



RELATED REPORT
Phase 1 Environmental Site Assessment

1



The City of Calgary

Phase I Environmental Site Assessment

Country Hills Boulevard Functional Planning Study

Final Report

April 2020





ISL Engineering and Land Services Ltd. is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.

Executive Summary

The City of Calgary (The City) retained ISL Engineering and Land Services Ltd. (ISL) to conduct a Phase I Environmental Site Assessment (ESA) as part of the Country Hills Boulevard Widening Project (the Project). The purpose of this Phase I ESA is to identify actual and potential sources of site contamination caused by current and/or historical land uses. It will be used to inform eventual construction practices as part of the Project, primarily to identify areas of potential contamination that may require additional investigation or soil and/or groundwater management through a materials management plan (MMP). The functional planning study area is defined as the Project Area. The Study Area encompasses the Project Area and includes all adjacent properties within a 100 meter (m) buffer.

The majority of the Project Area consists of roadways, natural areas, and residential, retail, commercial and industrial development. Previous uses were predominantly for agriculture and transportation. The surrounding Study Area includes mostly commercial and residential properties, including the Harvest Hills and Coventry Hills neighbourhoods, The District at North Deerfoot and The Annex developments, a number of car dealerships and the One Properties Stonegate Landing development. The CP Rail line and an ATCO gas facility are also features of note in the Study Area.

Most of the Project will likely only require excavation in the Project Area to construct the road widening, medians and ramps. It should be noted that the APECs presented are conservative in nature, and future design consultants should reassess them based on their proximity to excavation areas and the depths of the excavations, when finalized.

APECs that are within the Study Area are summarized below:

- CP Rail right-of-way, as contamination was noted in reports from the nearby Stone Creek Adventure Golf that was hypothesized to originate from CP Rail. It should be noted that the rail crossing design is ongoing, but the preference is to widen the current grade separated crossing. This would limit required excavations within the right-of-way and thus lower the risk of encountering contaminated material. This APEC should be re-evaluated during detailed design to determine the potential risk to the project when construction details are known.
- Areas within the Project Area nearby abandoned oil and gas wells, particularly near Stone Creek Adventure Golf and the ATCO gas facility. The abandoned oil and gas wells are located approximately 180 m south of the centre of the roadway and just outside the Study Area (Figure 5.1). Operator information for these wells are included in Appendix E. This APEC should also be re-evaluated during detailed design, as they may pose a low risk to the Project due to the distance to the wells.
- Locations with registered, active fuel storage tanks (Deerfoot Shell Gas Station, Country Hills Hyundai and Aveda Transportation and Energy Services) and sites that are listed to have fuel storage and/or auto repairs taking place (Mercedes-Benz Country Hills, Country Hills Automotive [Country Hills Hyundai], Country Hills Nissan, Country Hills Toyota and Country Hills Volkswagen). The maximum depth of excavation of the Project is currently unknown but is typically less than 1 m for road widening activities. Some areas will require deeper excavations for utilities or stormwater features. However, in general, the likelihood of encountering contaminated soil and groundwater is deemed to be low over a majority of the Project area. This risk should be confirmed during detailed design once maximum excavation depths and construction techniques are finalized.

Further, future design consultants should review the reports available from the City that were identified on the EnviroSite reports to determine if these areas should be continued to be considered as APECs, primarily:

- 11155 14 Street NE (Phase I and II ESAs)
- 1350 Country Hills Boulevard NE (Phase I and II ESAs)
- 10621 Barlow Trail NE (Phase I and II ESAs, sampling reports)

For the purposes of this Phase I ESA, addresses where a Phase II ESA have been completed are conservatively considered APECs until the results of these ESAs can be reviewed to determine if contamination is or was present. It should be noted that while the sites that have had a Phase II ESA completed have a higher likelihood of contamination, it is also common that a Phase II ESA and subsequent sampling conclude that contamination is not present or has been effectively remediated.

Caution will need to be taken on any construction near the Country Hills Boulevard and Deerfoot Trail interchange due to the presence of pipelines in the area. Finally, any electrical infrastructure on the ground could pose contamination issues related to PCBs.

Although there are APECs present, there is a low risk for contamination to be encountered outside of areas of the Project requiring deeper excavations. All APECs should be re-evaluated during detailed design once Project excavation depths, locations and construction methodologies are finalized. Detailed investigations into the specific APECs (i.e. a Phase II ESA) are not recommended for this Project at this time. Confirmatory sampling during geotechnical drilling activities in detailed design phases of the Project could be undertaken to provide certainty with regards to potential contamination, particularly in areas proximal to APECs that require excavation during construction. A materials management plan (MMP) may be considered to be implemented prior to construction if the potential for encountering contamination is high or if potentially contaminated soil reuse is planned. The MMP would outline proper soil handling and groundwater management procedures during construction to ensure worker and public health and safety.

If any evidence of environmental impact is visible during construction within the Project Area, particularly near the areas listed or near electrical equipment, transformers or capacitors, the contractor must follow The City's contamination discovery procedures, the Environmental Construction Operation (ECO) plan and the MMP. Environmental impacts could include stained or discoloured soil, fill with debris or household garbage, odours, sheens and/or abandoned pipes or tanks. Though no specific electrical infrastructure was identified to contain PCBs, contamination can vary dependent on the dates of manufacturing of the infrastructure. Care should be taken near electrical equipment and the demolition, construction or replacement of any electrical infrastructure should be completed by a qualified professional.



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1.0 Introduction

With the existing traffic congestion and planned growth along the corridor, the widening of Country Hills Boulevard from four to six lanes from Coventry Boulevard to Barlow Trail is a critical project for The City of Calgary (The City). The City required a cohesive functional plan for the corridor and investigate associated upgrades required to widen the corridor to six lanes across Deerfoot Trail, Nose Creek and the CP Rail tracks.

The City retained ISL Engineering and Land Services Ltd. (ISL) to conduct a Phase I Environmental Site Assessment (ESA) as part of the Country Hills Boulevard Widening Functional Planning Study Project (the Project). The purpose of this Phase I ESA is to identify actual and potential sources of site contamination caused by current and/or historical land uses. It will be used to inform eventual construction practices as part of the Project, primarily to identify areas of potential contamination that may require additional investigation or soil and/or groundwater management.

The functional planning study area (Project Area) is located within sections 23, 24, 25 and 26, of Township 25, Range 1, W5M located within the city of Calgary, Alberta. The Phase 1 ESA Study Area encompasses the Project Area and includes all adjacent properties within a 100 meter (m) buffer.

Authorization to proceed with this assessment was received from The City on July 8, 2019 as part of the overall project contract.

1.1 Scope of Work

ISL's scope of work for this assessment includes the following:

- a records review of the Study Area using relevant aerial photographs, prior environmental assessment reports and a regulatory information search;
- a site visit to confirm the records review and to observe and identify potential environmental concerns both at the Project Area and adjacent properties (the site visit was conducted on August 15, 2019), and;
- the compilation of the records review and site visit results into a summary report presenting the results of the assessment including an evaluation of the data collected, conclusions, and recommendations

This Phase I ESA was conducted in accordance with the Canadian Standards Association Z768-01 Phase I Environmental Site Assessment (CSA Standards, 2016), the Alberta Environment and Parks Alberta Environmental Site Assessment Standard (Alberta Environment and Parks, 2016) and The City of Calgary's Phase I Environmental Site Assessment Terms of Reference (The City of Calgary, 2016).



2.0 Site Description

The Study Area consists primarily of roadways, including the intersection of Country Hills Boulevard NE and Deerfoot Trail, located in the northeast quadrant of Calgary, AB. A majority of the Study Area consists of commercial, industrial and retail development, including The District at North Deerfoot and The Annex developments, a number of car dealerships and the One Properties Stonegate Landing development. In the western portion of the Study Area is Nose Creek and surrounding natural areas, the CP Rail line and the Harvest Hills and Coventry Hills neighbourhoods. The Project Area has an estimated area of 0.78 km², and the Study Area comprises 1.96 km² (Figure 2.1).

2.1 Topography/Drainage

The Study Area is situated within generally flat surface topography with a slightly higher elevation towards the north, and the slightly lower elevation Nose Creek valley to the west. Topography has been significantly altered by manmade activities, particularly in the area of the Country Hills Boulevard NE and Deerfoot Trail intersection (Appendix A).

Surface water in the Study Area drains to catch basins located in the roadways and in the commercial properties. The catch basins likely drain to the municipal storm sewer system. Nose Creek is located within the Study Area and is also the main drainage feature for surface water (Appendix A).

2.2 Geology

The bedrock geology underlying the Study Area is the Paskapoo Formation, a Paleocene-aged alluvium deposit composed of sandstone, siltstone and mudstone. The surficial geology in most of the Study Area is fluted moraine, which consists mainly of till. In the western portion of the Study Area, glaciolacustrine deposits are present, which are primarily well-sorted, fine-grained sediments of sand, silt and clay, and minor pebbly sand and gravel deposited in or along the margins of glacial lakes (Appendix A).

2.3 Hydrogeology

Groundwater levels in the area are expected to be a muted representation of the surface topography, and groundwater flow is anticipated to be towards Nose Creek. It should be noted that the direction of local shallow groundwater can be influenced by the presence of fill, perched water tables and/or underground utility corridors and locally may not necessarily reflect regional groundwater flow or a replica of the Study Area topography.

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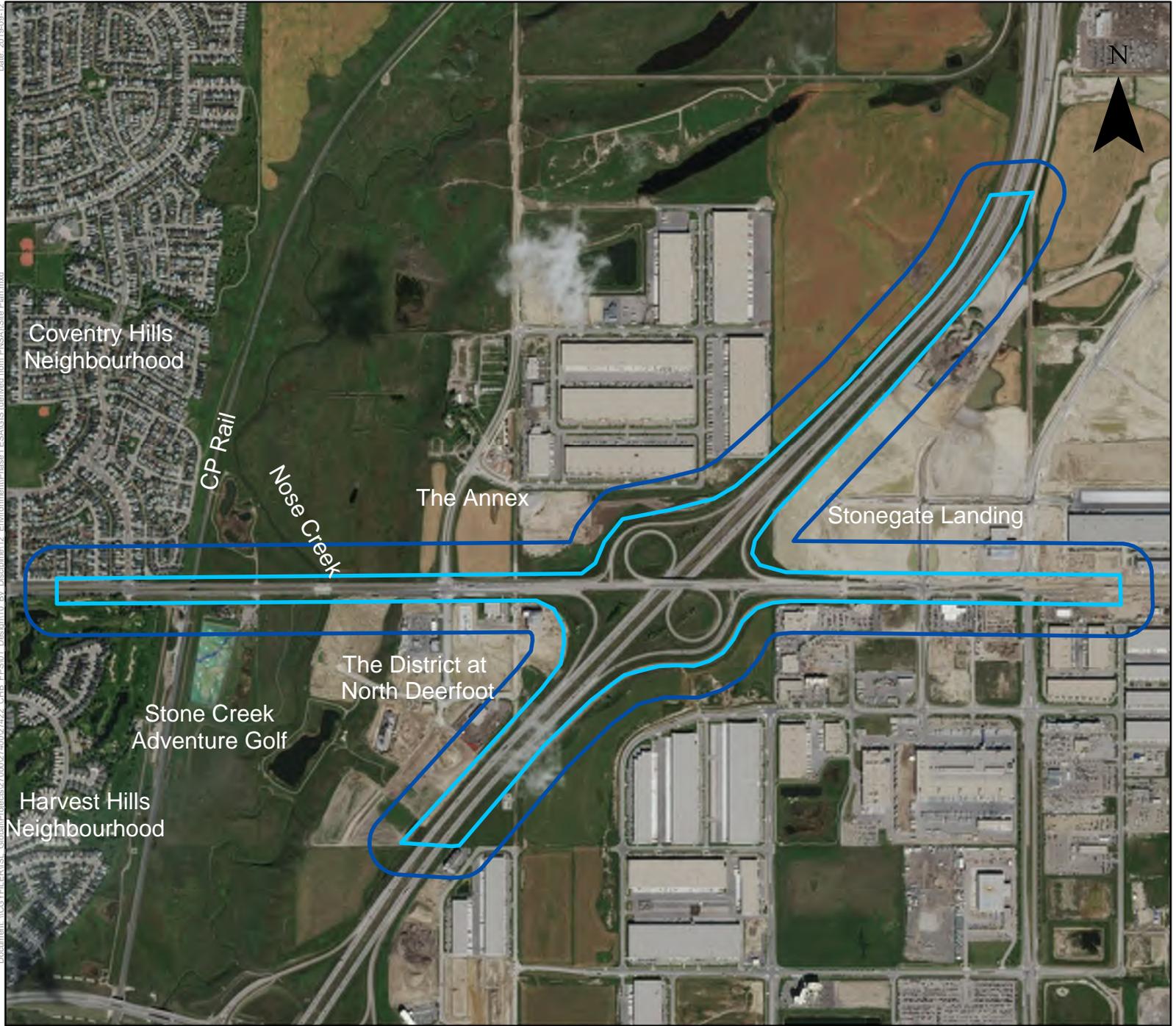
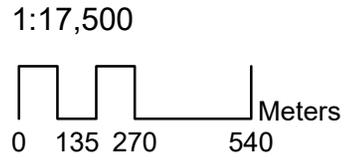


Figure 2.1

- Legend**
-  Study Area
 -  Project Area



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**

SITE PLAN





3.0 Records Review

The records review and search included a historical review of the Study Area using relevant aerial photographs, a review of prior environmental assessment reports, as well as a regulatory information search. Environmental Risk Information Services (ERIS) conducted some of the database searches as well as to cross-check database information and analyses. Records were reviewed for the Study Area, unless otherwise noted.

3.1 Aerial Photographs

Aerial photographs were obtained from the Alberta Environment and Parks (AEP) informatics branch’s distribution and repository. Historical aerial photographs from 1962 to 2016 were reviewed to assess historical land

Table 3.1: Summary of Aerial Photos

Year	Project Area	Study Area
1962	Historical Country Hills Boulevard is visible, as are north-south roadways. Remaining areas appear agricultural.	Agricultural areas and associated buildings/houses are visible.
1969	No significant changes	No significant changes
1971	Construction of Deerfoot Trail and the Country Hills Boulevard interchange is underway.	No significant changes, areas are still primarily agricultural and buildings/houses remain
1988	Deerfoot Trail is constructed, as is the Country Hills Boulevard interchange.	Earthworks construction to the west in the Coventry Hills neighbourhood. Other construction apparent along Deerfoot Trail in the southern portion of the Study Area.
2004	Widening of Country Hills Boulevard and construction of the cloverleaf interchange. Further commercial/industrial development in the eastern portion of the Project Area.	Significant construction of the Coventry Hills and Harvest Hill neighbourhoods. Construction of the driving range and commercial/industrial areas to the east, including an apparent parking lot. Construction of the ATCO gas facility in the southern portion of the Study Area.
2016	Further development of the commercial/industrial area to the east.	Development of The District at North Deerfoot and industrial area west of Deerfoot Trail. Earthworks being completed for the Stonegate Landing development to the east of Deerfoot Trail. Further development of the commercial/industrial areas in the east.

3.2 Individual Property Searches

Given the very large number of individual properties located within the Study Area, the thoroughness of the ERIS searches, the presence and quality of historical aerial photos in the area and the site visit conducted, the following searches were not completed for this Project: Land Use Zoning, Current Property Use Records, Fire Insurance Plans, Business Directories, and Current and Historical Land Titles. In ISL’s opinion, these searches are more relevant for Phase I ESAs conducted on individual parcels of land rather than large study areas such as this Project. The information collected as part of this Phase I ESA is sufficient to develop conclusions on areas of potential contamination that may require additional investigation or soil and/or groundwater management prior to construction activities.

3.3 Previous Environmental Site Assessments/Reports

3.3.1 Environmental Site Assessment Repository

ERIS conducted a search of the Alberta Environment and Parks Environmental Site Assessment Repository (ESAR) (Alberta Environment and Parks, 2019). A total of 44 records were returned for a 300 m buffer around the Project Area. Of those, 34 were records for reclamation certificates. The remaining records are summarized below; note that some records in the ERIS search were duplicates as they are searched on a quarter section basis.

- 10521 15 Street NE (ERIS Sites #2, 17, 37 and 39; Appendix C)
 - Former Alberta Transportation dry landfill; no further details available
- 10524 15 Street NE/1620 96 Ave NE (ERIS Sites #3 and 28; Appendix C)
 - Phase I and II ESA completed for Oxford Properties in 2008 as part of the development of the site from farmland to commercial
 - The Phase I ESA identified several areas of potential concern, including aboveground storage tanks, an oil and gas wellhead, a Quonset used for maintenance of farm equipment and a slough that had hydrovac waste disposed into
 - The Phase II ESA investigated these areas and found hydrocarbons present in shallow soil around the Quonset and aboveground storage tanks that exceeded applicable guidelines at that time
 - These locations are in the southern portion of the site, near Airport Trail and outside the Study Area, therefore they are not an area of potential environmental concern (APEC) for this Project
- 999 Country Hills Boulevard NE; Stone Creek Adventure Golf (ERIS Site #12; Appendix C)
 - Soil hydrocarbon contamination was found in 1991 and further investigated in 1999
 - Alberta Environment had no objections to the outdoor driving range proceeding in 1999 given hydrocarbon concentrations had decreased since 1991
 - In 1993 contamination was hypothesized to originate from the CP Rail right-of-way, which is noted as an APEC for this Project

ISL completed a cursory review of the available information, but did not complete a full, scientific review of all reports due to the amount of information available and the scope of this Phase I ESA. Therefore, The City can rely on reports provided by others provided the limitations of the individual reports are followed and The City conducts a thorough review of the information.

3.3.2 EnviroSite

An EnviroSite request was submitted to The City for the municipal address of the Deerfoot Shell Gas Station (11175 14 Street NE), Country Hills Toyota (20 Freeport Landing NE) and Country Hills Nissan (2451 Country Hills Boulevard NE) locations. These locations were chosen as they represent distinct areas throughout the Project Area and are likely APECs. The results are included in Appendix D.



The EnviroSite reports identified several additional ESAs, risk management plans and geotechnical reports that were not available on ESAR. Some of the addresses were outside the Study Area, but locations that were in the Study Area that should be subject to further review are:

- The District at North Deerfoot development:
 - 11142 15 Street NE (Phase I ESA)
 - 11155 14 Street NE (Phase I and II ESAs)
 - 1510 Country Hills Boulevard NE (Phase I ESA)
- 1350 Country Hills Boulevard NE (Phase I and II ESAs)
- 26-25-01 W5M (Phase I ESA)
- NE 1/4 23-25-01-W5M and NW 1/4 24-25-01-W5M (Phase I ESA)
- 10621 Barlow Trail NE (Phase I and II ESAs, sampling reports)

As the Project is currently only in the functional planning stage, individual reports were not examined. Future design consultants should request the reports above from the City and review them in detail to determine if these sites are APECs or not. For the purposes of this report, addresses where a Phase II ESA have been completed are conservatively considered APECs until the results of these ESAs can be reviewed to determine if contamination is or was present. It should be noted that while the sites that have had a Phase II ESA completed have a higher likelihood of contamination, it is also common that a Phase II ESA and subsequent sampling conclude that contamination is not present or has been effectively remediated.

3.4 Regulatory Information

3.4.1 Government of Alberta Water Well Information Database

Water well records were reviewed to include adjacent properties within 300 m of the Project Area. The Alberta Water Well Information Database returned 10 results for wells within the search area (Appendix C). Two wells were located within 35 m of the Project Area and the rest were located outside of 100 m. Of the two well records nearest to the Project Area, one is likely plotted in the wrong location, as it plots on Deerfoot Trail, and the other is a decommissioning record. As the surrounding properties are connected to The City's potable water distribution network, the water wells are not likely active domestic use wells.

3.4.2 Petroleum Tank Management Association of Alberta

Eris conducted a search of the Petroleum Tank Management Association of Alberta (PTMAA) database and yielded 6 records of registered fuel storage tanks within the Study Area (Appendix C; pp. 23-24). The PTMAA has regulated storage tanks since 1994 and compiles a list of active tank sites, sites with tanks temporarily out of service, and sites at which tanks have been removed from the ground. The Deerfoot Shell Gas Station, Country Hills Hyundai and Aveda Transportation and Energy Services all have registered, active tank sites. The Petro-Canada and A&W also returned an active tank site, but this is outside the Study Area (2600 Country Hills Boulevard NE). A summary of the storage tanks is provided below in Table 3.2.

