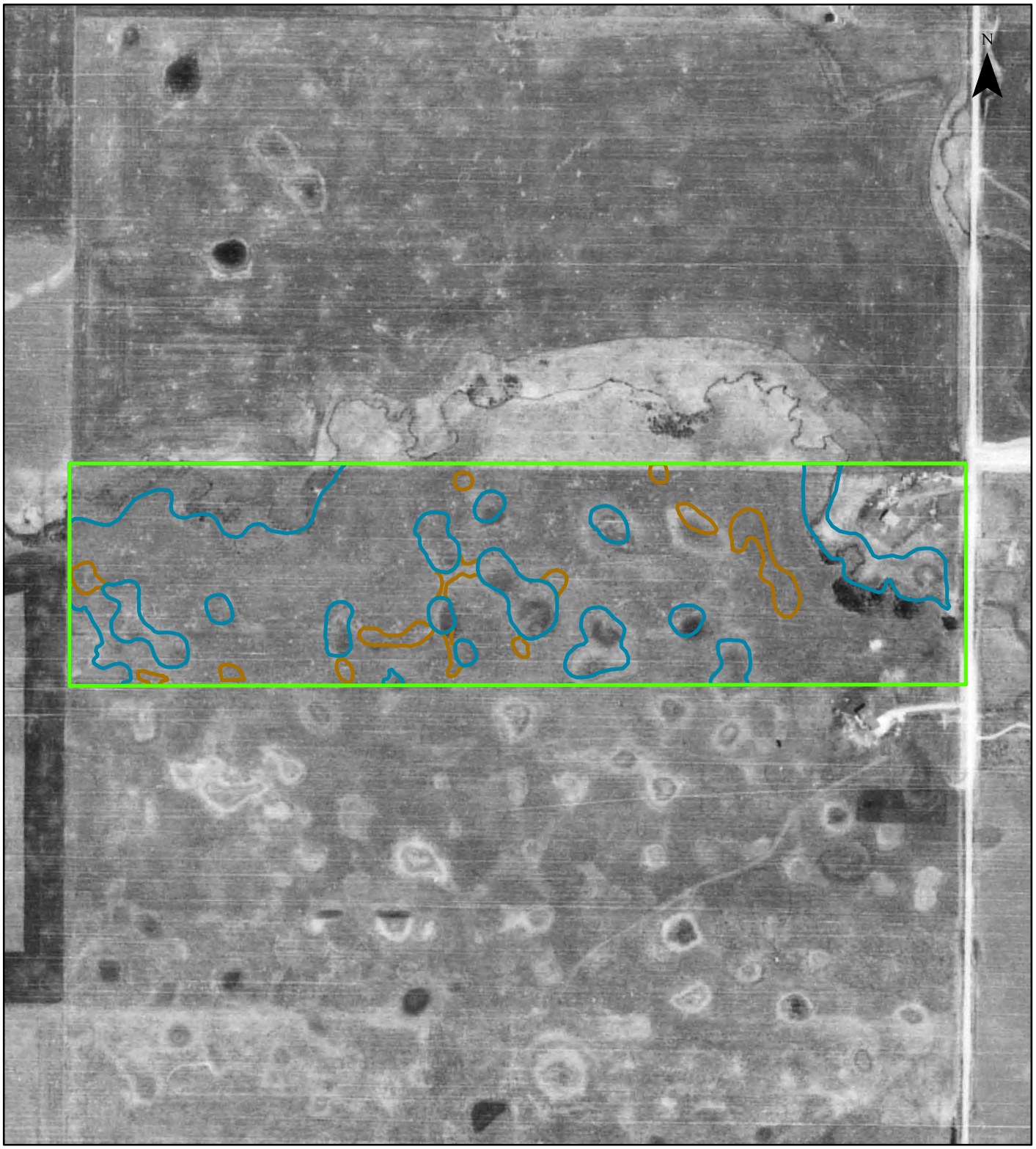
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	SEPTEMBER 19, 1962

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: AEP

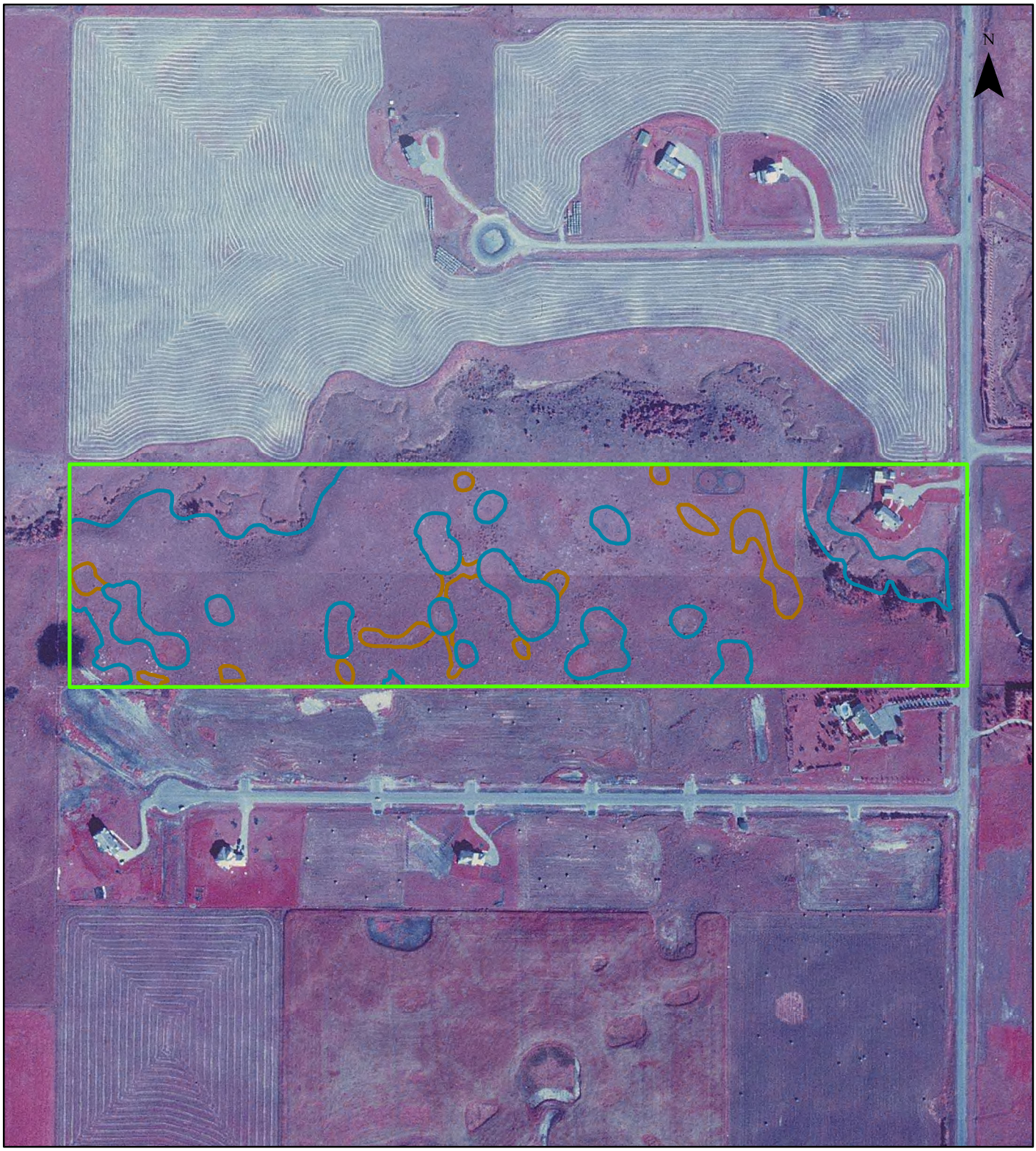
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	JUNE 12, 1974

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: AEP

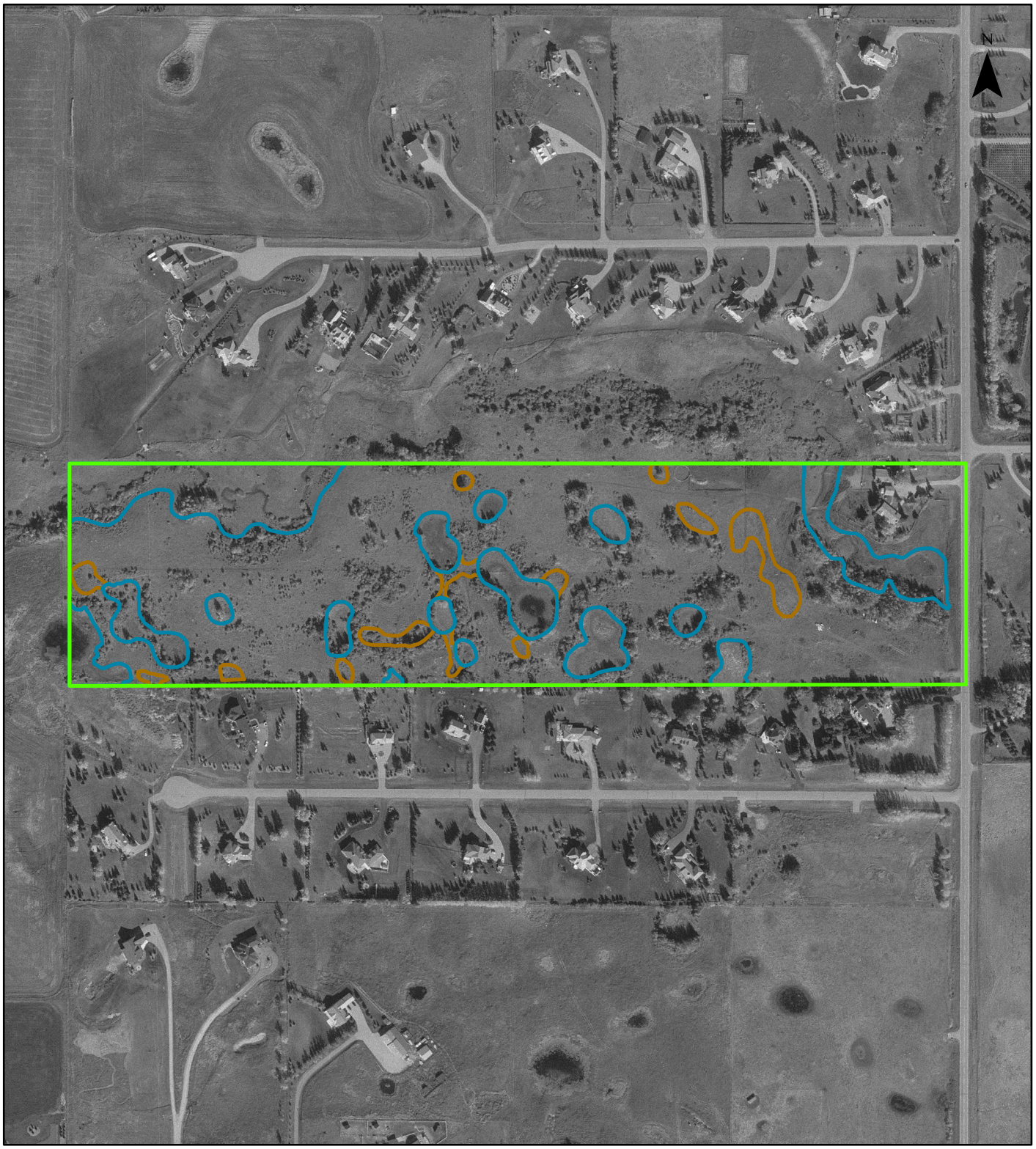
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	SEPTEMBER 17, 1987

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: AEP

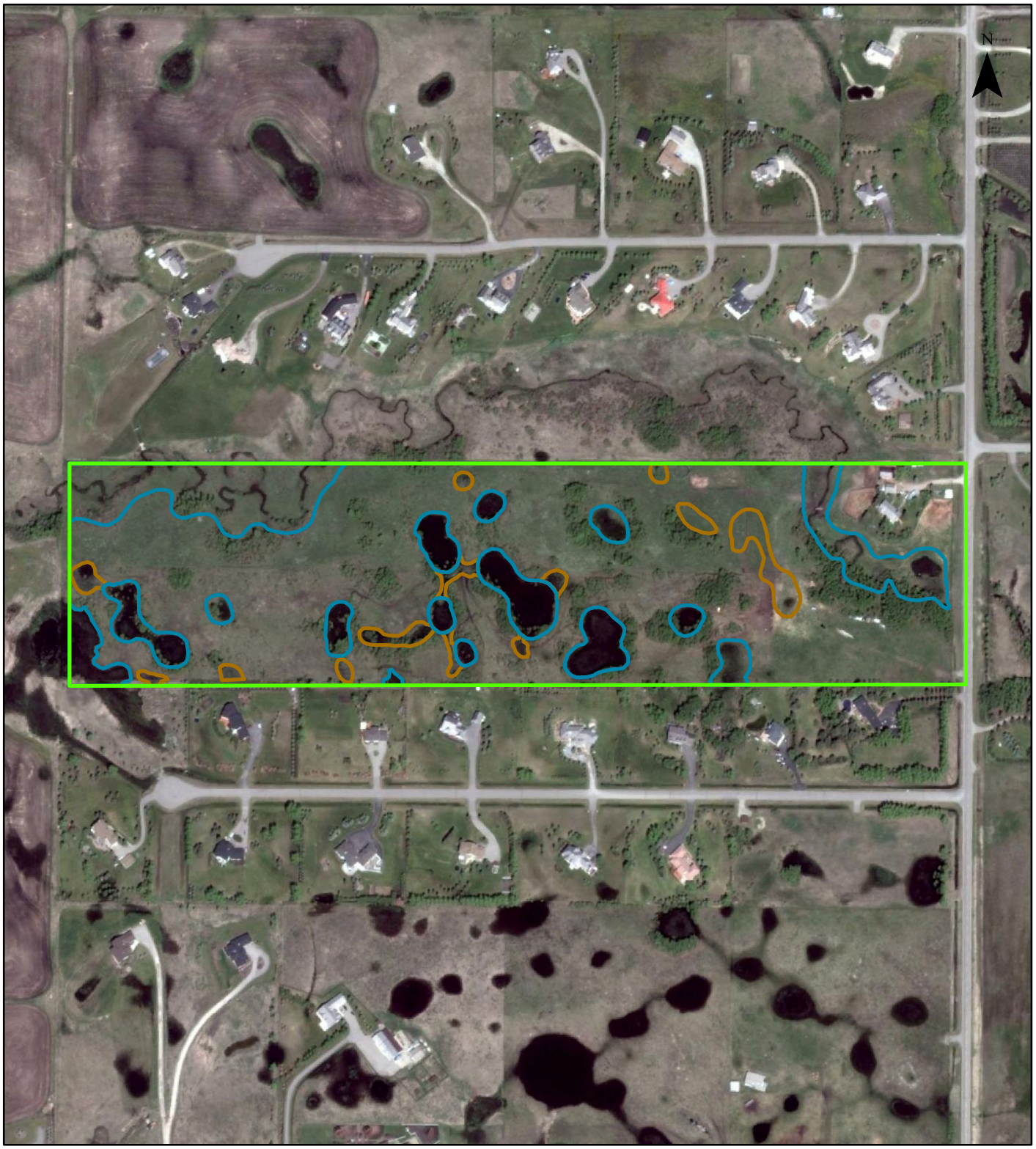
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	SEPTEMBER 28, 2008