Table 3.2: Petroleum Tank Management Association of Alberta Fuel Storage

Location	Type	Contents	Capacity (L)	Status	Approximate Distance from Project Area (m)
Country Hills Hyundai	Information Unavailable	Information Unavailable	Information Unavailable	Active	27
Deerfoot Shell Gas Station	Information Unavailable	Information Unavailable	Information Unavailable	Active	34
Aveda Transportation and Energy Services	Aboveground	Gasoline	5,000	Active	174
	Aboveground	Diesel	20,000	Active	
	Information Unavailable	Information Unavailable	Information Unavailable	Information Unavailable	

3.4.3 Alberta Energy Regulator

Alberta Energy Regulator (AER) information on oil and gas wells and facilities was searched by ERIS (Appendix C) and was cross-referenced, with the addition of pipeline information, through Abacus DataGraphics' Abadata online database (Abacus DataGraphics, 2019).

There are three oil and gas wells located within the Study Area: a reclamation certified water injection well and an abandoned well in the vicinity of Stone Creek Adventure Golf and an abandoned well located in the southern portion of the Study Area near the ATCO gas facility (Appendix E). All wells are further than 100 m from the Project Area. There are multiple freshwater pipelines located in the western portion of the Study Area, a crude oil and low vapour pressure (e.g., condensate, diesel, etc.) pipeline owned by Plains Midstream that runs through the intersection and an ATCO natural gas pipeline traveling south from their facility in the southern portion of the Study Area (Appendix E). There is a suspended Bonavista Energy crude oil single well battery listed on Abadata, located outside (south) of the Study Area.

3.4.4 Government of Alberta Authorization/Approval Search

There are many Environmental Protection and Enhancement Act authorizations issued that fall within the Study Area, all of which are general City of Calgary approvals for wastewater, stormwater and subdivisions.

3.4.5 National Pollutant Release Inventory

A National Pollutant Release Inventory (NPRI) website search was conducted by ERIS and there were no records of any substances being spilled within the Study Area, current to 2019 (Appendix C). Environment Canada has defined the NPRI as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

3.5 Other Searches

3.5.1 Commercial Activity Risk

A list of locations with Business Licenses for the following commercial activities: apartment building with 4 or more stories, auto-body shop, fabric cleaning, manufacturing, motor vehicle dealerships and



service/repair, and salvage yard/auto wrecking. This information is made available by The City and this search was conducted by ERIS (Appendix C). There are 13 sites that would qualify as commercial activity risk, most of which are motor-vehicle dealerships. The sites that could be considered APECs due to the activities at the site (primarily fuel storage and/or auto repairs) that are located within the Study Area are:

- Mercedes-Benz Country Hills
- Country Hills Automotive (Country Hills Hyundai)
- Country Hills Nissan
- Country Hills Toyota
- Country Hills Volkswagen

The Mercedes-Benz Country Hills location also is listed as a site with a business licence for fuel sales and storage (Appendix C).

■ 4.0 Site Visit

A site visit was undertaken to observe the Project Area and adjacent properties in order to confirm or refute the findings of the records search. Ms. Jasmine Skirten and Ms. Laura York, BSc. of ISL conducted the site visit on August 15, 2019. Due to the residential and commercial designations of the properties, and the size of the Study Area, internal observations and personal interviews were not conducted during the site visit. ISL visited as many properties within the Project Area as possible, although it should be noted that a majority of the Project Area is within road right of way. Site photographs taken during the site visit are included in Appendix F.

4.1 General Description of Properties/Structures

The Project Area consists primarily of roadways, including the intersection of Country Hills Boulevard NE and Deerfoot Trail. Other north-south roadways intersection Country Hills Boulevard include Coventry Boulevard NE, 14 Street NE, Freeport Drive NE and Barlow Trail NE. Significant development has or is occurring in the area. Residences dominate the eastern portion of the Study Area and include the Coventry Hills and Harvest Hills neighbourhoods to the north and south of Country Hills Boulevard, respectively. The CP Rail line passes under Country Hills Boulevard within the Nose Creek Valley, east of which is Stone Creek Adventure Golf, Nose Creek and an open field, recreational pathway and natural area. East of the Nose Creek valley is the relatively recent commercial and retail development of The District at North Deerfoot and the commercial and industrial The Annex development. East of the intersection with Deerfoot Trail are primarily car dealerships, commercial and retail locations and the Stonegate Landing development.

4.2 Odours

No unusual odours were noted during the site visit.

4.3 Staining

Pavement staining was noted in multiple locations throughout the site visit. At the southwest corner of the 14 Street NE and Country Hills Boulevard intersection, some staining was noted (Appendix F, Photo 24). Multiple stains were noted at the Deerfoot Shell Gas Station, some leading to drainage grates. An apparent leaking water valve was also noted at the Deerfoot Shell location (Appendix F, Photos 25 through 29). Pavement staining was also noted at the Country Hills Toyota (Appendix F, Photos 35 and 37) and at the Country Hills Nissan property (Appendix F, Photo 44). Finally, an oily substance was noted at the intersection of Country Hills Boulevard and Freeport Drive NE, which may have been related to recent paving activities (Appendix F, Photo 46).

4.4 Drains

Surface water at the Project Area drains to observed catch basins located in the roadways, as well as in Nose Creek. The catch basins drain to the municipal storm sewer system, outfalls of which were observed along Nose Creek.



4.5 Watercourses or Ditches

Nose Creek was crossed during the site visit. Roadside drainage ditches and catch basins are incorporated into the Project as part of the roadway design. Stormwater wet ponds were noted adjacent to the CP Rail line along the north side of Country Hills Boulevard and near Nose Creek (Appendix F, Photos 5 and 15). Standing water was noted in the northeast and northwest corners of the intersection of Country Hills Boulevard and Freeport Drive NE (Appendix F, Photos 47 and 48).

4.6 Wastewater

No private wastewater operations were noted during the site visit. The City's sanitary treatment system is assumed to be the utilized service throughout the Study Area.

4.7 Waste/Sewage

In the residential areas of the Study Area, The City's waste and recycling program is expected to be utilized for waste disposal. In the commercial areas, The City's business waste collective services are expected to be the main form of waste disposal. The municipal sewer system is utilized as sewage disposal throughout the Study Area.

4.8 Wells

No oil and gas, water wells or groundwater monitoring wells were observed during the site visit. It should be noted that groundwater monitoring wells can often be completed as flush-mounted wells in high-traffic areas, thus limiting their visibility.

4.9 Topographic, Geological and Hydrogeological Conditions

The Project Area was observed to have generally flat surface topography except for the Nose Creek valley and areas built up at the interchange. The surrounding Study Area had local variations but was generally flat. No bedrock outcrops were observed. Groundwater levels in the area are expected to be a muted representation of the surface topography.

4.10 Storage Tanks and Process Vessels

Miscellaneous holding containers were noted at the Country Hills Toyota, containing unknown substances (Appendix F, Photos 36 through 39). The Country Hills Hyundai dealership also contained storage containers and a used oil container (Appendix F, Photos 41 and 42), and the Country Hills Nissan had an aboveground fuel storage tank visible (Appendix F, Photos 44 and 45). It should be noted that not every property in the Project Area was examined in detail, only areas readily accessible by the public.

4.11 Stressed Vegetation

There was no visibly stressed vegetation in the area that was different from the general condition of vegetation in the area. A hayed agricultural area remains east of the Country Hills Boulevard and Deerfoot Trail intersection, west of the Country Hills Toyota.

4.12 Fill

There is likely to be fill underlying roadways and properties throughout the Study Area, particularly around bridges and intersections.

4.13 Roads and Parking Facilities

Country Hills Boulevard NE, Deerfoot Trail, Coventry Boulevard NE, 14 Street NE, Freeport Drive NE and Barlow Trail NE are the major public roadways within the Study Area, including corresponding rights-of-way and intersections. There is designated private parking areas located within the Study Area, typically used by employees and shoppers in commercial and retail areas. The car dealerships have corresponding parking lots as well.

4.14 Special Attention Items

As noted in Canadian Standards Association Z768-01 Phase I Environmental Site Assessment (CSA Standards, 2016) and the AEP Alberta Environmental Site Assessment Standard (Alberta Environment and Parks, 2016), special attention items include but are not limited to:

- polychlorinated biphenyls (PCBs),
- naturally occurring radioactive materials,
- asbestos containing materials,
- lead,
- mercury,
- ozone depleting substances, and
- urea foam formaldehyde insulation.

Building interiors are the common sources of a majority of these special attention items. As the building interiors were not inspected due to the size of the Project Area and the lack of public access to many of the buildings, the presence or absence of asbestos containing materials, lead, mercury, ozone depleting substances and urea foam formaldehyde insulation cannot be commented on. Noise, vibration and electric and magnetic fields are present within the Project Area as it is located within road rights-of-way. Pre-1980 electrical infrastructure could contain PCBs, primarily in transformers, capacitors, circuit breakers and heat transfer equipment (Government of Canada, 2018). Electrical infrastructure was noted during the site visit, although the age of it could not be determined. Care should be taken during construction near electrical equipment and the demolition, construction or replacement of any electrical infrastructure should be completed by a qualified professional.

Several major utilities were noted for the Project Area:

- A major overhead transmission line runs north-south in the vicinity of Nose Creek
- Minor overhead transmission lines run east-west along Country Hills Boulevard, from Coventry Boulevard NE to Deerfoot Trail
- An ATCO gas pipeline also parallels the overhead transmission lines

Additionally, an ATCO gas facility is located in the southern extents of the Project Area, east of Deerfoot Trail (Appendix F, Photos 52 through 55).



5.0 Evaluation of Findings and Recommendations

The majority of the Project Area consists of roadways, natural areas, and residential, retail, commercial and industrial development. Previous uses were predominantly for agriculture and transportation. The surrounding Study Area includes mostly commercial and residential properties, including the Harvest Hills and Coventry Hills neighbourhoods, The District at North Deerfoot and The Annex developments, a number of car dealerships and the One Properties Stonegate Landing development. The CP Rail line and an ATCO gas facility are also features of note in the Study Area.

Most of the Project will likely only require excavation in the Project Area to construct the road widening, medians and ramps. It should be noted that the APECs presented are conservative in nature, and future design consultants should reassess them based on their proximity to excavation areas and the depths of the excavations, when finalized.

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Further, future design consultants should review the reports available from the City that were identified on the EnviroSite reports to determine if these areas should be continued to be considered as APECs, primarily:

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- 1350 Country Hills Boulevard NE (Phase I and II ESAs)
- 10621 Barlow Trail NE (Phase I and II ESAs, sampling reports)

For the purposes of this Phase I ESA, addresses where a Phase II ESA have been completed are conservatively considered APECs until the results of these ESAs can be reviewed to determine if contamination is or was present. It should be noted that while the sites that have had a Phase II ESA completed have a higher likelihood of contamination, it is also common that a Phase II ESA and subsequent sampling conclude that contamination is not present or has been effectively remediated.

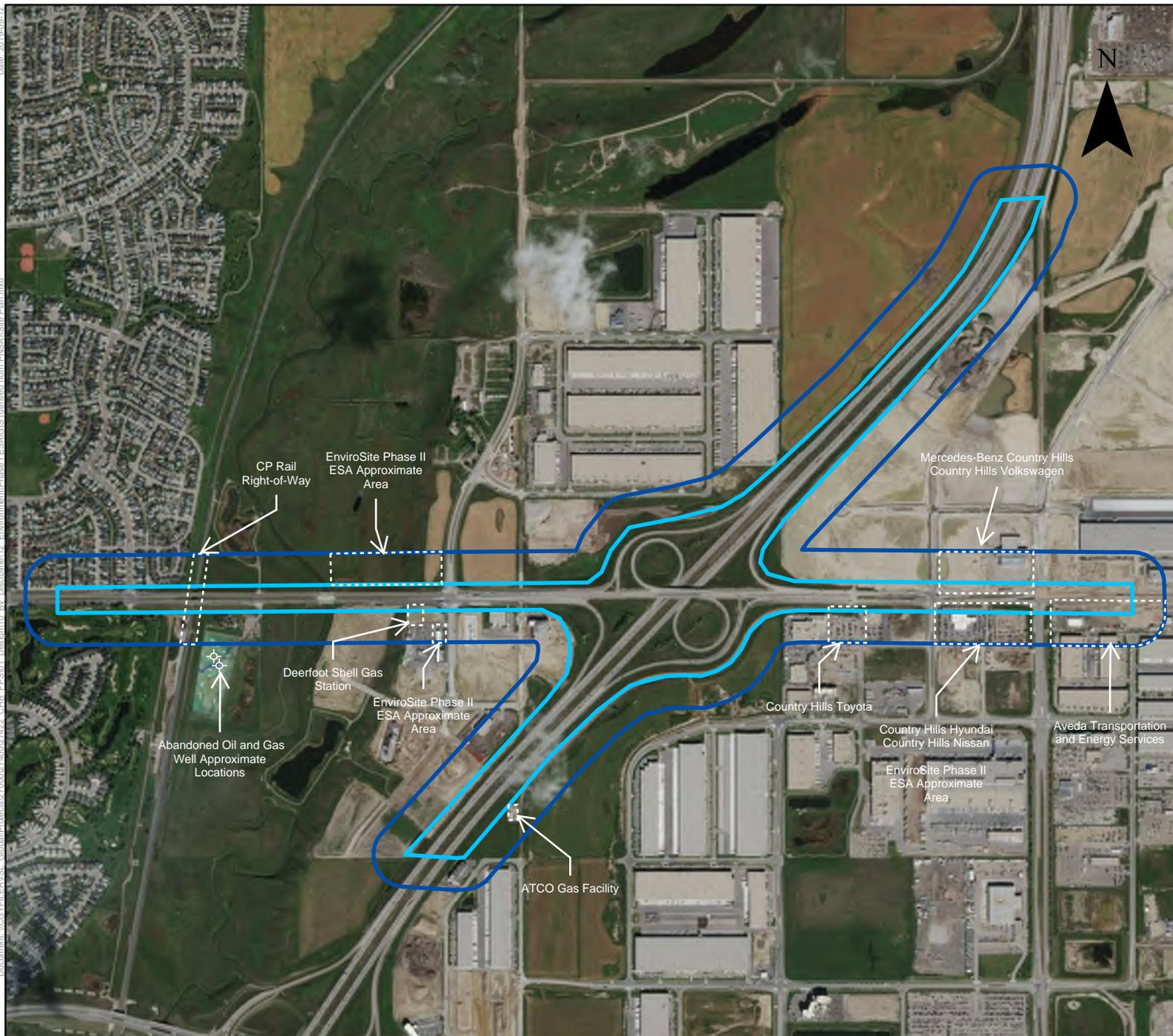
Caution will need to be taken on any construction near the Country Hills Boulevard and Deerfoot Trail interchange due to the presence of pipelines in the area. Finally, any electrical infrastructure on the ground could pose contamination issues related to PCBs.

Although there are APECs present, there is a low risk for contamination to be encountered outside of areas of the Project requiring deeper excavations. All APECs should be re-evaluated during detailed design once Project excavation depths, locations and construction methodologies are finalized. Detailed investigations into the specific APECs (i.e. a Phase II ESA) are not recommended for this Project at this time. Confirmatory sampling during geotechnical drilling activities in detailed design phases of the Project could be undertaken to provide certainty with regards to potential contamination, particularly in areas proximal to APECs that require excavation during construction. A materials management plan (MMP) may be considered to be implemented prior to construction if the potential for encountering contamination is high or if potentially contaminated soil reuse is planned. The MMP would outline proper soil handling and groundwater management procedures during construction to ensure worker and public health and safety.

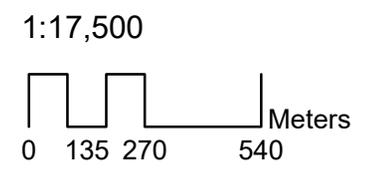
If any evidence of environmental impact is visible during construction within the Project Area, particularly near the areas listed or near electrical equipment, transformers or capacitors, the contractor must follow The City's contamination discovery procedures, the Environmental Construction Operation (ECO) plan and the MMP. Environmental impacts could include stained or discoloured soil, fill with debris or household garbage, odours, sheens and/or abandoned pipes or tanks. Though no specific electrical infrastructure was identified to contain PCBs, contamination can vary dependent on the dates of manufacturing of the infrastructure. Care should be taken near electrical equipment and the demolition, construction or replacement of any electrical infrastructure should be completed by a qualified professional.

Document: \\C:\CYCLE\ER\ISL_Globall\Projects\270000\274002\2422_CHB_EPS\01_Disciplines\12_Environment\Phase I_ESA\GIS (derived from P\NSA\Site Plan.mxd Date: 2015-09-12

Figure 5.1



- Legend**
- Study Area
 - Project Area



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**
AREAS OF POTENTIAL
ENVIRONMENTAL CONCERN





6.0 List of Professionals

Ms. Jasmine Skirten of ISL conducted the site visit and records searches.

Ms. Laura York, BSc. of ISL conducted the site visit.

Mr. Soren Poschmann, P.Geo., of ISL was the author of the report. Mr. Poschmann is a hydrogeologist with over 12 years' experience in environmental consulting.

Resumes are included in Appendix G.



7.0 Disclaimer

This document entitled “Country Hills Boulevard Functional Planning Study – Phase I Environmental Site Assessment” has been prepared by ISL Engineering and Land Services Ltd. (ISL) for the use of The City of Calgary and their agents. The City of Calgary shall always be entitled to fully use and rely on this report, including all attachments, figures, and schedules, for the specific purpose for which the report was prepared, in each case notwithstanding any provision, disclaimer, or waiver in the report that reliance is not permitted.

The City of Calgary shall at all times be entitled to provide copies of the report to City Council, City of Calgary regulatory boards, City of Calgary employees, officers, agents, affiliates, advisors, consultants, parties contracting with The City of Calgary, lenders and assignees and other governmental authorities and regulatory bodies having jurisdiction, each of whom shall also be similarly entitled to fully use and rely on the report in the same manner and to the same extent as The City of Calgary for the specific purpose for which the report was prepared.

The information and data provided herein represent ISL’s professional judgment at the time of preparation. ISL denies any liability whatsoever to any other parties who may obtain this report and use it, or any of its contents, without prior written consent from ISL. Information provided by third parties is believed to be accurate, although is not guaranteed.

ISL Engineering and Land Services Ltd.

Author:

Soren Poschmann, P.Geo.
Lead, Hydrogeology



■ 8.0 References

Abacus Datagraphics. (2019). *AbaData*. Retrieved September 2019, from <http://abadata.ca/AbaData2>

Alberta Environment and Parks. (2016). *Alberta Environmental Site Assessment Standard*.

Alberta Environment and Parks. (2019). *Environmental Site Assessment Repository*. Retrieved August 2019, from <http://www.esar.alberta.ca/esarmain.aspx>

CSA Standards. (2016). Phase I *Environmental Site Assessment* ; Z768-01 (reaffirmed 2016). Canadian Standards Association.

Government of Canada. (2018). *Electrical contractors and PCB regulations*. Retrieved from <https://www.canada.ca/en/environment-climate-change/services/pollutants/pcb-in-environment/electrical-contractors-regulations.html>.

The City of Calgary. (2016). Phase I *Environmental Site Assessment Terms of Reference*.