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: Google Earth™

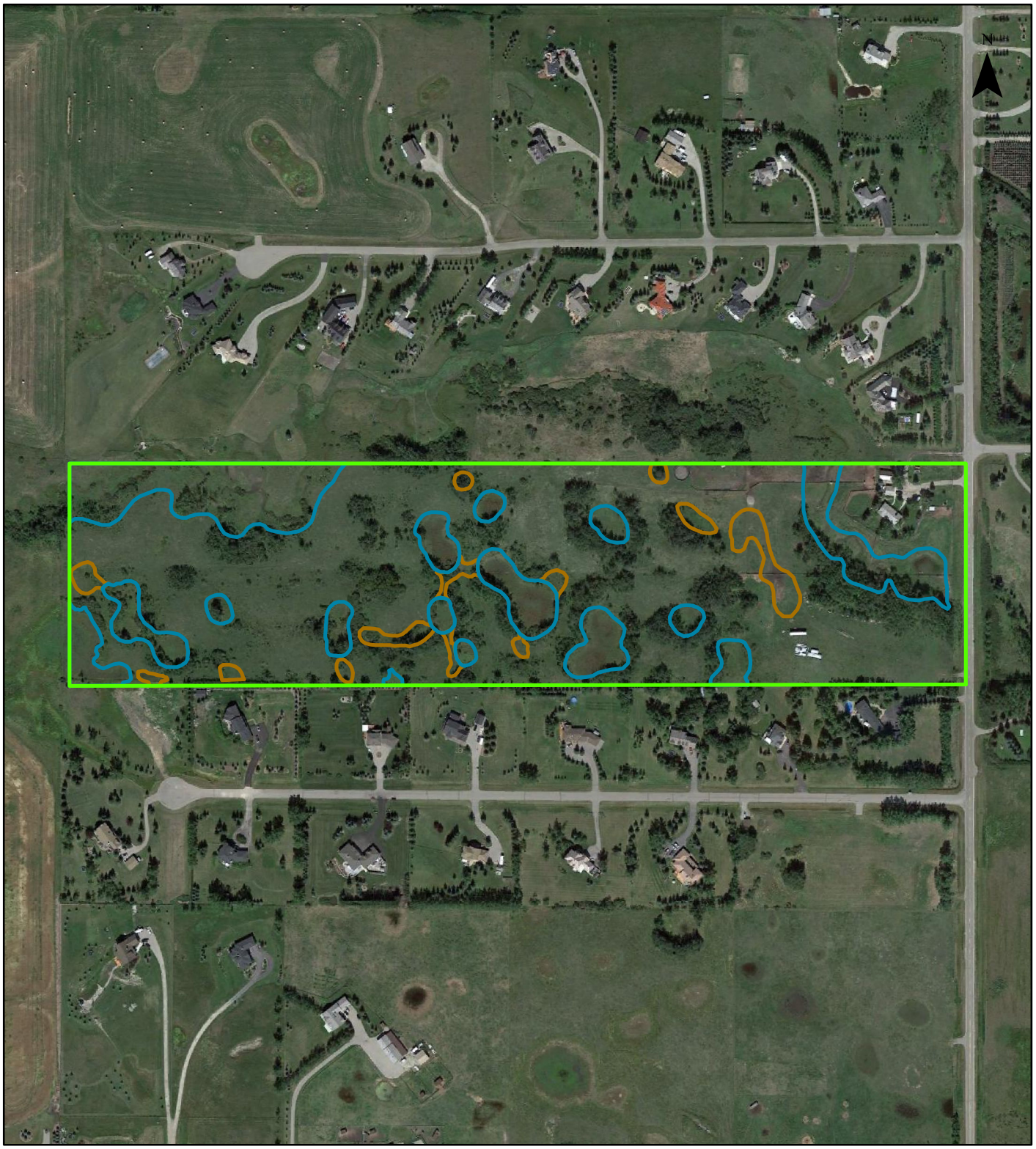
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	JUNE 8, 2011