APPENDIX
Environmental Risk Information Services
Physical Setting Report

A



Property Information

Order Number:	20190808157p
Date Completed:	August 12, 2019
Project Number:	27422
Project Property:	Country Hills Boulevard Widening Country Hills Boulevard Calgary AB
Coordinates:	
Latitude:	51.1542233
Longitude:	-114.02030418
UTM Northing:	5671270.48083 Metres
UTM Easting:	708161.562213 Metres
UTM Zone:	UTM Zone 11U
Elevation:	1,080.99 m
Slope Direction:	S

Property Information.....	1
Topographic Information.....	2
Hydrologic Information.....	16
Geologic Information.....	23
Soil Information.....	40
Wells and Additional Sources.....	72
Report Summary.....	76
Detail Report.....	78
Radon Information.....	140
Appendix.....	141
Liability Notice.....	143

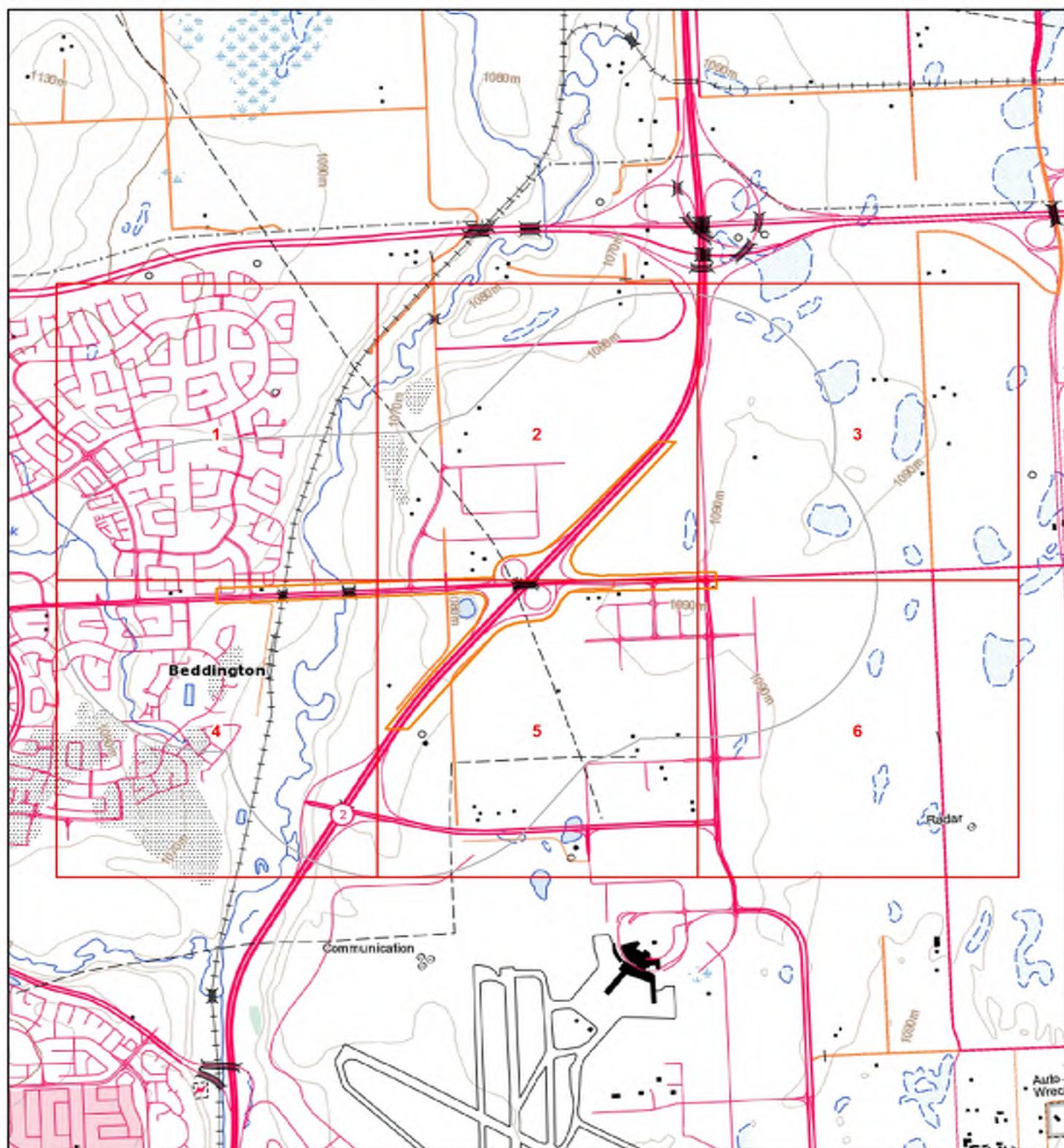
The ERIS **Physical Setting Report - PSR** provides comprehensive information about the physical setting around a site and includes a complete overview of topography as well as hydrologic, geologic and soil characteristics. The location and detailed attributes of oil and gas wells, water wells, and radon are also included for review.

The compilation of both physical characteristics of a site and additional attribute data is useful in assessing the impact of migration of contaminants and subsequent impact on soils and groundwater.

Disclaimer

This Report does not provide a full environmental evaluation for the site or adjacent properties. Please see the terms and disclaimer at the end of the Report for greater detail.

Topographic Information



Topographic Map

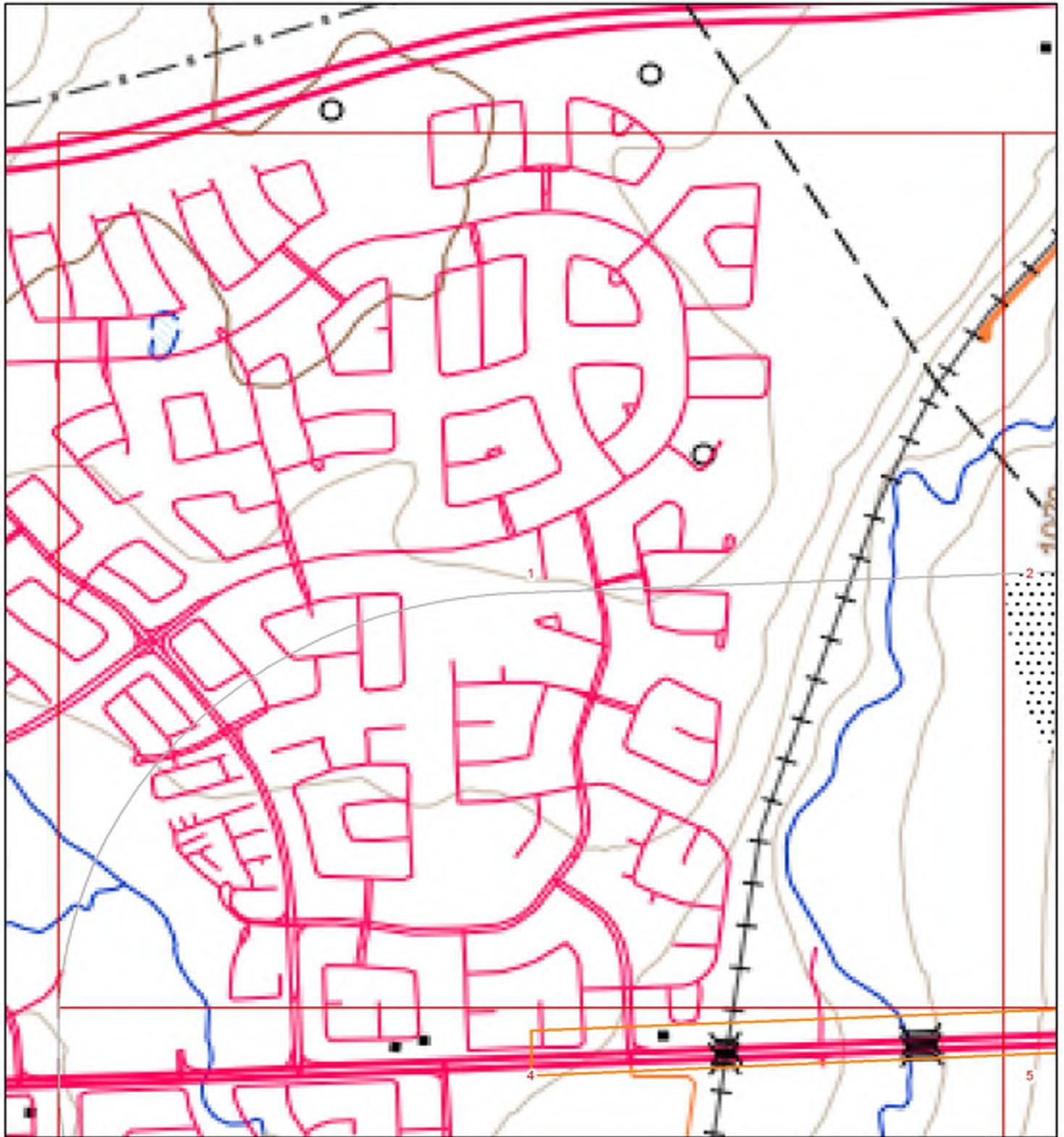
Address: Country Hills Boulevard, Calgary, AB

Data source: Toporama (1:50K) by Natural Resource Canada. Publication date: 2013-07-19

Legend available at ftp://ftp.geogratis.gc.ca/pub/nrcan_mcan/raster/toporama/doc/Toporama_en_Legend.pdf

ERIS
ENVIRONMENTAL REHABILITATION SERVICES



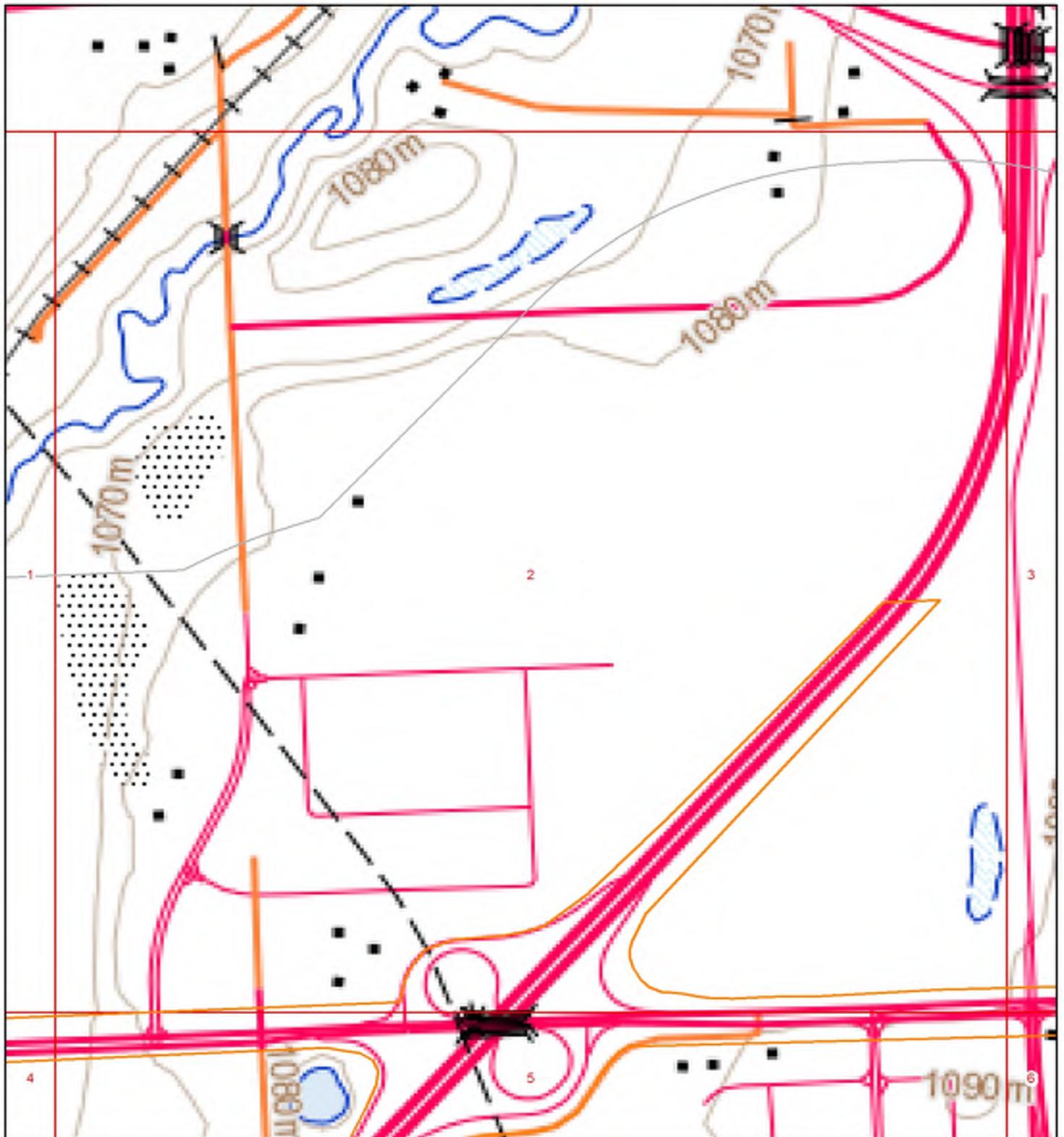


Topographic Map - Page 1

Map Centre Address: 820 Don Mills Rd, Toronto, ON

Data source: Toporama (1:50K) by Natural Resource Canada.





Topographic Map - Page 2

Map Centre Address: 820 Don Mills Rd, Toronto, ON

Data source: Toporama (1:50K) by Natural Resource Canada.



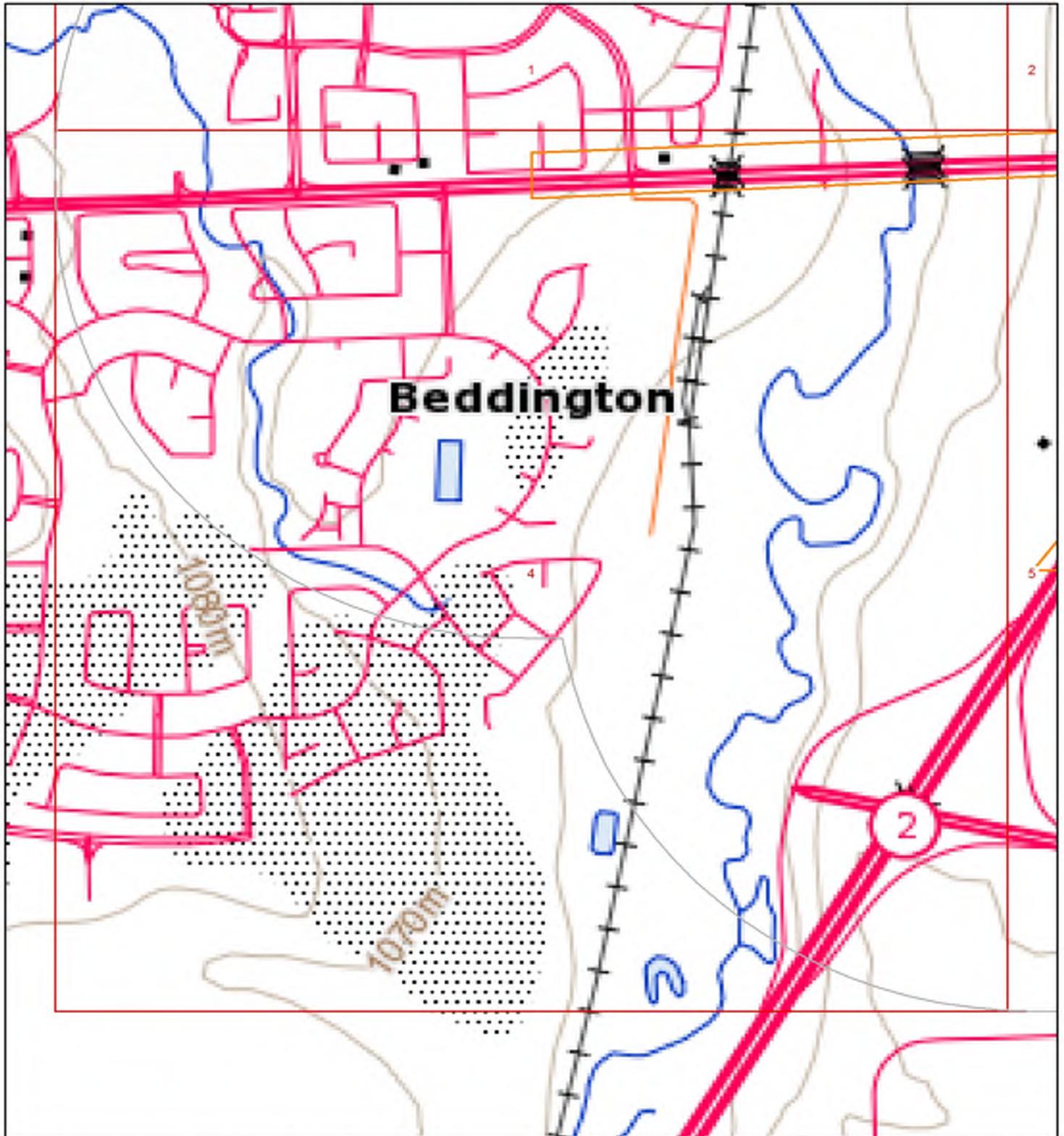


Topographic Map - Page 3

Map Centre Address: 820 Don Mills Rd, Toronto, ON

Data source: Toporama (1:50K) by Natural Resource Canada.



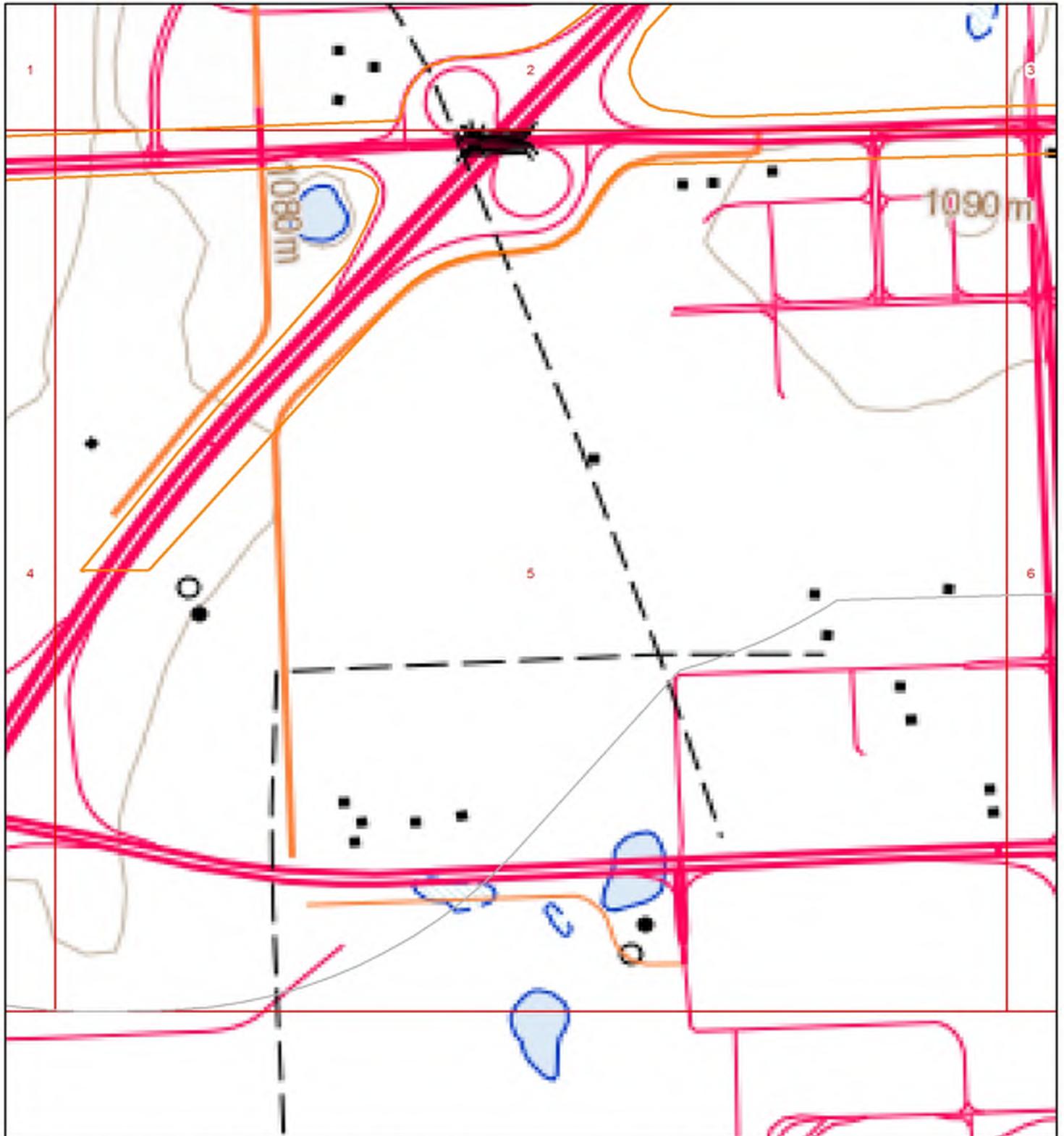


Topographic Map - Page 4

Map Centre Address: 820 Don Mills Rd, Toronto, ON

Data source: Toporama (1:50K) by Natural Resource Canada.