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: Google Earth™

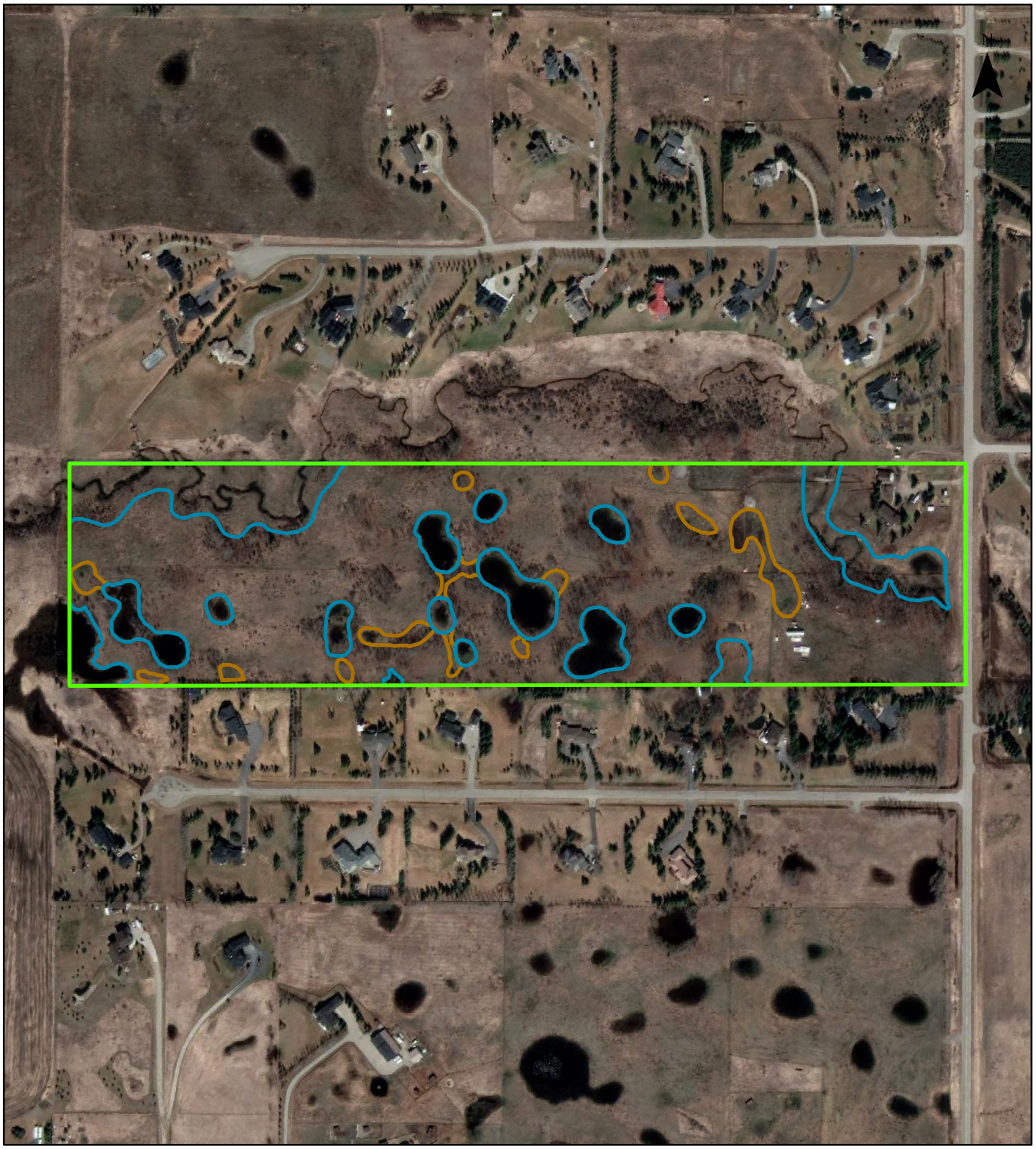
Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	AUGUST 22, 2015

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants



LEGEND

- Project Site
- Wetlands
- Ephemeral

Source: Google Earth™

Note: Wetlands, Waterbodies and Drainage have been desktop delineated.

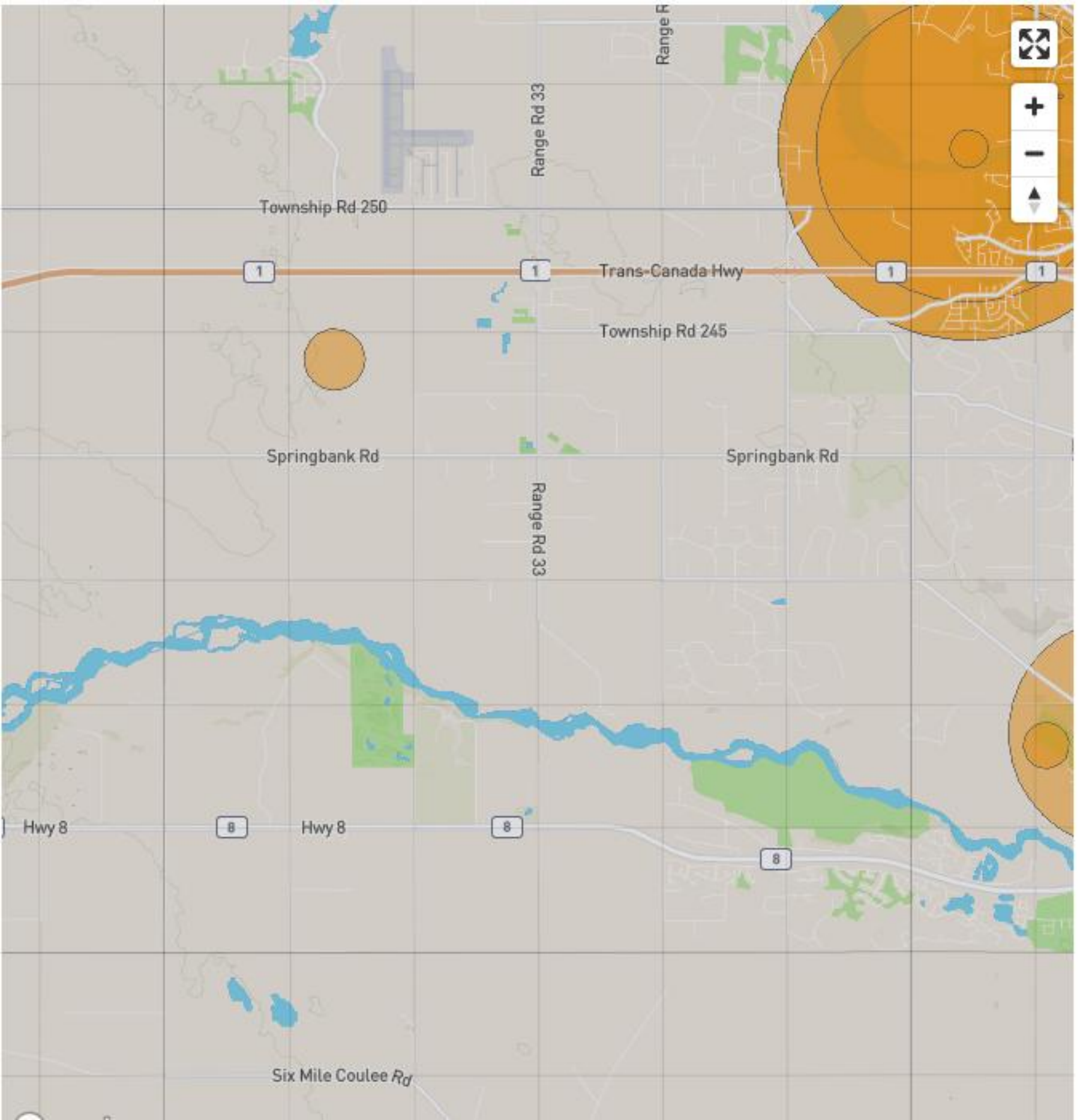
Note: The aerial photograph has been geo-referenced and is not 100% spatially accurate.