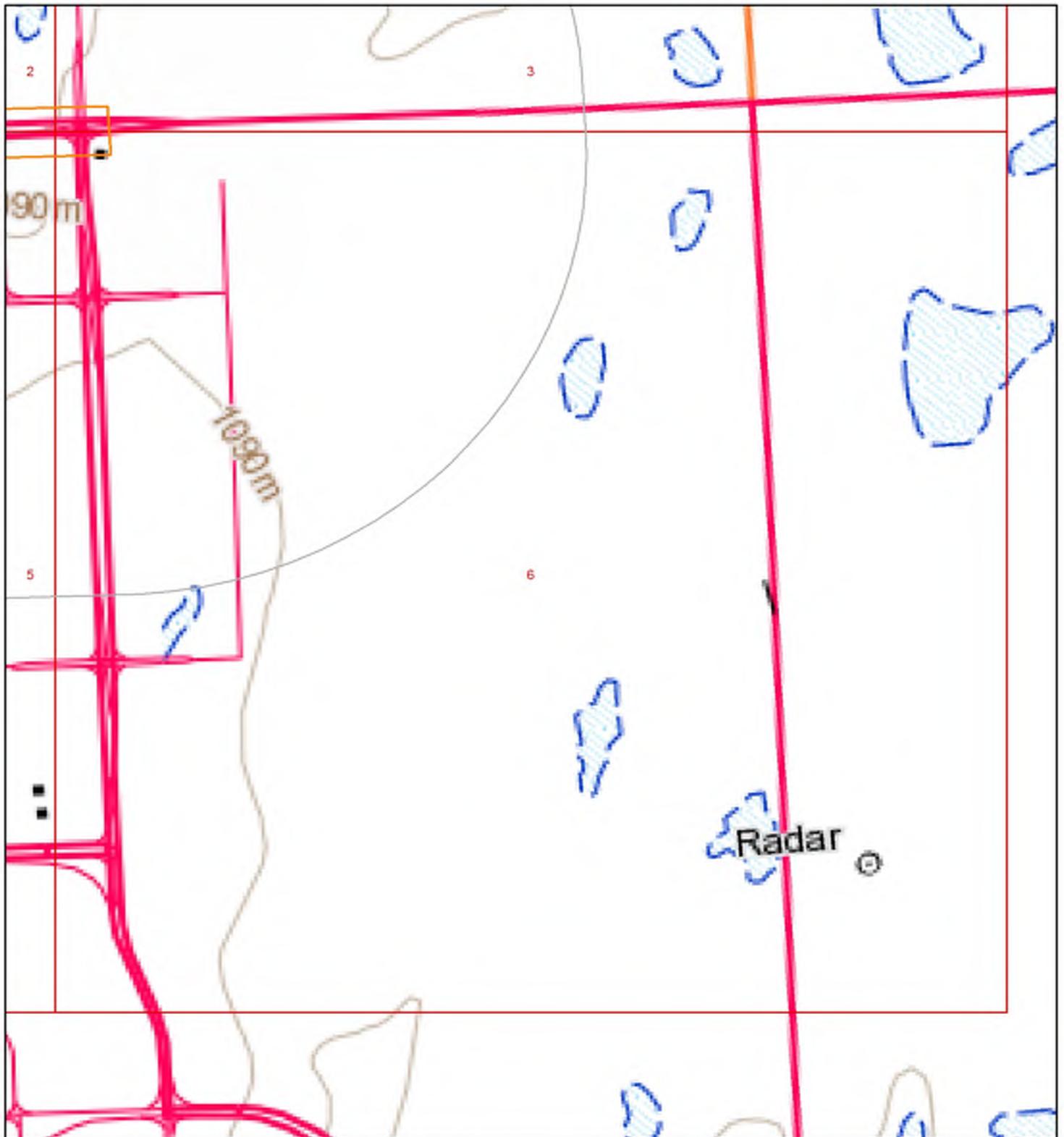


Topographic Map - Page 5

Map Centre Address: 820 Don Mills Rd, Toronto, ON

Data source: Toporama (1:50K) by Natural Resource Canada.





Topographic Map - Page 6

Map Centre Address: 820 Don Mills Rd, Toronto, ON

Data source: Toporama (1:50K) by Natural Resource Canada.

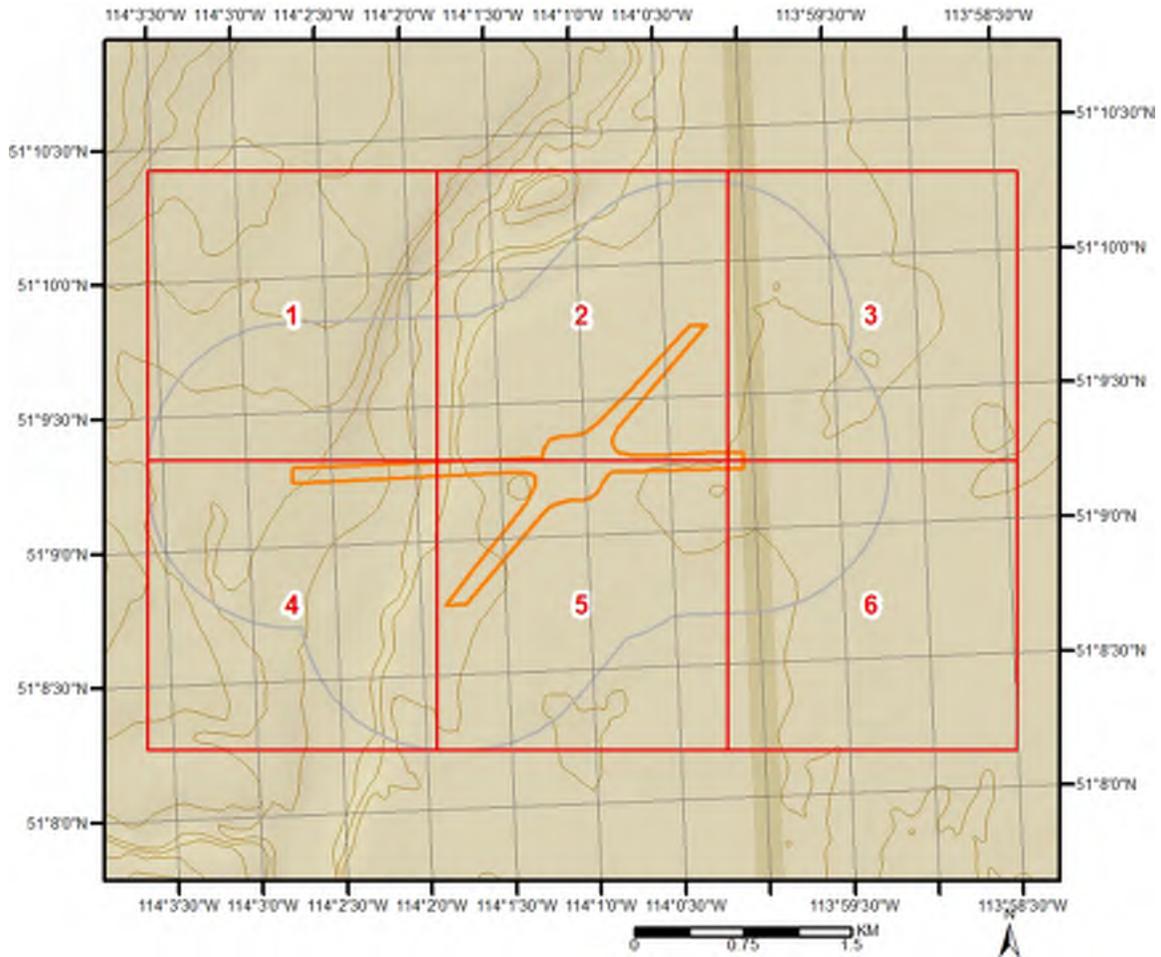


Topographic Information

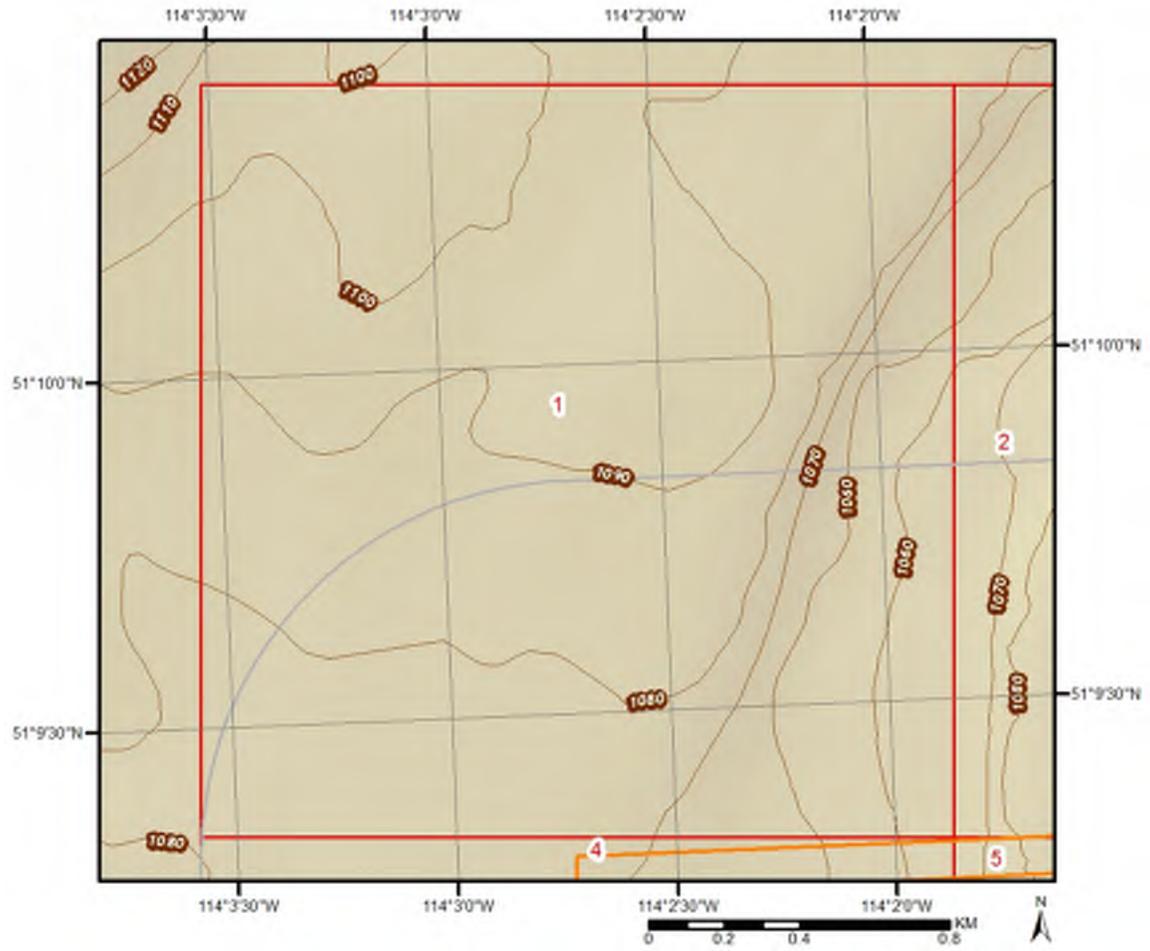
The previous topographic map(s) show general topographic information in the surrounding area of the project property, using Toporama data or a provincial source when available. Below are shaded relief map(s), derived from Digital Elevation data to depict terrain in further detail.

Topographic information at project property:

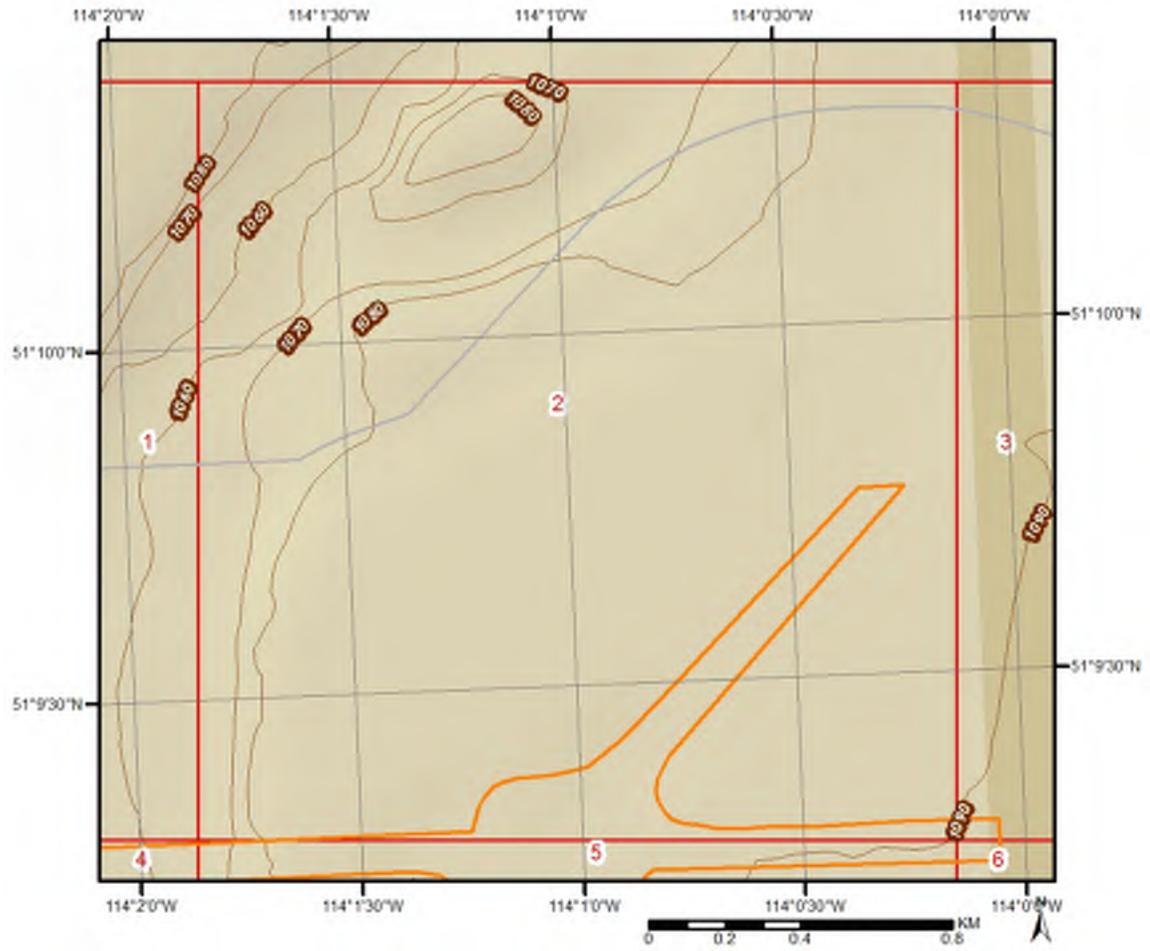
Elevation: 1,080.99 m
Slope Direction: S



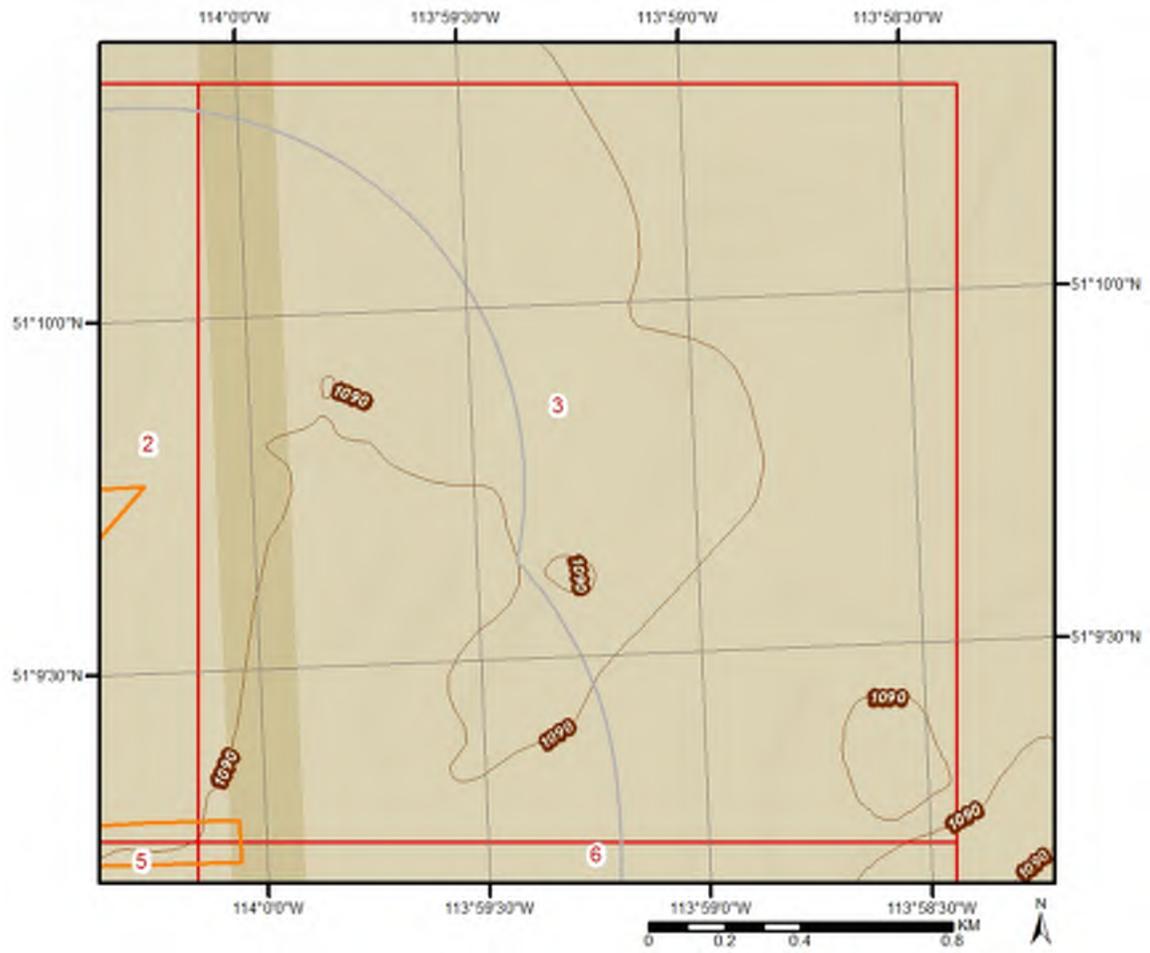
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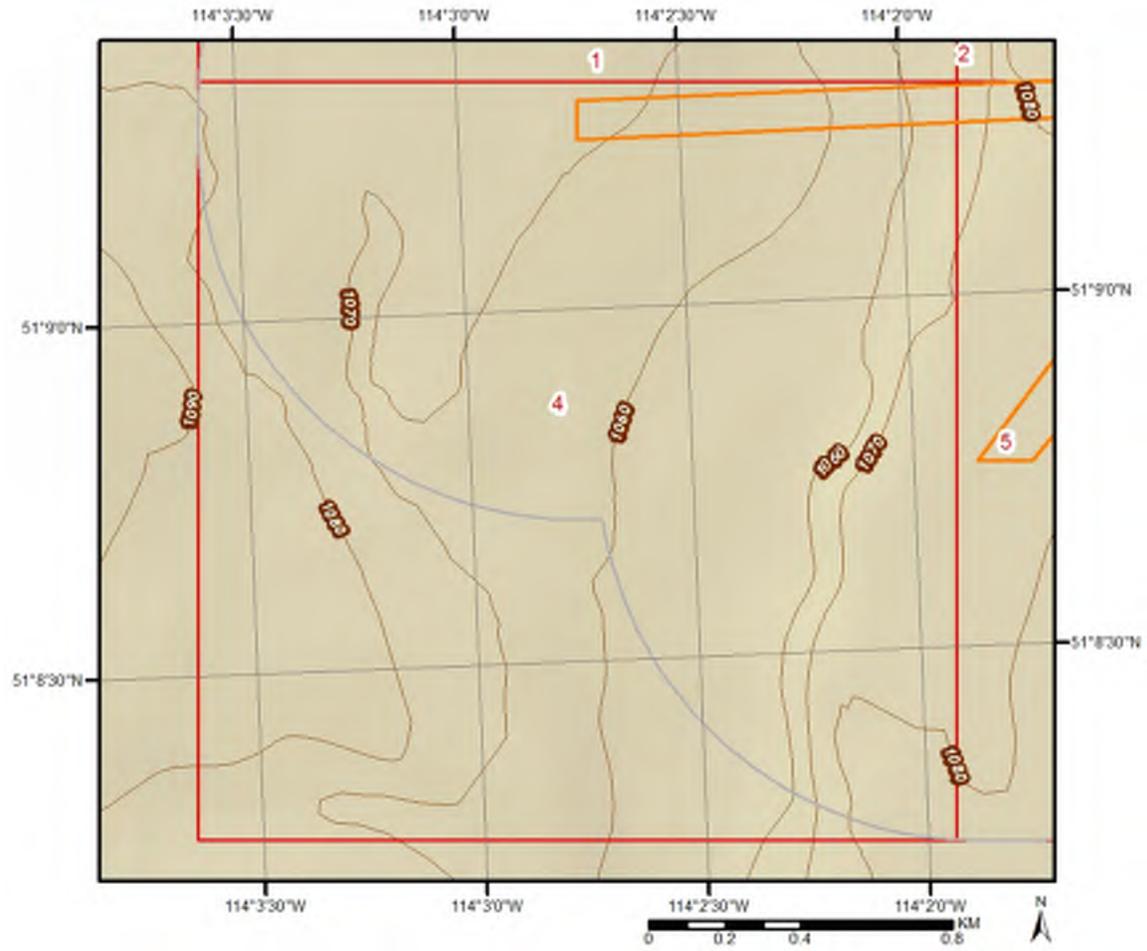
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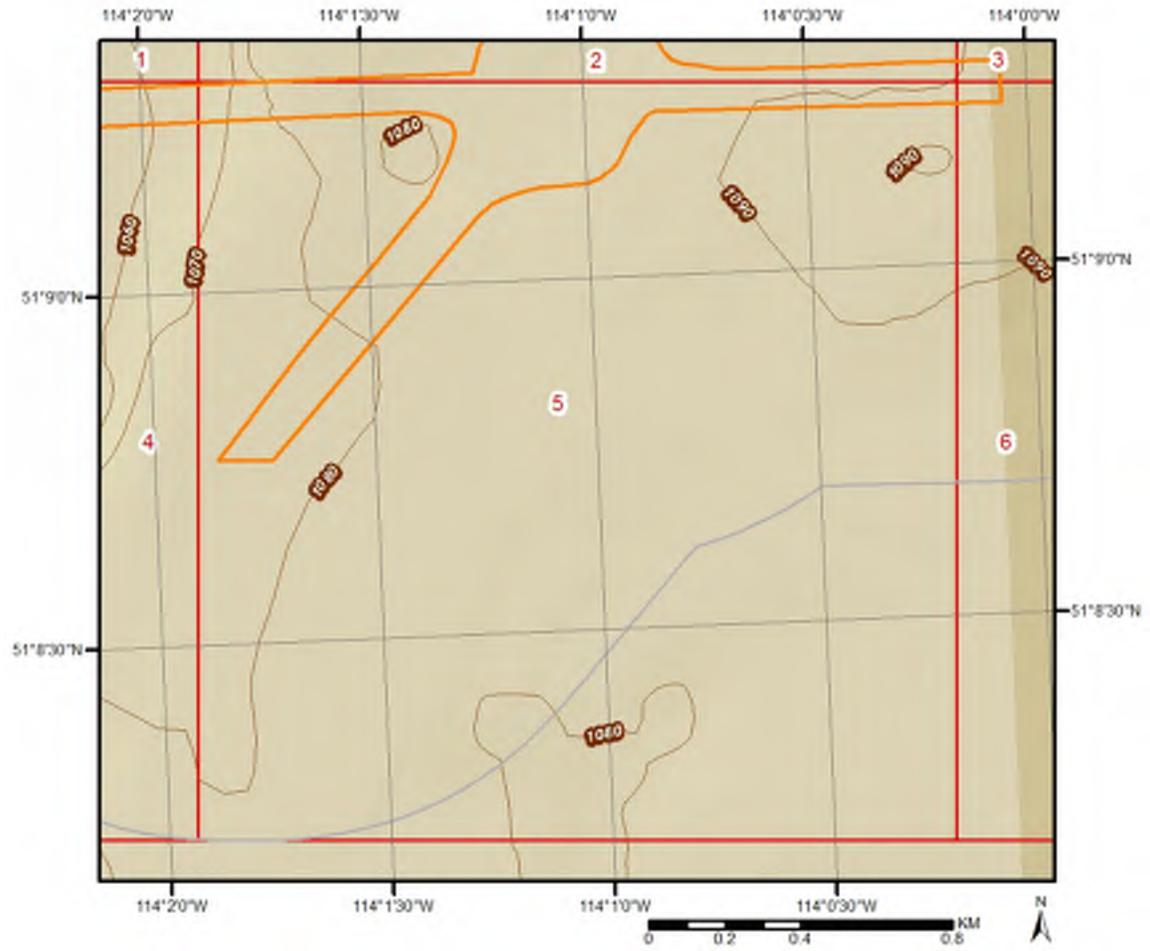
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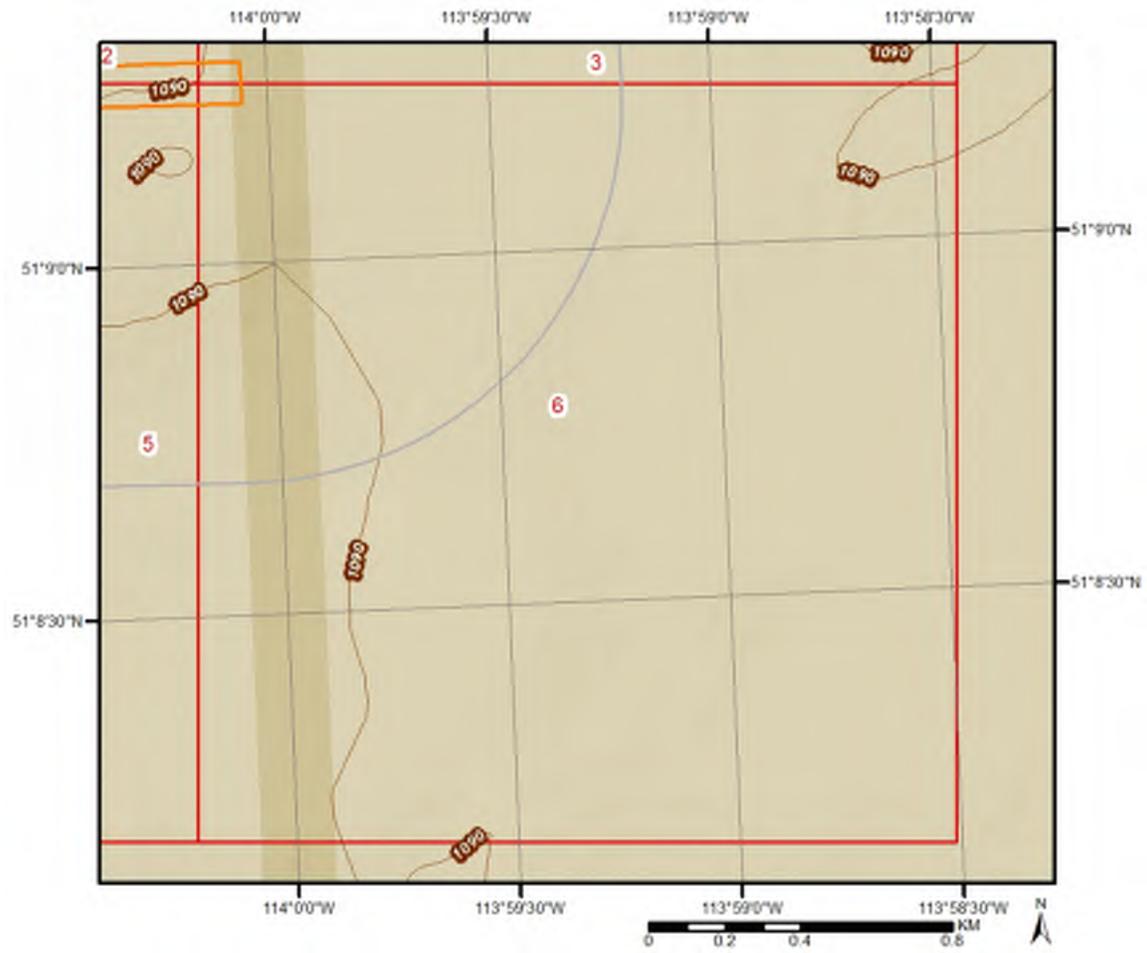
Topographic Information



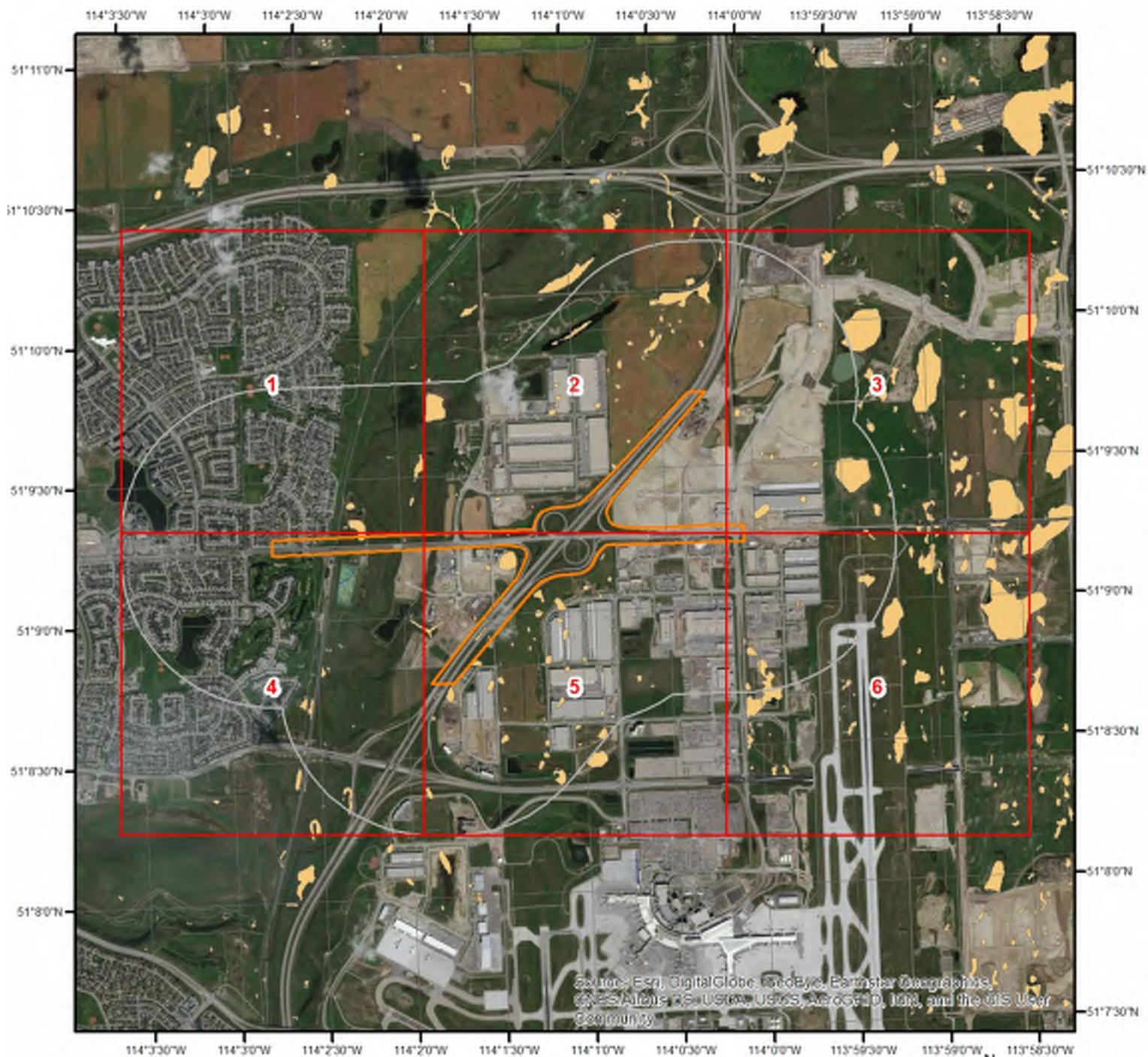
Topographic Information



Topographic Information



Hydrologic Information



Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

 Marsh



Wetland Information



Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

 Marsh

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

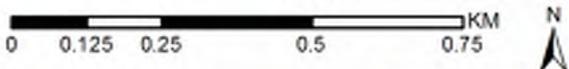
Wetland Information



Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

 Marsh



ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



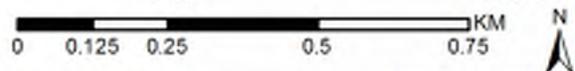
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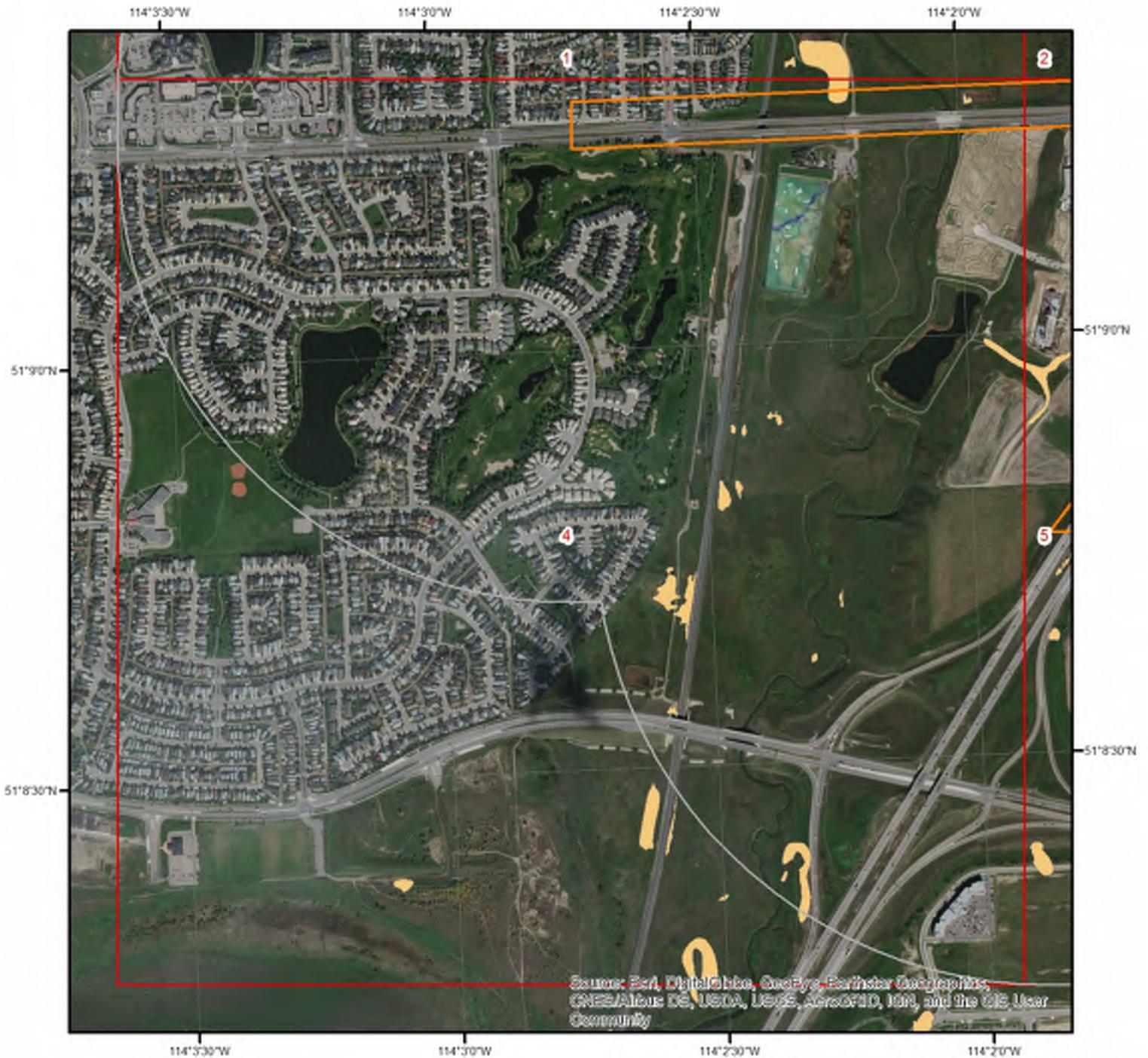
Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

 Marsh



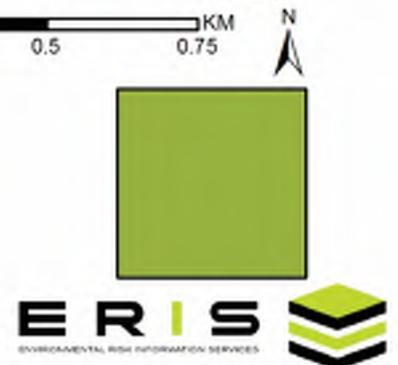
Wetland Information



Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

 Marsh



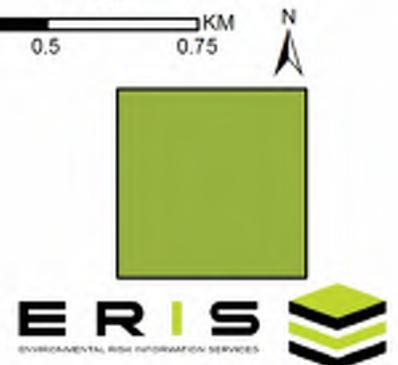
Wetland Information



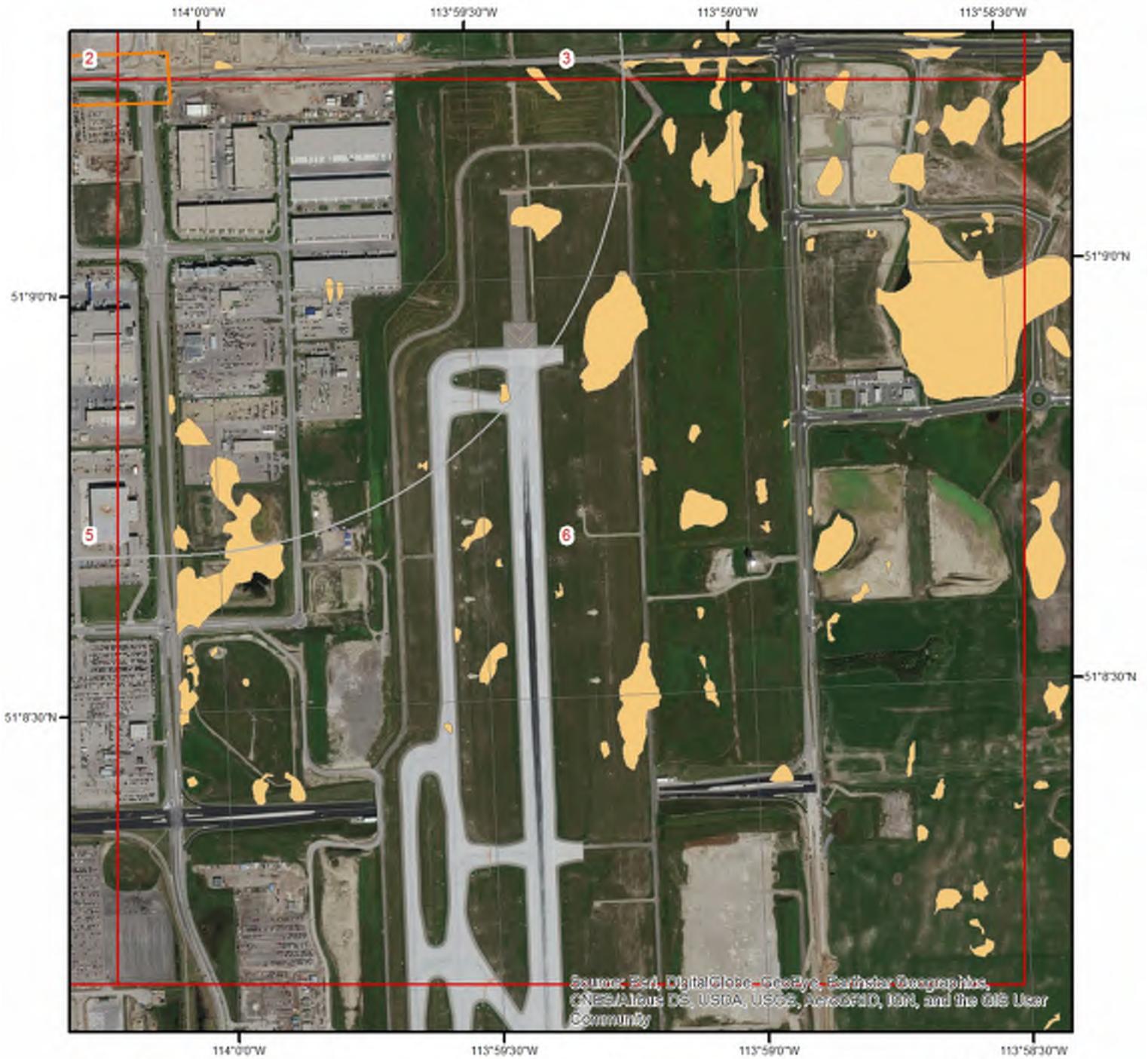
Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