Client:	MR. ALLAN MARKIN
Project:	WILLOW RANCH BIA
Title:	MAY 4, 2020

Date:	Project No.:	Scale:	
03-01-2021	WER121-15	1:5,000	**APP: A**

Westhoff Engineering Resources, Inc.
Land & Water Resources Management Consultants

Appendix B ACIMIS Database Search


Range Rd 33
Township Rd 250
1
Trans-Canada Hwy
Township Rd 245
Springbank Rd
Springbank Rd
Range Rd 33
Hwy 8
8
Hwy 8
8
8
Six Mile Coulee Rd

Date: 26/2/2021
Requestor: Consultant
Reason for Request: Environmental Reporting
SEC: 21 **TWP:** 024 **RGE:** 03 **MER:** 5

Alberta Parks

Non-sensitive EOs (updated: October 2017)

M_RR_TTT_SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D

No Non-sensitive EOs Found: Next Steps - See FAQ (https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2 - Process)

Sensitive EOs (updated: October 2017)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D

No Sensitive EOs Found: Next Steps - See FAQ (https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/faqs.aspx#2 - Process)

Protected Areas (updated: October 2017)

M-RR-TTT-SS	PROTECTED_AREA_NAME	TYPE	IUCN

No Protected Areas Found

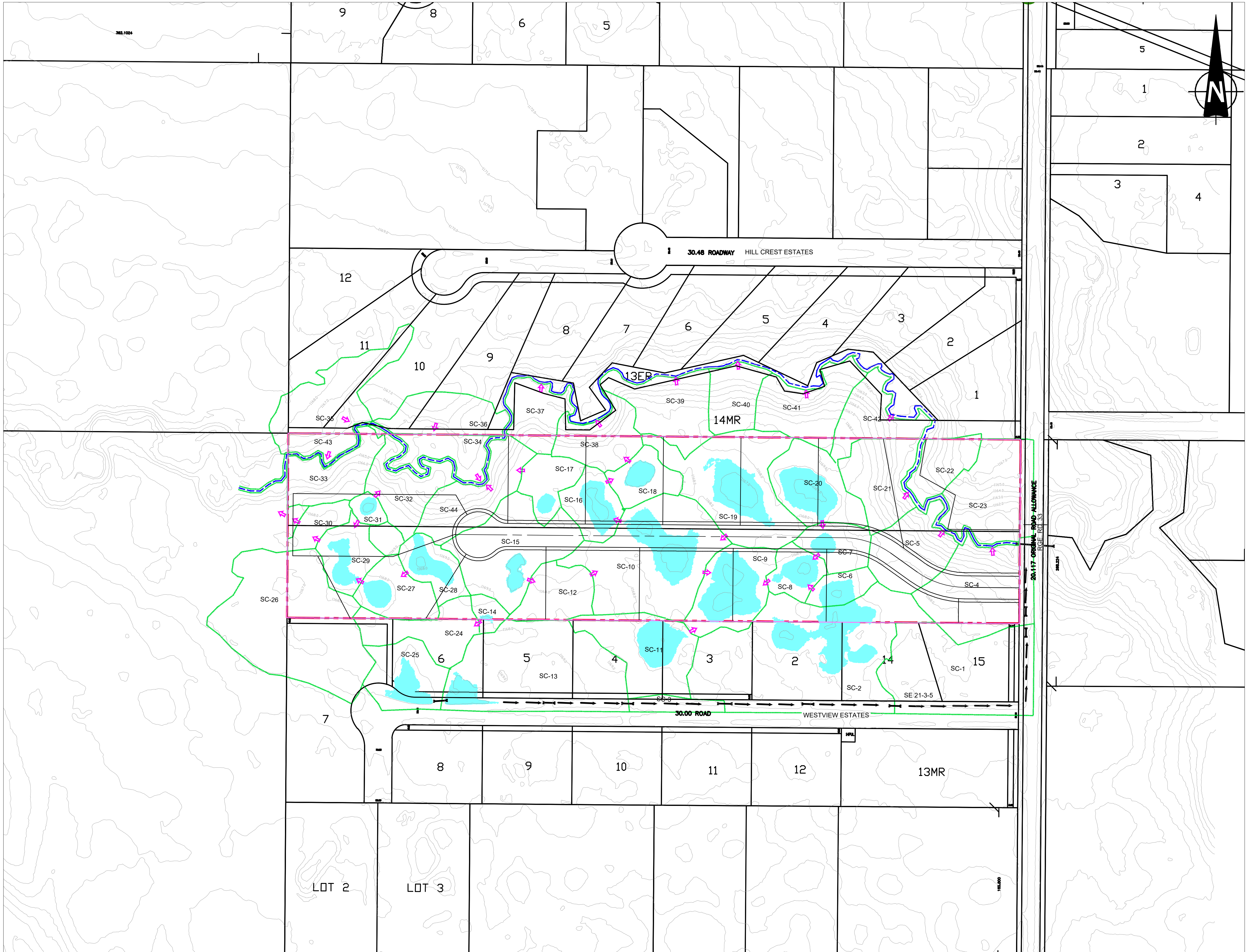
Crown Reservations/Notations (updated: October 2017)

M-RR-TTT-SS	NAME	TYPE

No Crown Reservations/Notations Found

Updated: Dec 11, 2019

Appendix C Westhoff Catchment Mapping and Waterdrop Analysis



NOTES:

1- CADASTRAL MAP AND AERIAL PHOTO OBTAINED FROM RVC

2- LIDAR DATA IS FROM TARIN RESOURCE SERVICES LTD.

LEGEND:

- SUBJECT PROPERTY
- CREEK ALIGNMENT
- CATCHMENT BOUNDARY
- SC-1 CATCHMENT ID
- POSSIBLE SPILL LOCATION
- CULVERTS
- POTENTIAL NATURAL DEPRESSION STORAGE
- ROADSIDE DITCH FLOW DIRECTION
- 0.20m CONTOURS

REV.	DATE	REVISION DESCRIPTION	DRW	DES	CHK	APPR

ENGINEER'S SEAL:

PERMIT:

CLIENT:

Mr. ALLAN MARKIN

CONSULTANT:

Westhoff Engineering Resources, Inc.

Land & Water Resources Management Consultants

PROJECT:

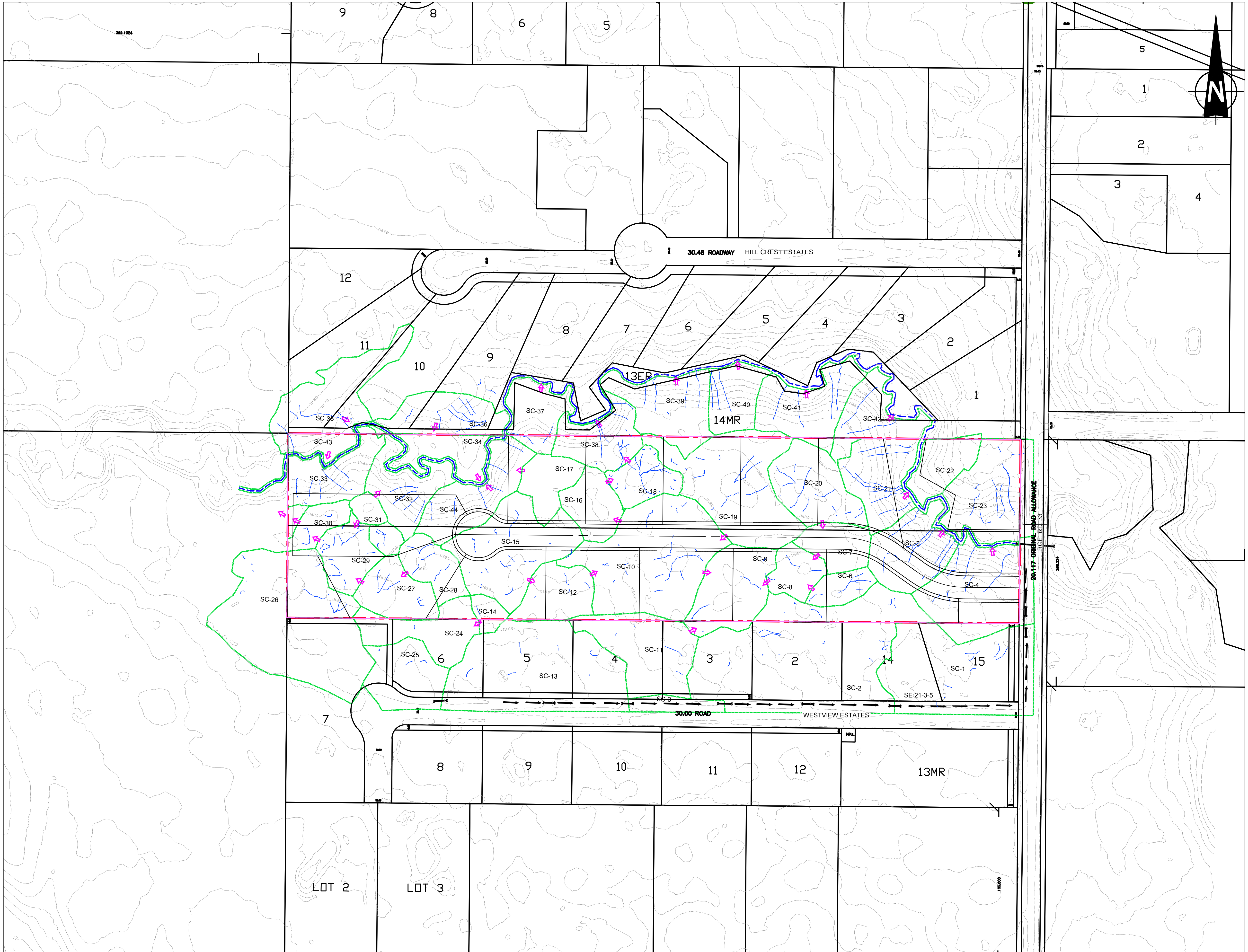
WILLOW RANCH SITE PLAN
PORTION OF SE 21-24-3-W5M

TITLE:

CATCHMENTS AND NATURAL DEPRESSION STORAGE AREAS

DESIGNED:	CHECKED:	DATE:	JOB No.	DRAWING NO.
M. NAMMO	D. WESTHOFF	NOV. 17, 2020	WER120-35	TP03
DRAFTED:	APPROVED:	SCALE:	CAD FILE:	
M. NAMMO	D. WESTHOFF	As Shown	12035TP01.dwg	

CAD 2005 1:1=22x34



NOTES:

1- CADASTRAL MAP AND AERIAL PHOTO OBTAINED FROM RVC

2- LIDAR DATA IS FROM TARIN RESOURCE SERVICES LTD.

LEGEND:

- SUBJECT PROPERTY
- CREEK ALIGNMENT
- CATCHMENT BOUNDARY
- SC-1 CATCHMENT ID
- POSSIBLE SPILL LOCATION
- CULVERTS
- WATER DROP DRAINAGE PATH
- ROADSIDE DITCH FLOW DIRECTION
- 0.20 CONTOURS

1:2000 0 10 20 30 40 m

REV.	DATE	REVISION DESCRIPTION	DRW	DES	CHK	APPR

ENGINEER'S SEAL:

PERMIT:

CLIENT:

Mr. ALLAN MARKIN

CONSULTANT:

Westhoff Engineering Resources, Inc.

Land & Water Resources Management Consultants

PROJECT:

WILLOW RANCH SITE PLAN
PORTION OF SE 21-24-3-W5M

TITLE:

WATER DROP ANALYSIS

DESIGNED: M. NAMMO	CHECKED: D. WESTHOFF	DATE: NOV. 17, 2020	JOB No. WER120-35	DRAWING NO. TP04
DRAFTED: M. NAMMO	APPROVED: D. WESTHOFF	SCALE: As Shown	CAD FILE: 12035TP01.dwg	

CAD 2005 1:1=22x34

Appendix D Potential Wildlife Species

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
Amphibians and Reptiles					
boreal chorus frog	*Pseudacris aculate*	S			
western toad	*Anaxyrus boreas*	SEN		SC	SC
northern leopard frog	*Rana pipiens*	AR	TH	SC	EN
red-sided garter snake	*Thamnophis sirtalis*	SEN			
tiger salamander	*Ambystoma tigrinum*	S			
wandering garter snake	*Thamnophis elegans*	SEN			
wood frog	*Rana sylvatica*	S			
Mammals					
American badger	*Taxidea taxus*	SEN			
arctic shrew	*Sorex arcticus*	S			
big brown bat	*Eptesicus fuscus*	S			
bobcat	*Lynx rufus*	SEN			
common porcupine	*Erethizon dorsatum*	S			
cougar	*Felis concolor*	S			
coyote	*Canis latrans*	S			
deer mouse	*Peromyscus maniculatus*	S			
dusky shrew	*Sorex monticolus*	S			
grey squirrel	*Sciurus carolinensis*	EX			
hoary bat	*Lasiurus cinereus*	S			
least weasel	*Mustela nivalis*	S			
little brown bat	*Myotis lucifugus*	S			
long-tailed vole	*Microtus longicaudus*	S			
long-tailed weasel	*Mustela frenata*	MBAR			
masked shrew	*Sorex cinereus*	S			
meadow vole	*Microtis pennsylvanicus*	S			
moose	*Alces alces*	S			
mule deer	*Odocoileus hemionus*	S			
muskrat	*Ondatra zibethicus*	S			
northern flying squirrel	*Glaucomys sabrinus*	S			
northern pocket gopher	*Thomomys talpoides*	S			
prairie shrew	*Sorex haydeni*	S			

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
pygmy shrew	*Sorex hoyi*	S			
red bat	*Lasiurus borealis*	SEN			
red fox	*Vulpes vulpes*	S			
red squirrel	*Tamiasciurus hudsonicus*	S			
Richardson's ground squirrel	*Spermophilus richardsonii*	S			
silver-haired bat	*Lasionycteris noctivagans*	SEN			
snowshoe hare	*Lepus Americanus*	S			
southern red-backed vole	*Clethrionomys gapperi*	S			
striped skunk	*Mephitis mephitis*	S			
thirteen-lined ground squirrel	*Spermophilus tridecemlineatus*	UN			
water shrew	*Sorex palustris*	S			
western jumping mouse	*Zapus anaden*	S			
white-tailed deer	*Odocoileus virginianus*	S			
white-tailed jack rabbit	*Lepus townsendii*	S			
Birds					
alder flycatcher	*Empidonax alnorum*	S			
American crow	*Corvus brachyrhynchos*	S			
American dipper	*Cinclus mexicanus*	S			
American goldfinch	*Carduelis tristis*	S			
American kestrel	*Falco sparverius*	SEN			
American pipit	*Anthus rubescens*	S			
American redstart	*Setophaga ruticilla*	S			
American robin	*Turdus migratorius*	S			
American three-toed woodpecker	*Picoides dorsalis*	S			
American tree sparrow	*Spizella arborea*	S			
bald eagle	*Haliaeetus leucocephalus*	SEN			
Baltimore oriole	*Icterus galbula*	SEN			
bank swallow	*Riparia riparia*	SEN		TH	TH
barn swallow	*Hirundo rustica*	SEN		TH	TH
belted kingfisher	*Megaceryle alcyon*	S			
black-backed woodpecker	*Picoides arcticus*	SEN			