 Marsh



Wetland Information



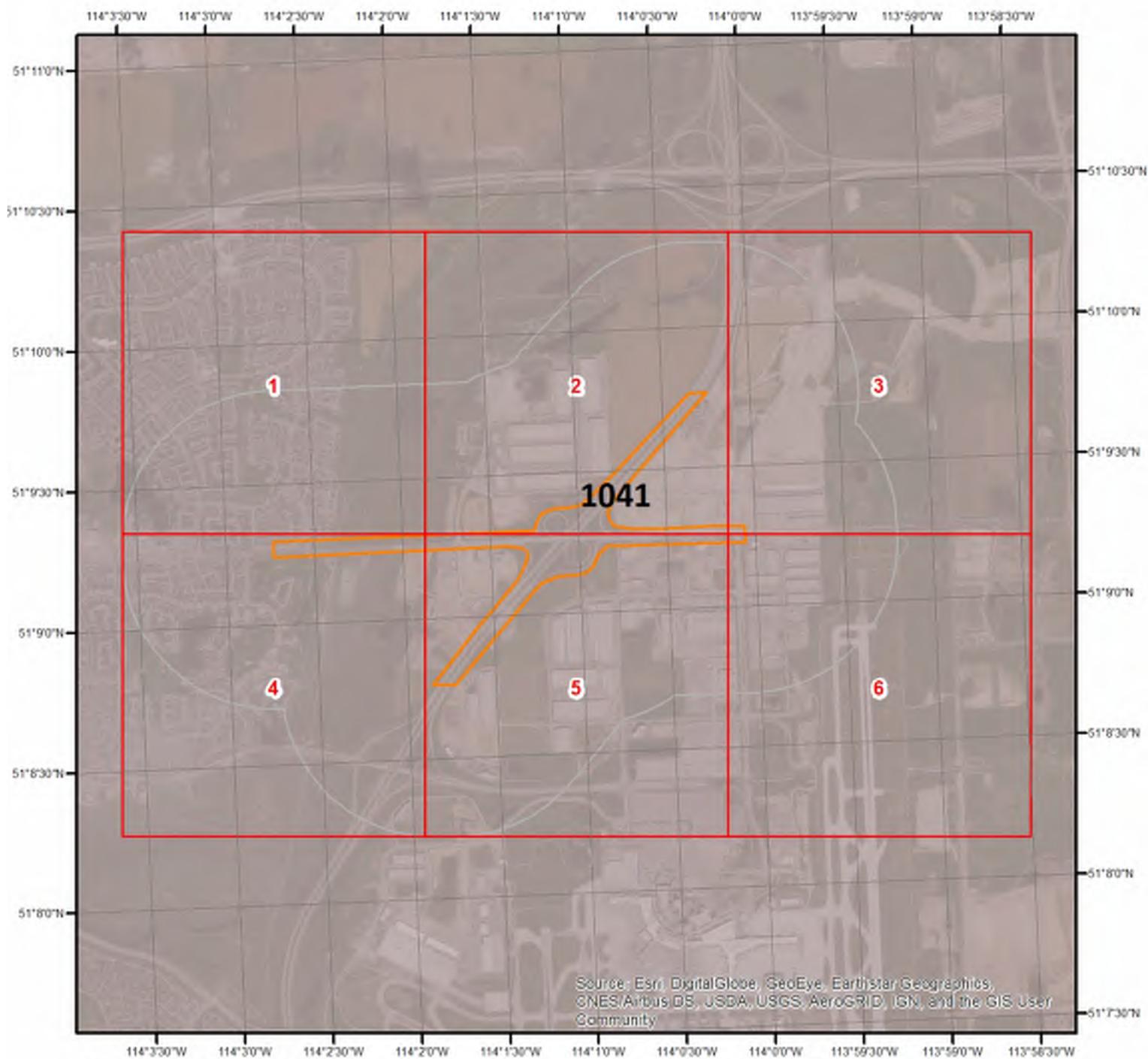
Wetland

This map shows wetland existence. Data coverage is shown to the right. Gray indicates no data available in the area.

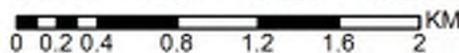
 Marsh



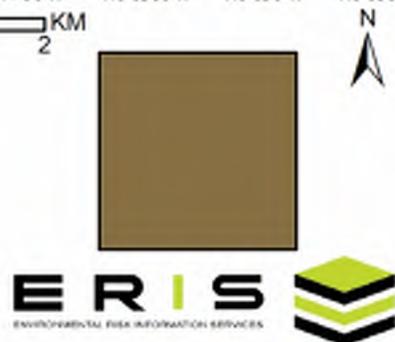
Geologic Information

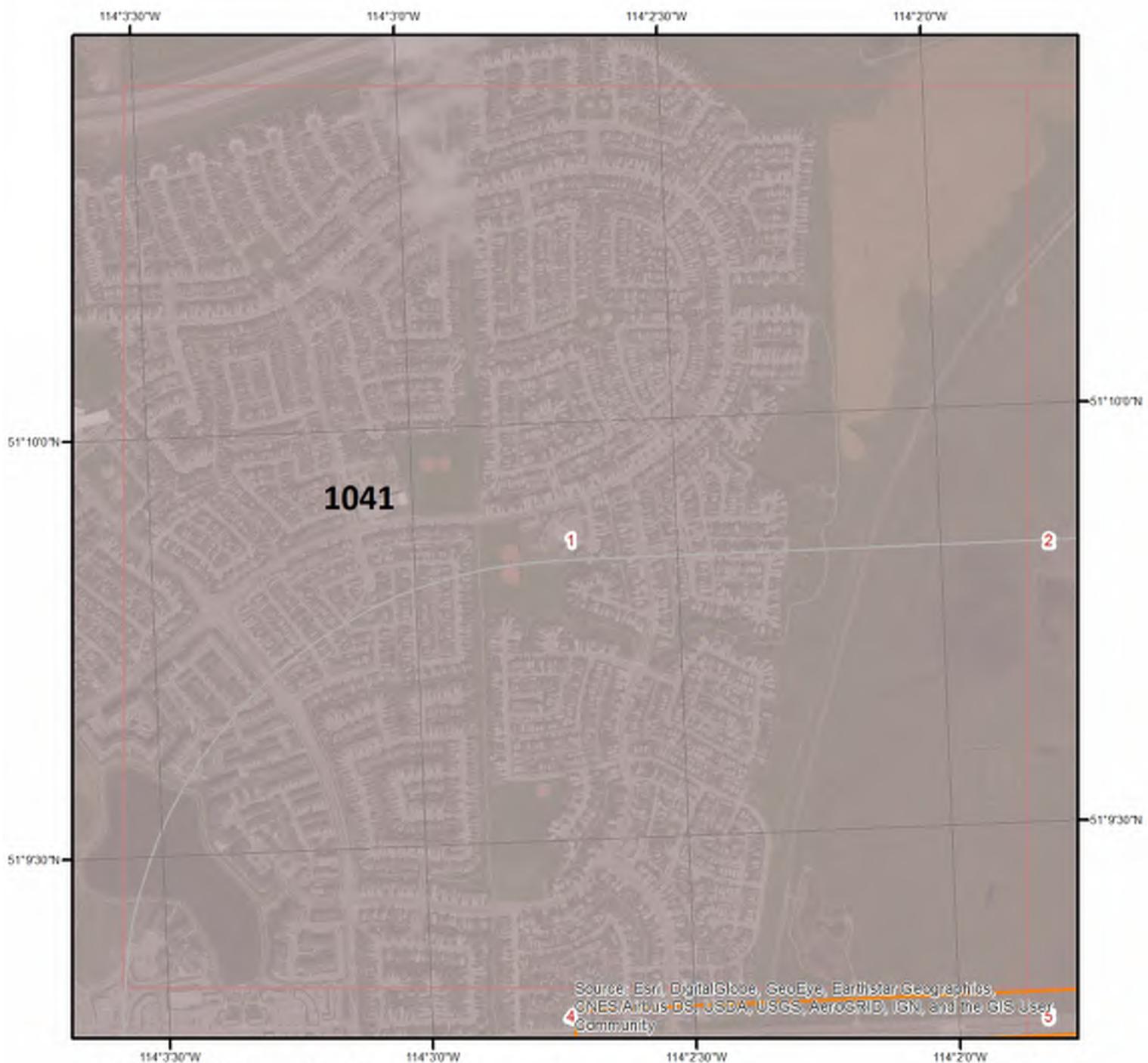


Bedrock Geology



This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.





Bedrock Geologic Types - Page 1

This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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Geologic Information



Bedrock Geologic Types - Page 2



This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

A north arrow is located to the right of the scale bar. Below it is a solid brown square. At the bottom right is the ERI S logo, which consists of the letters 'ERIS' in a bold, sans-serif font, with 'ENVIRONMENTAL RISK INFORMATION SERVICES' written in smaller text underneath. To the right of the text is a stylized logo of three stacked, slanted rectangular blocks in shades of green and yellow.

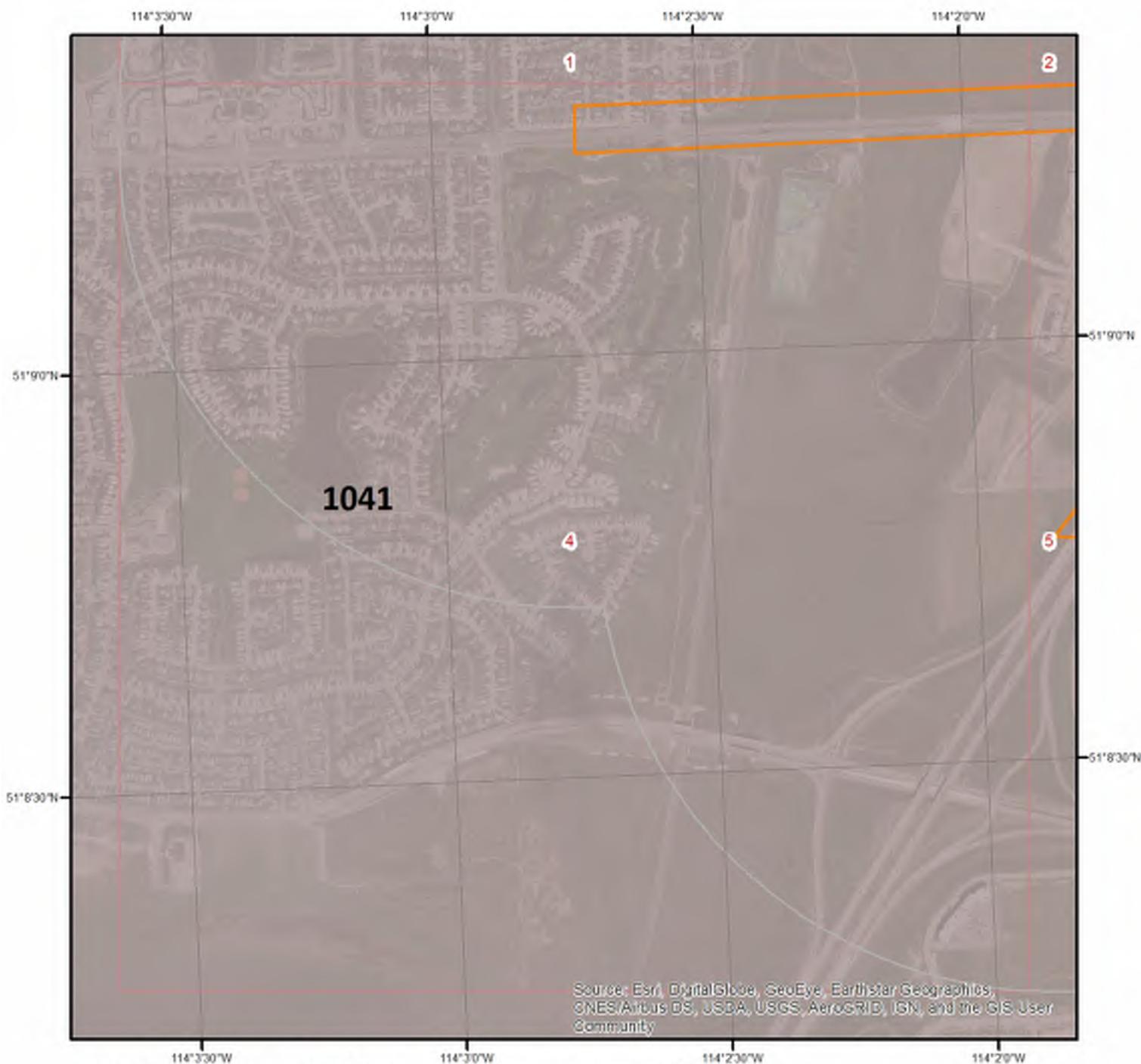


Bedrock Geologic Types - Page 3

This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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Geologic Information



Bedrock Geologic Types - Page 4

This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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Geologic Information



Bedrock Geologic Types - Page 5



This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

Geologic Information



Bedrock Geologic Types - Page 6

This map shows bedrock geologic units in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

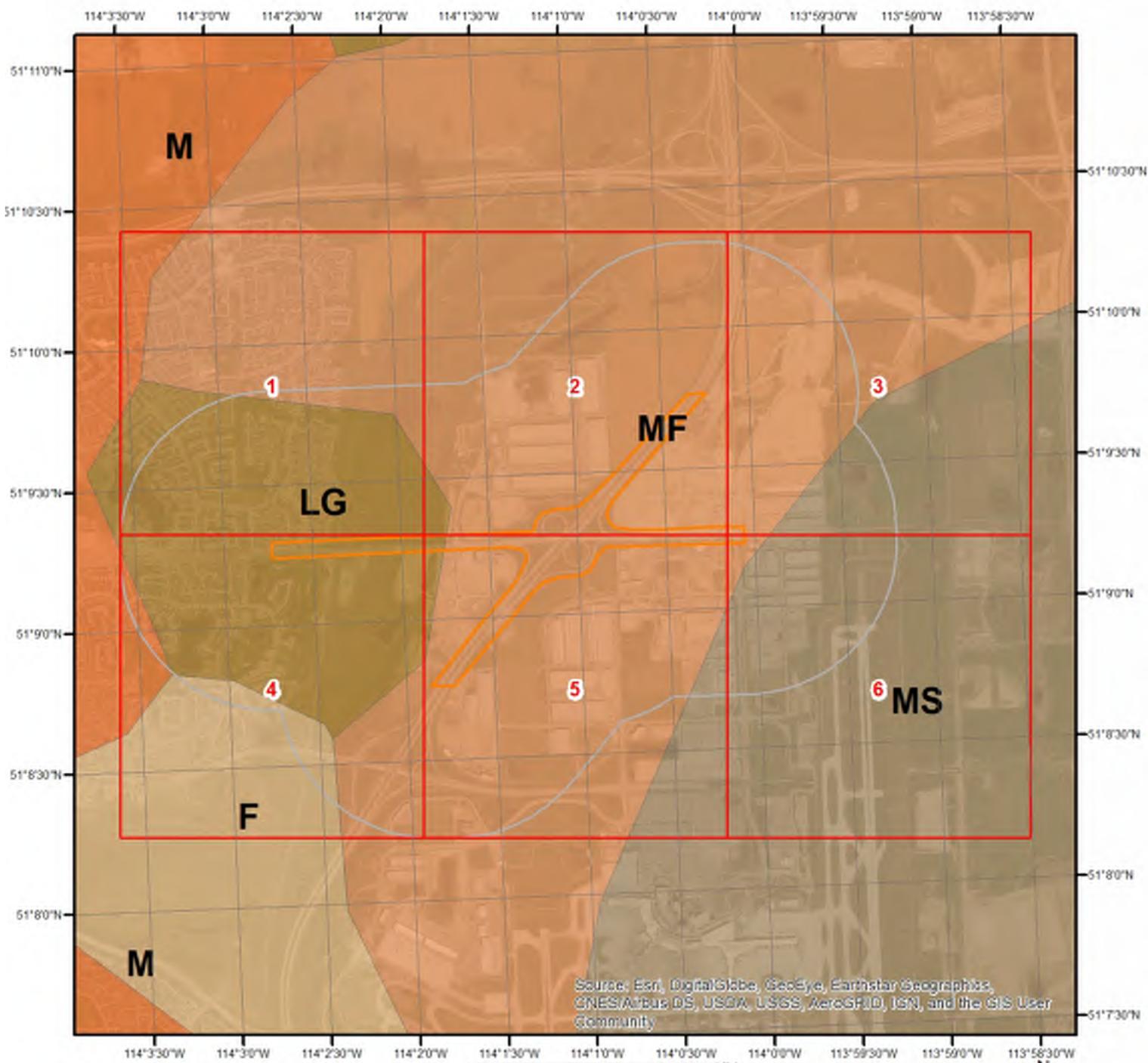
Geologic Information

Detailed bedrock geology information about each unit within the search radius is provided below.