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
black-billed magpie	*Pica pica*	S			
black-capped chickadee	*Poecile atricapilla*	S			
black-crowned night-heron	*Nycticorax nycticorax*	SEN			
blackpoll warbler	*Dendroica striata*	S			
blue jay	*Cyanocitta cristata*	S			
blue-headed vireo	*Vireo solitarius*	S			
bobolink	*Dolichonyx oryzivorus*	SEN		TH	TH
bohemian waxwing	*Bombycilla garrulus*	S			
boreal chickadee	*Poecile hudsonica*	S			
brewer's blackbird	*Euphagus cyanocephalus*	S			
broad-winged hawk	*Buteo platypterus*	SEN			
brown creeper	*Certhia americana*	SEN			
brown thrasher	*Toxostoma rufum*	S			
brown-headed cowbird	*Molothrus ater*	S			
buff-breasted sandpiper	*Tryngites subruficollis*	S			
burrowing owl	*Athene cunicularia*	AR	EN	EN	EN
calliope hummingbird	*Stellula calliope*	S			
Cassin's vireo	*Vireo cassinii*	UN			
cedar waxwing	*Bombycilla cedrorum*	S			
chipping sparrow	*Spizella passerina*	S			
Clark's nutcracker	*Nucifraga columbiana*	S			
clay-colored sparrow	*Spizella pallida*	S			
cliff swallow	*Petrochelidon pyrrhonota*	S			
common grackle	*Quiscalus quiscula*	S			
common nighthawk	*Chordeiles minor*	SEN		TH	TH
common raven	*Corvus corax*	S			
common redpoll	*Carduelis flammea*	S			
common snipe	*Gallinago delicata*	S			
common yellowthroat	*Geothlypis trichas*	SEN			
Connecticut warbler	*Oporornis agilis*	S			
Cooper's hawk	*Accipiter cooperii*	S			
dark-eyed junco	*Junco hyemalis*	S			

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
downy woodpecker	*Picoides pubescens*	S			
dusky flycatcher	*Empidonax oberholseri*	S			
eastern kingbird	*Tyrannus tyrannus*	S			
eastern phoebe	*Sayornis phoebe*	SEN			
Eurasian collared dove	*Streptopelia decaocto*	EX			
European starling	*Sturnus vulgaris*	EX			
evening grosbeak	*Coccothraustes vespertinus*	S		SC	
golden eagle	*Aquila chrysaetos*	SEN			
golden-crowned kinglet	*Regulus satrapa*	S			
gray catbird	*Dumetella carolinensis*	S			
gray jay	*Perisoreus canadensis*	S			
gray partridge	*Perdix perdix*	EX			
great blue heron	*Ardea herodias*	SEN			
great gray owl	*Strix nebulosa*	SEN			
great horned owl	*Bubo virginianus*	S			
hairy woodpecker	*Picoides villosus*	S			
hermit thrush	*Catharus guttatus*	S			
hoary redpoll	*Acanthis hornemanni*	S			
hooded merganser	*Lophodytes cucullatus*	S			
horned lark	*Eremophila alpestris*	S			
house finch	*Carpodacus mexicanus*	S			
house sparrow	*Passer domesticus*	EX			
house wren	*Troglodytes aedon*	S			
killdeer	*Charadrius vociferus*	S			
least flycatcher	*Empidonax minimus*	SEN			
least sandpiper	*Calidris minutilla*	S			
Le Conte's sparrow	*Ammodramus leconteii*	S			
Lincoln’s sparrow	*Melospiza lincolnii*	S			
magnolia warbler	*Dendroica magnolia*	S			
merlin	*Falco columbarius*	S			
mountain bluebird	*Sialia currucoides*	S			
mountain chickadee	*Poecile gambeli*	S			

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
mourning dove	*Zenaida macroura*	S			
northern flicker	*Colaptes auratus*	S			
northern goshawk	*Accipiter gentilis*	SEN			
northern harrier	*Circus cyaneus*	S			
northern pygmy-owl	*Glaucidium gnoma*	SEN			
northern rough-winged swallow	*Stelgidopteryx serripennis*	S			
northern saw-whet owl	*Aegolius acadicus*	S			
northern shrike	*Lanius excubitor*	S			
northern waterthrush	*Seiurus noveboracensis*	S			
olive-sided flycatcher	*Contopus cooperi*	MBAR		TH	TH
orange-crowned warbler	*Vermivora celata*	S			
osprey	*Pandion haliaetus*	SEN			
palm warbler	*Dendroica palmarum*	S			
peregrine falcon	*Falco peregrinus*	AR	TH		
ovenbird	*Seiurus aurocapillus*	S			
pied-billed grebe	*Podilymbus podiceps*	SEN			
pileated woodpecker	*Dryocopus pileatus*	SEN			
pine grosbeak	*Pinicola enucleator*	S			
pine siskin	*Carduelis pinus*	S			
prairie falcon	*Falco mexicanus*	SEN	SC		
purple finch	*Carpodacus purpureaus*	S			
red crossbill	*Loxia curvirostra*	S			
red-breasted nuthatch	*Sitta canadensis*	S			
red-eyed vireo	*Vireo olivaceus*	S			
red-naped sapsucker	*Sphyrapicus nuchalis*	UN			
red-tailed hawk	*Buteo jamaicensis*	S			
red-winged blackbird	*Agelaius phoeniceus*	S			
ring-necked pheasant	*Phasianus colchicus*	EX			
rock pigeon	*Columba livia*	EX			
rose-breasted grosbeak	*Pheucticus ludovicianus*	S			
rough-legged hawk	*Buteo lagopus*	S			
ruby-crowned kinglet	*Regulus calendula*	S			