Unit ID 1041

Unit Name:	Paskapoo Formation
Lithology:	Sandstone, siltstone, and mudstone
Environment:	Alluvial
Age:	Paleogene
Geological Regions:	Plains

Geologic Information

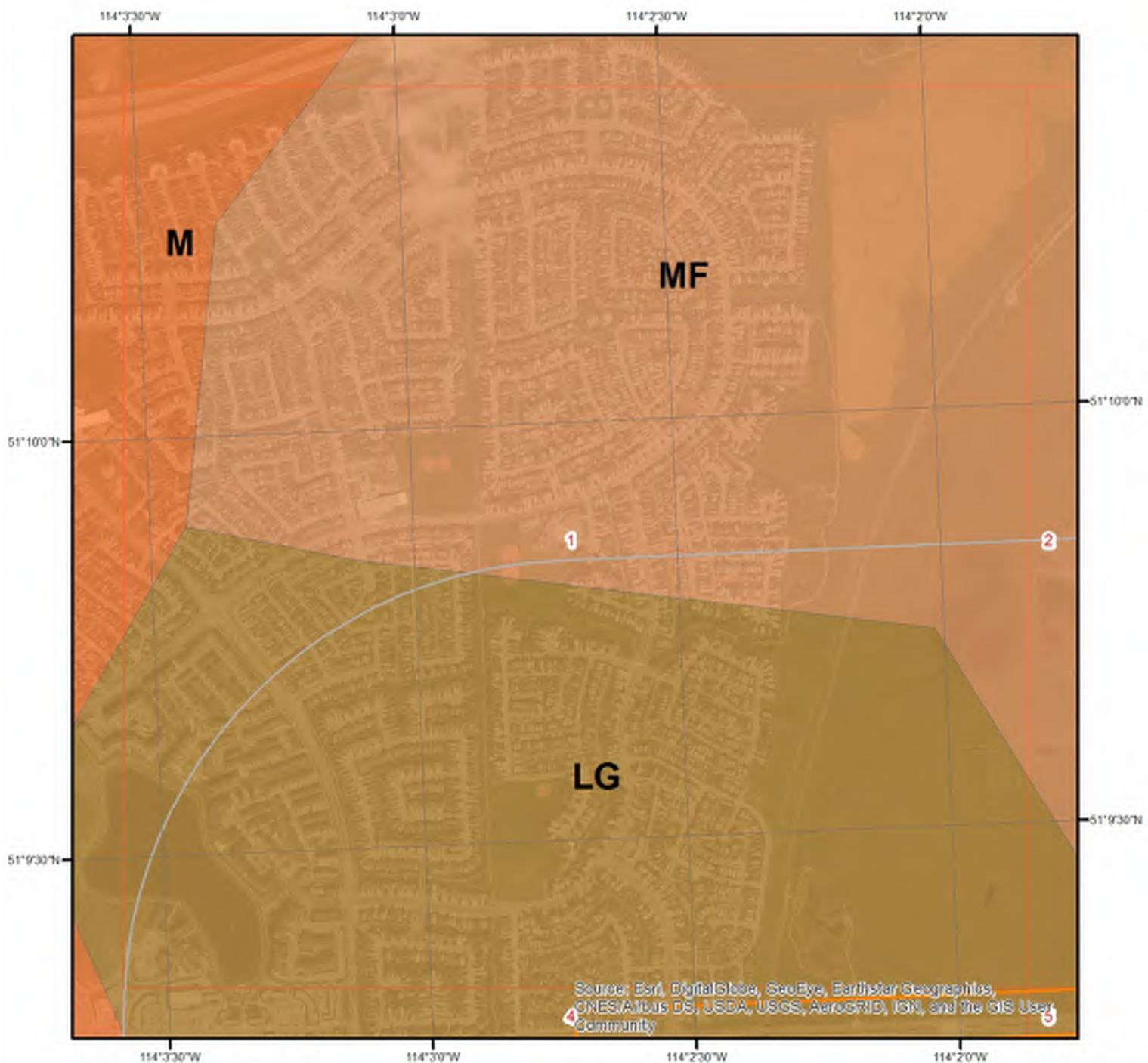


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

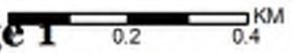
Surficial Geology

This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

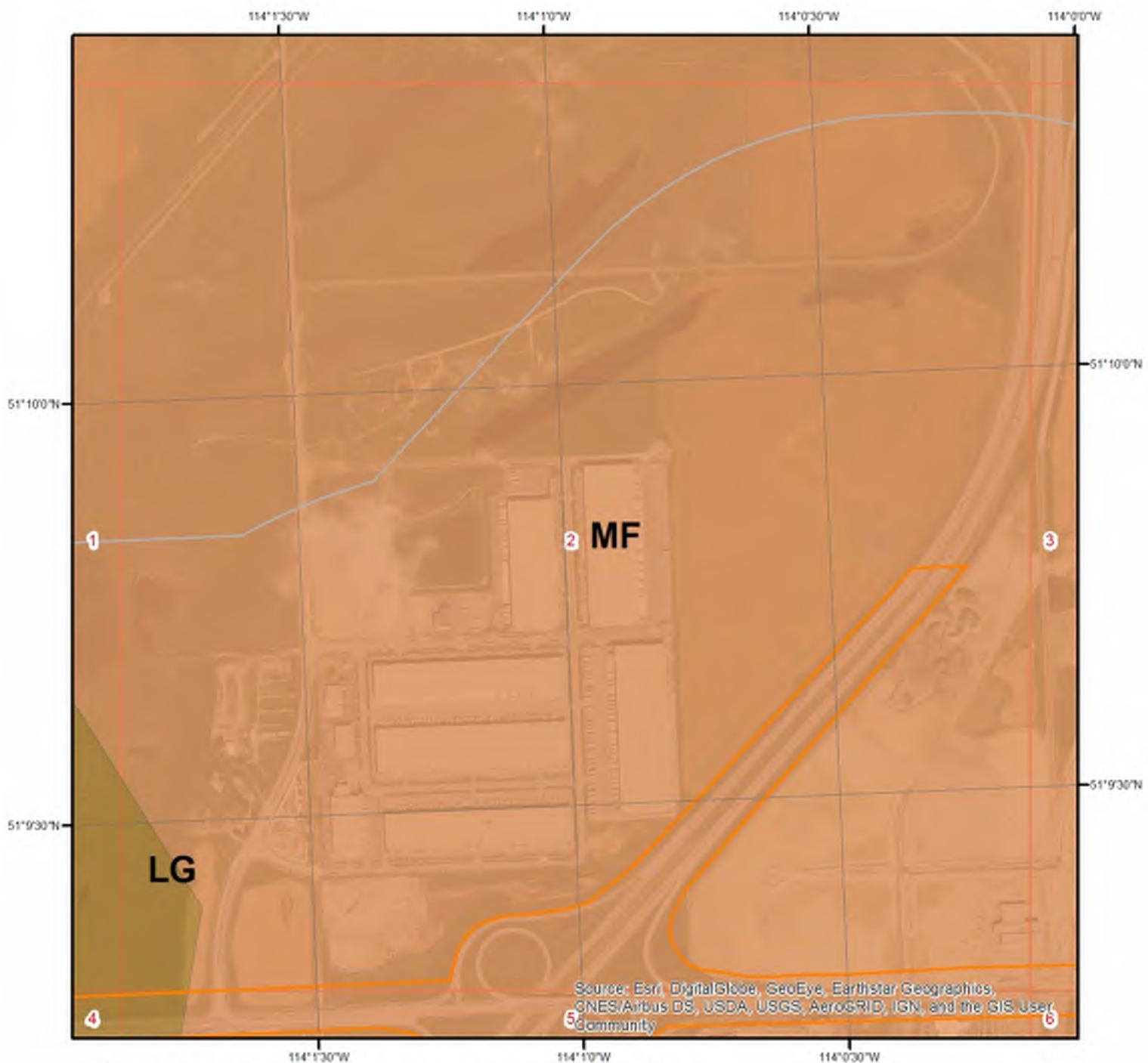




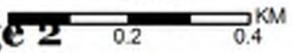
Surficial Geology - Page 1



This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

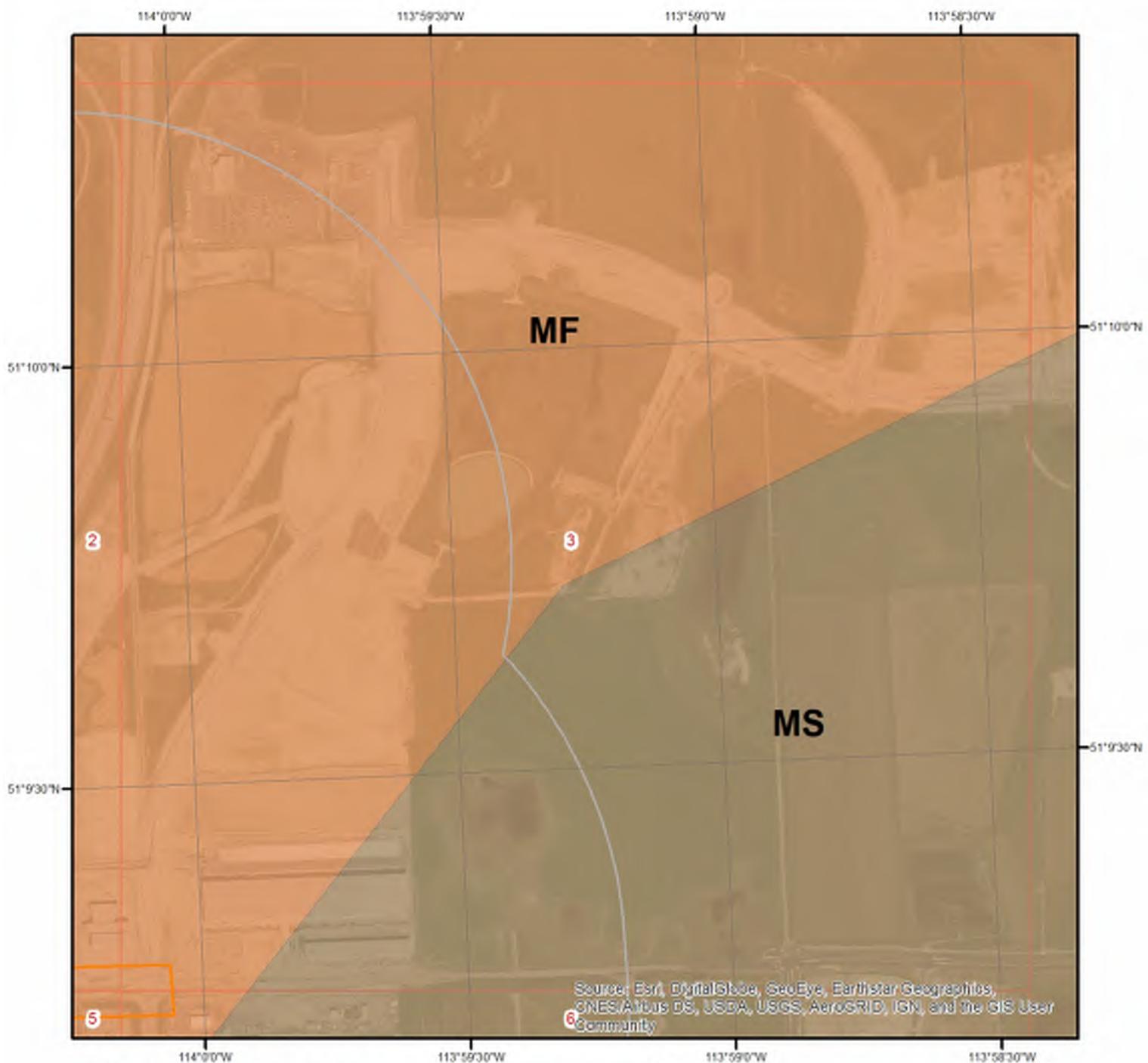


Surficial Geology - Page 2



This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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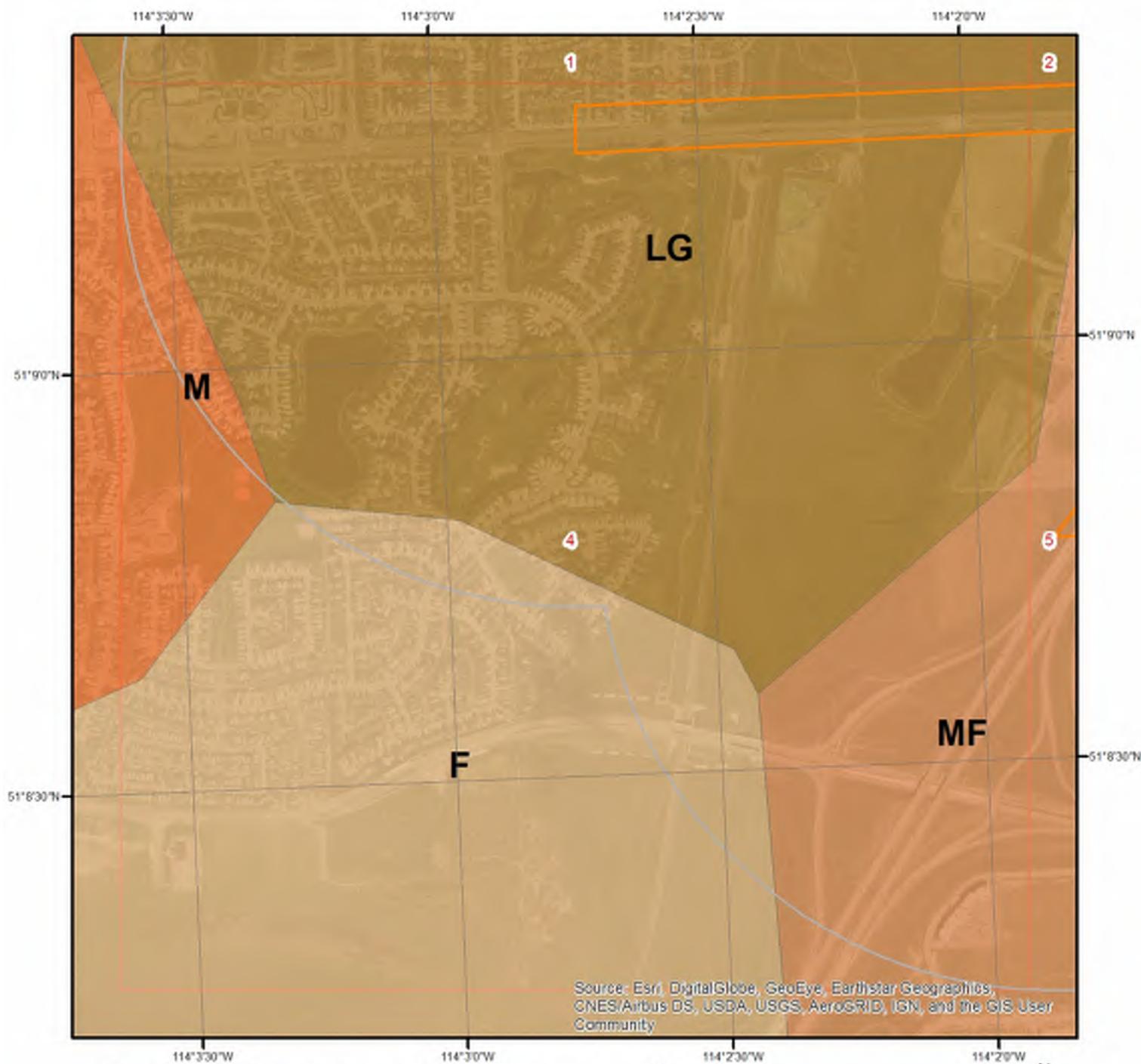


Surficial Geology - Page 3

This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.



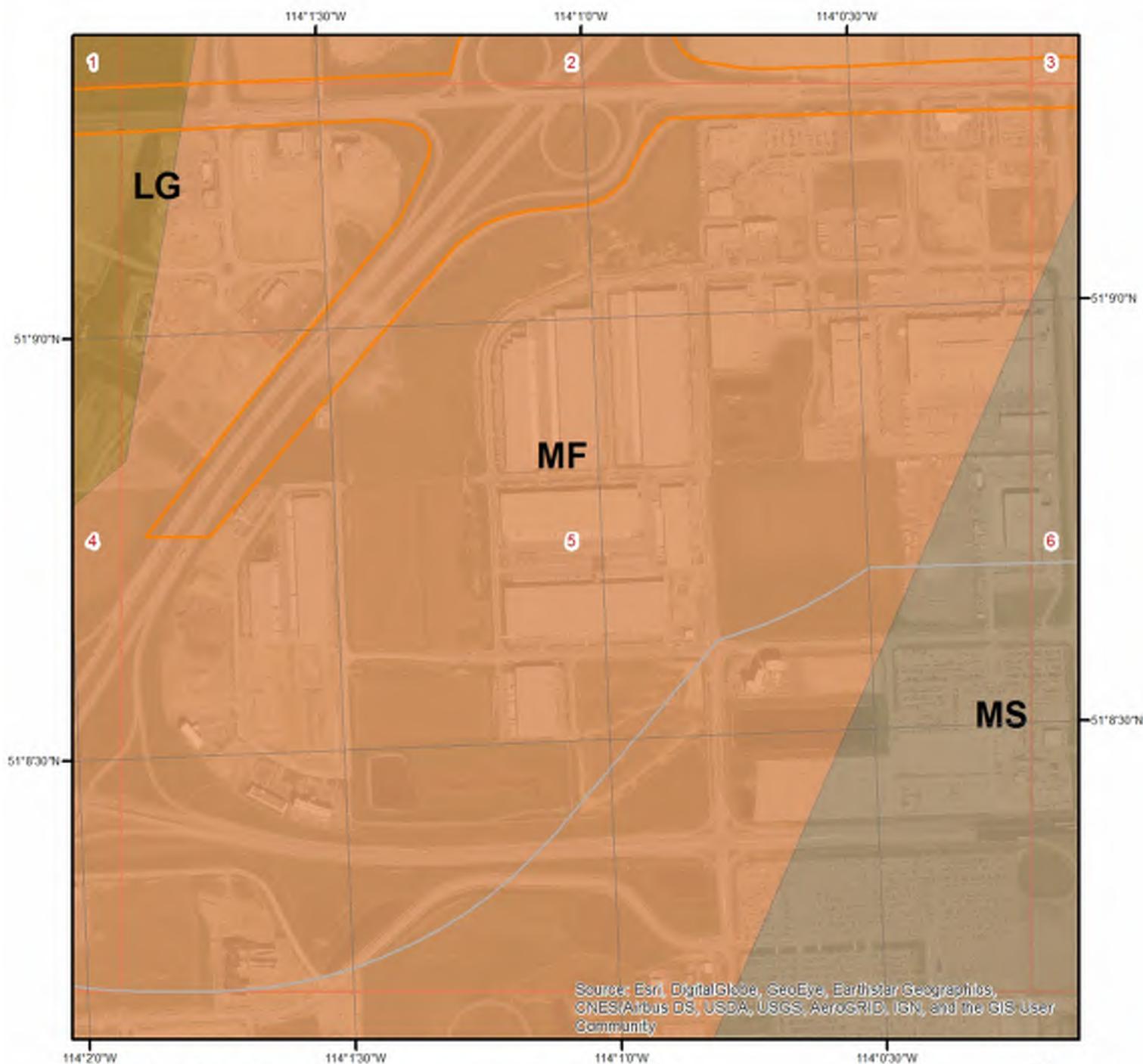
Geologic Information



Surficial Geology - Page 4

This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

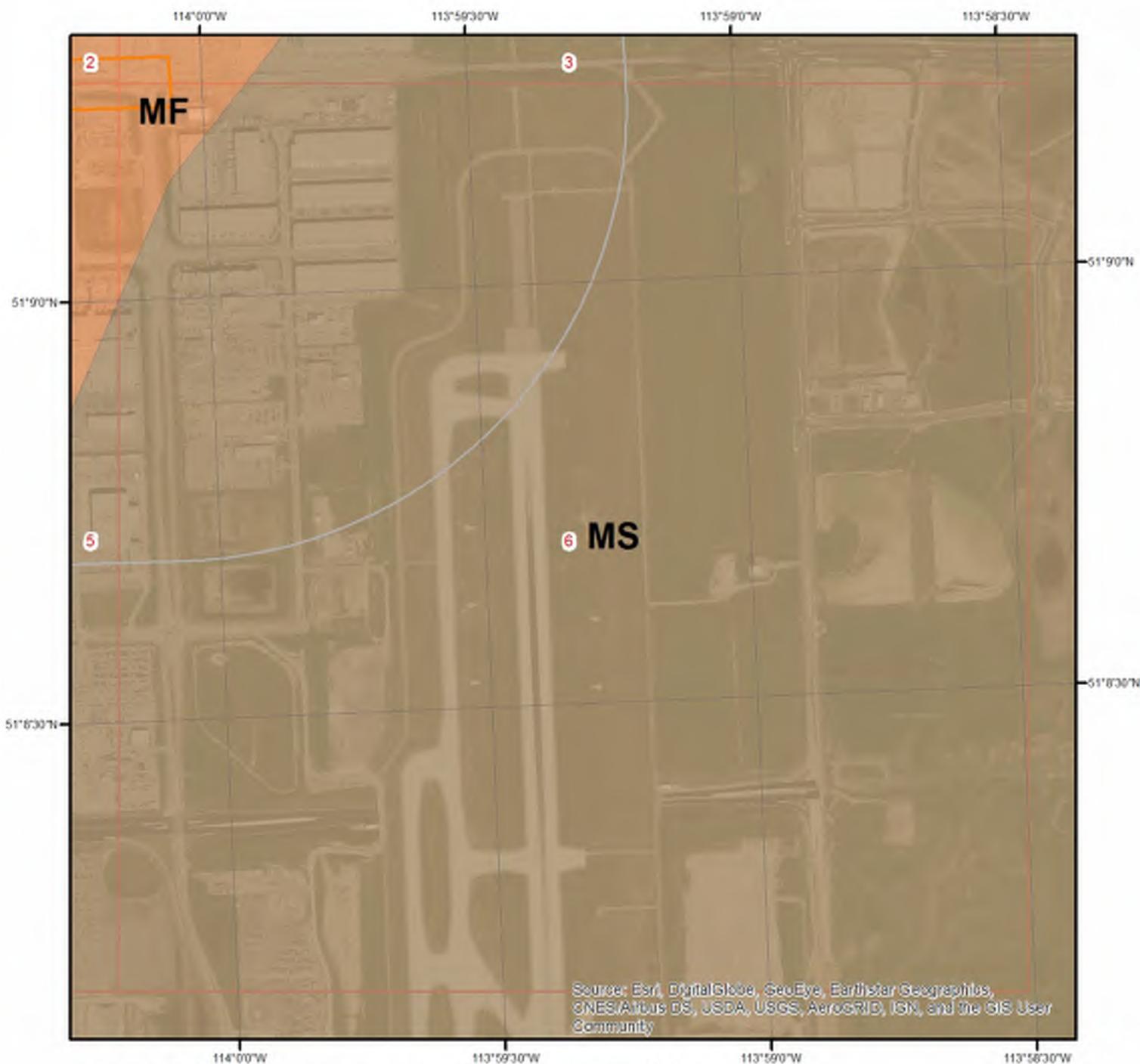




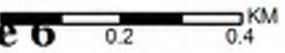
Surficial Geology - Page 5

This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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Surficial Geology - Page 6



This map shows surficial geologic labels in the area. Please refer to the report for detailed descriptions. Data coverage is shown to the right. Gray indicates no data available in the area.