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
ruby-throated hummingbird	*Archilochus colubris*	S			
ruffed grouse	*Bonasa umbellus*	S			
rufous hummingbird	*Selasphorus rufus*	S			
rusty blackbird*	*Euphagus carolinus*	SEN		SC	SC
sandhill crane	*Grus canadensis*	SEN			
savannah sparrow	*Passerculus sandwichensis*	S			
say's phoebe	*Sayornis saya*	S			
sharp-shinned hawk	*Accipiter striatus*	S			
solitary sandpiper	*Tringa solitaria*	S			
sora	*Porzana carolina*	SEN			
spotted sandpiper	*Actitis macularius*	S			
spotted towhee	*Pipilo maculatus*	S			
Sprague's pipit	*Anthus spragueii*	SEN	SC	TH	TH
Steller's jay*	*Cyanocitta stelleri*	S			
Swainson's hawk	*Buteo swainsoni*	S			
Swainson's thrush	*Catharus ustulatus*	S			
Tennessee warbler	*Vermivora peregrina*	S			
Townsend's solitaire	*Myadestes townsendi*	S			
Townsend's warbler	*Dendroica townsendi*	S			
tree swallow	*Tachycineta bicolor*	S			
upland sandpiper	*Bartramia longicauda*	SEN			
varied thrush	*Txoreus vaevius*	S			
veery	*Catharus fuscescens*	S			
vesper sparrow	*Pooecetes gramineus*	S			
violet-green swallow	*Tachycineta thalassina*	S			
Virginia rail	*Rallus limicola*	UN			
warbling vireo	*Vireo gilvus*	S			
western kingbird	*Tyrannus verticalis*	S			
western tanager	*Piranga ludoviciana*	S			
western wood-pewee	*Contopus sordidulus*	MBAR			
white-breasted nuthatch	*Sitta carolinensis*	S			
white-crowned sparrow	*Zonotrichia leucophrys*	S			

Common Name	Scientific Name	Provincial Listing		Federal Listing	
		General Status	Wildlife Act	COSEWIC	SARA Schedule 1
white-faced ibis	*Plegadis chihi*	SEN			
white-throated sparrow	*Zonotrichia albicollis*	S			
white-winged crossbill	*Loxia leucoptera*	S			
willet	*Catoptrophorus semipalmatus*	S			
Wilson's snipe	*Gallinago delicata*	S			
Wilson's warbler	*Wilsonia pusilla*	S			
yellow rail	*Coturnicops noveboracensis*	UN		SC	SC
yellow warbler	*Dendroica petechia*	S			
yellow-bellied sapsucker	*Sphyrapicus varius*	S			
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	S			
yellow-rumped warbler	*Dendroica coronata*	S			

Note: UN = Undetermined, S = Secure, AR = At Risk, MBAR = May Be At Risk, SEN = Sensitive, EN = Endangered, TH = Threatened, SC = Species of Concern

Appendix E FWMIS Report

Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Date: 26-Feb-2021 12:29

Species present within the current extent

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK TROUT	BAIRD'S SPARROW	No Species Found in Search Extent
BROWN TROUT	COUGAR	
BULL TROUT	GRASSHOPPER SPARROW	
BURBOT	GREAT BLUE HERON	
LONGNOSE DACE	LEAST FLYCATCHER	
LONGNOSE SUCKER	WESTERN WOOD-PEWEE	
MOUNTAIN WHITEFISH		
RAINBOW TROUT		
WHITE SUCKER		

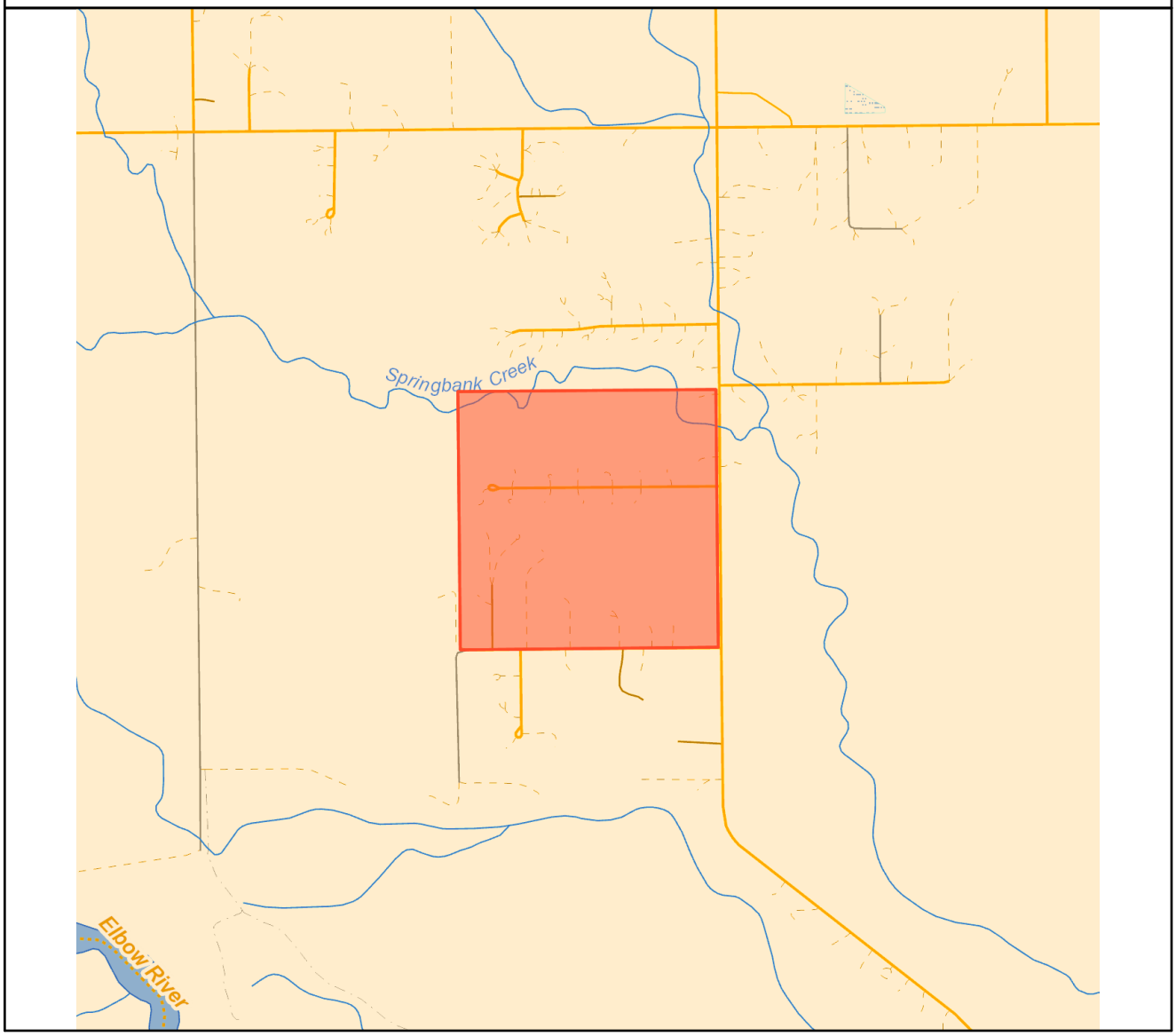
Buffer Extent

Centroid (X,Y)	Projection	Centroid (Qtr Sec Twp Rng Mer)	Radius or Dimensions
545114, 5654015	10-TM AEP Forest	SE 21 24 3 5	3 kilometers

Contact Information

For contact information, please visit:
https://www.alberta.ca/fisheries-and-wildlife-management-contacts.aspx

26-Feb-2021 12:29 **Map Results**



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