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Geologic Information

Detailed surficial geology information about each unit within the search radius is provided below.

Unit ID F

Unit Name: Fluvial Deposits
Unit Description: Sediments deposited by streams and rivers; synonymous with alluvium.
Texture: Poorly- to well-sorted, stratified-to-massive sand, gravel, silt, clay and organic sediments occurring in channel and overbank deposits. In places includes a significant component of colluvial deposits as these two units are inseparable at 1 million map
Age: Holocene

Unit ID M

Unit Name: Moraine
Unit Description: Diamicton (till) deposited directly by glacial ice.
Texture: Till a mixture of clay, silt, sand and minor pebbles, cobbles and boulders. Locally, this unit may contain blocks of bedrock, pre-existing stratified sediment and till, and/or lenses of glaciolacustrine and/or glaciofluvial sediment.
Age: Pleistocene

Unit ID LG

Unit Name: Glaciolacustrine Deposits
Unit Description: Primarily fine-grained, distal sediments deposited in or along the margins of glacial lakes.
Texture: a) Offshore sediment; rhythmically laminated to massive fine sand, silt and clay, locally debris released from floating ice. b) Littoral and nearshore sediments; massive to stratified, well-sorted silty sand, pebbly sand and minor gravel.
Age: Pleistocene

Unit ID MF

Unit Name: Fluted moraine
Unit Description: Glacially streamlined sediments, mainly till. Terrain varies from alternating furrows and ridges to nearly equidimensional smoothed hills; all landforms parallel the local ice flow direction; includes flutes, drumlins and drumlinoids.
Texture: Sediment is mainly till may locally include stratified glaciolacustrine and/or glaciofluvial sediments.
Age: Pleistocene

Unit ID MS

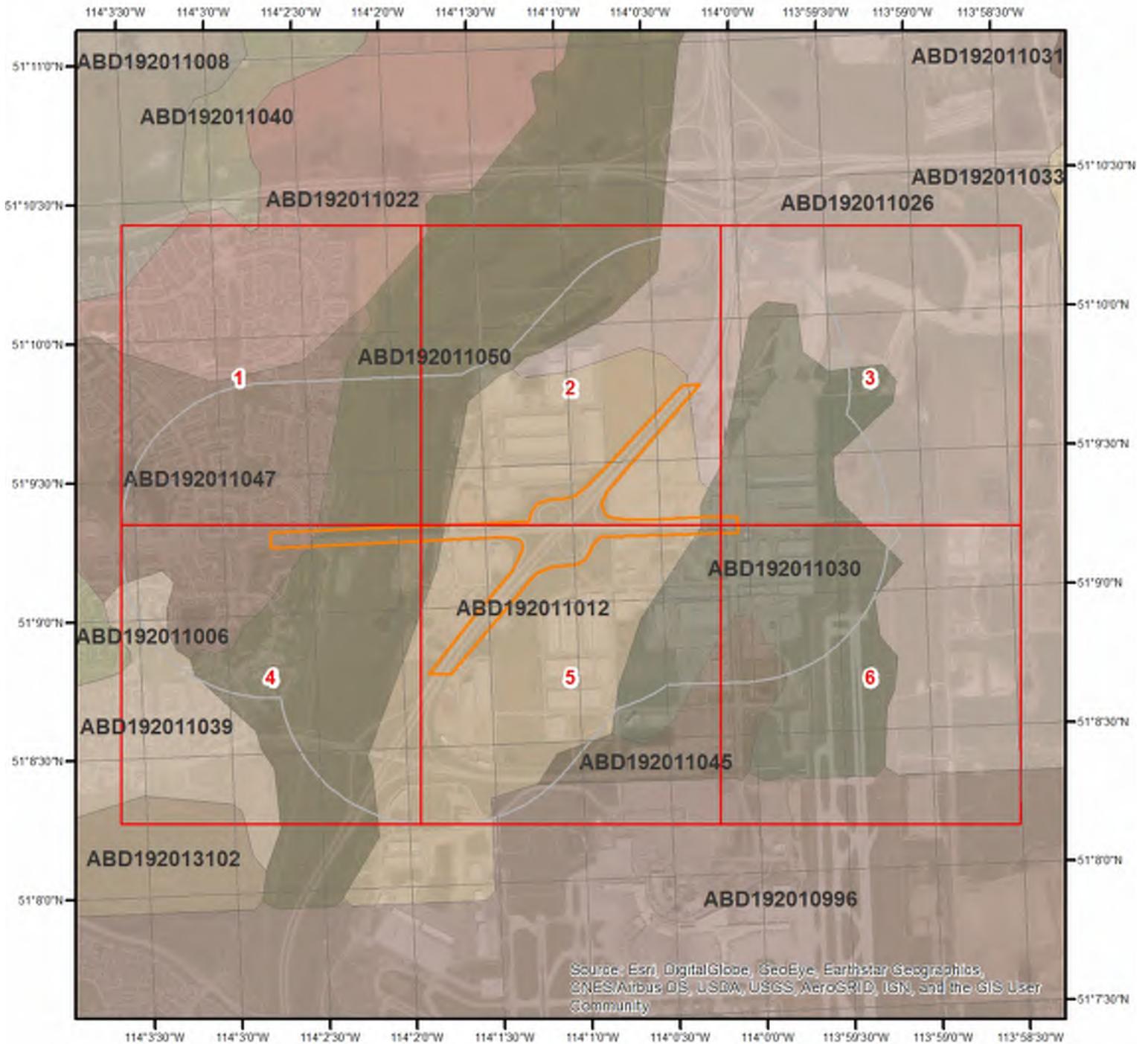
Unit Name: Stagnant Ice Moraine
Unit Description: Sediments resulting from the collapse and slumping of englacial and supraglacial debris in response to the melting of buried stagnant ice near the glacial margin. Characterized by low to high-relief hummocky topography.
Texture: Sediment is mainly till but locally includes stratified glaciolacustrine or glaciofluvial sediments.

Geologic Information

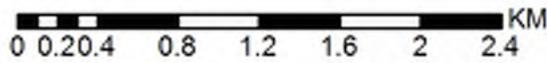
Age:

Pleistocene

Soil Information



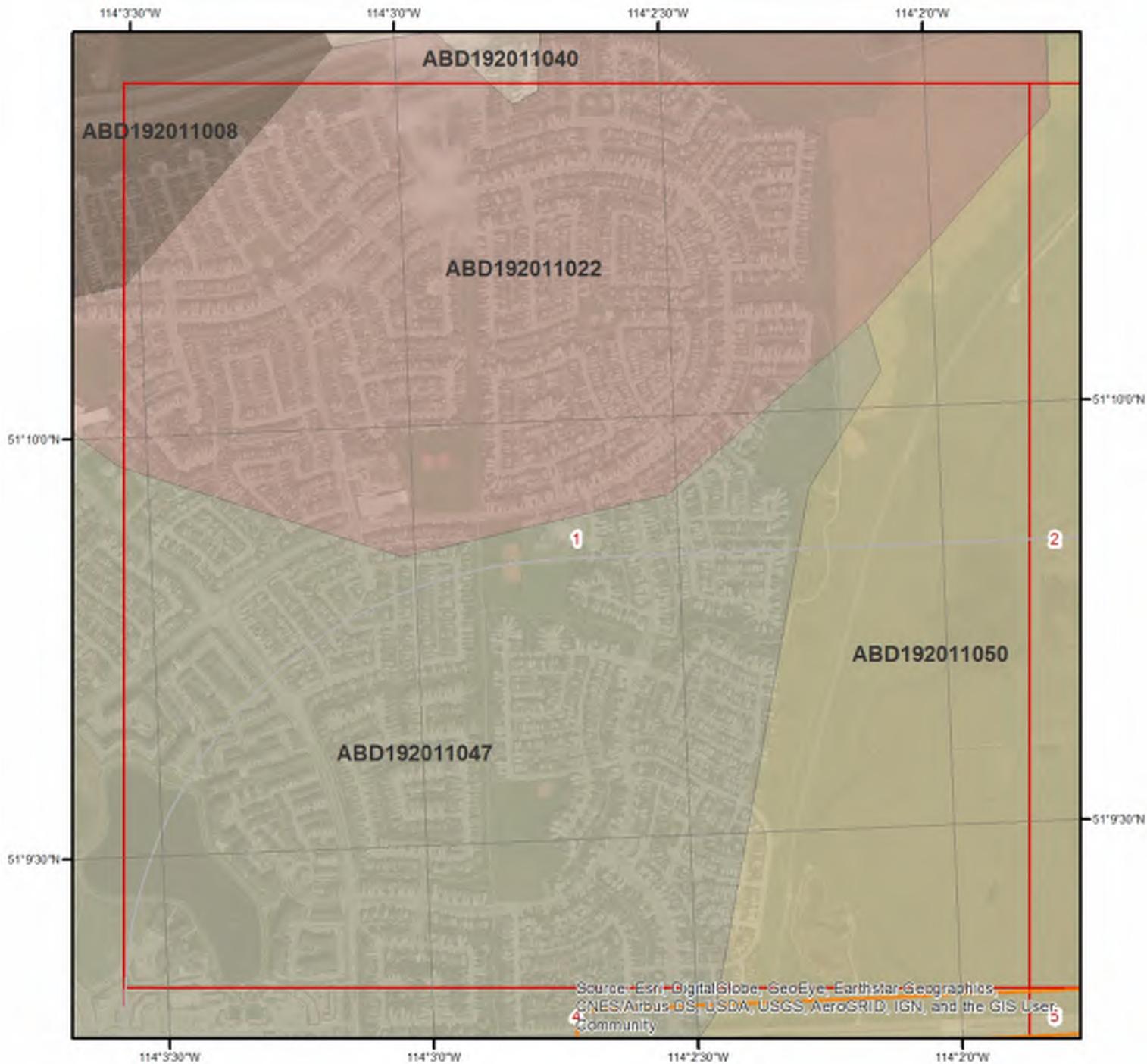
Soil Map



This map shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



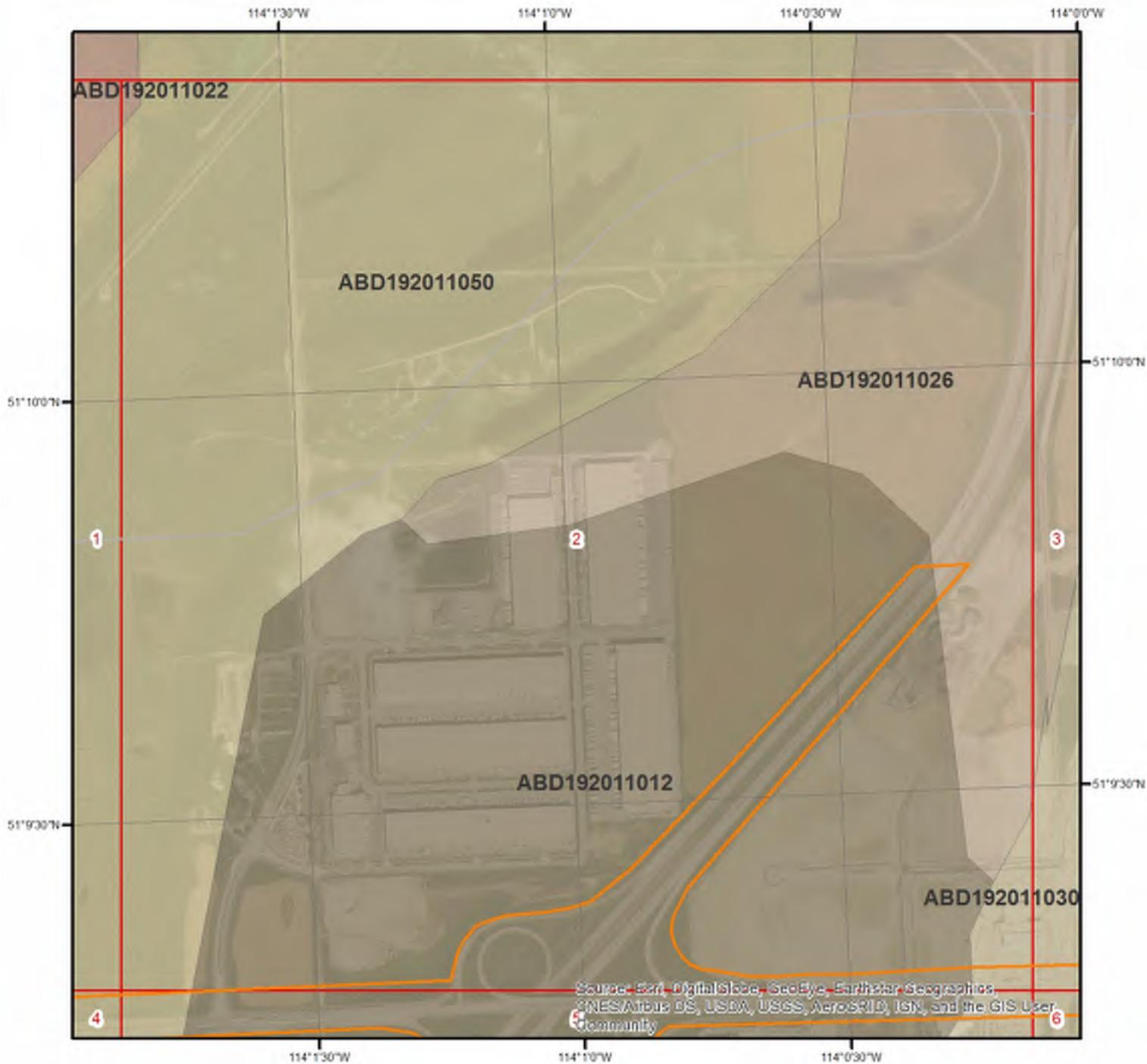
Soil Map - Page 1



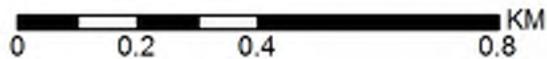
This maps shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



Soil Map - Page 2



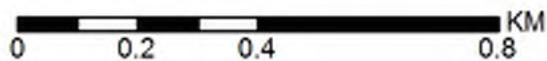
This maps shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



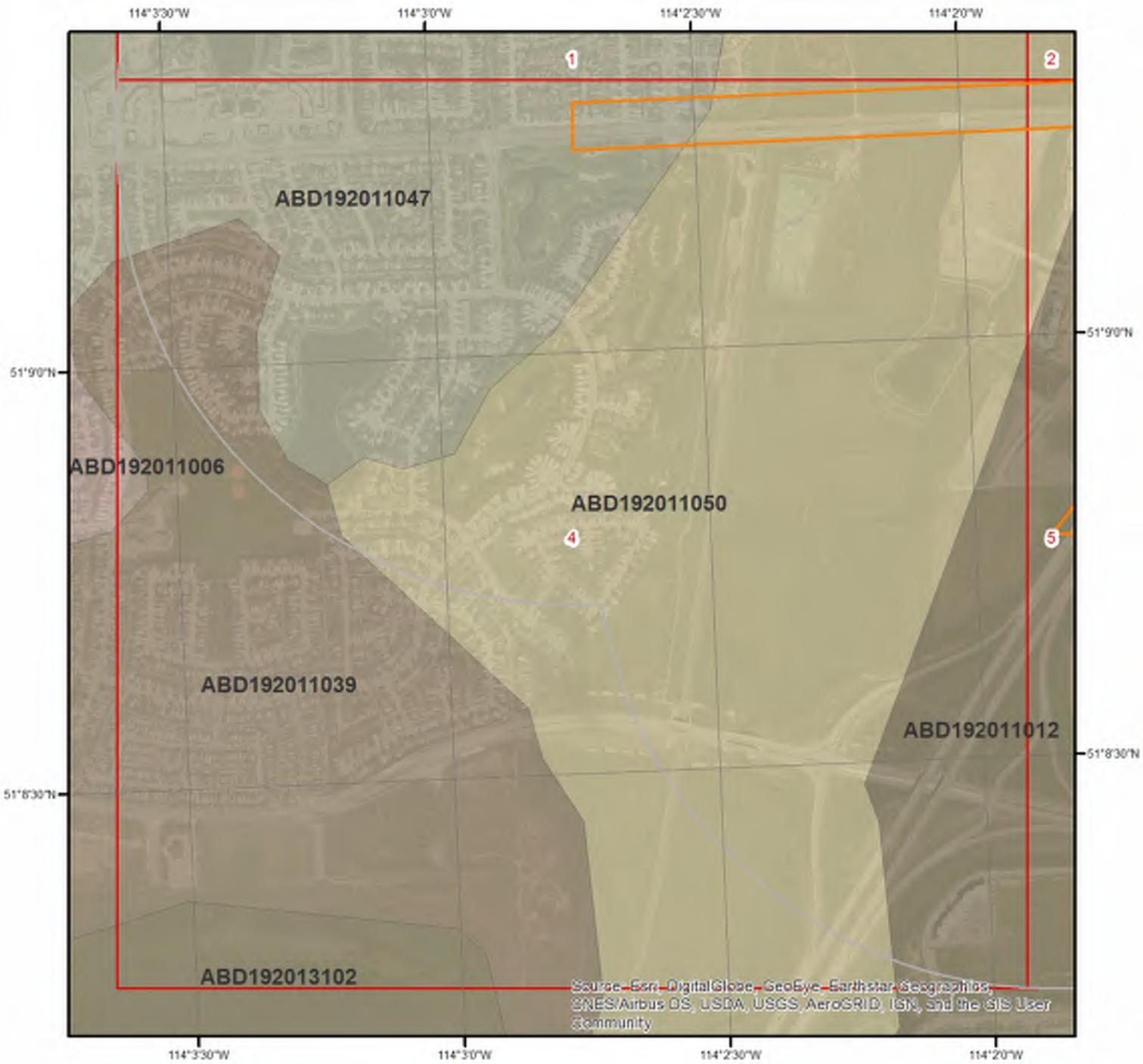
Soil Map - Page 3



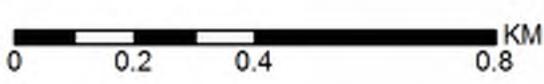
This maps shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



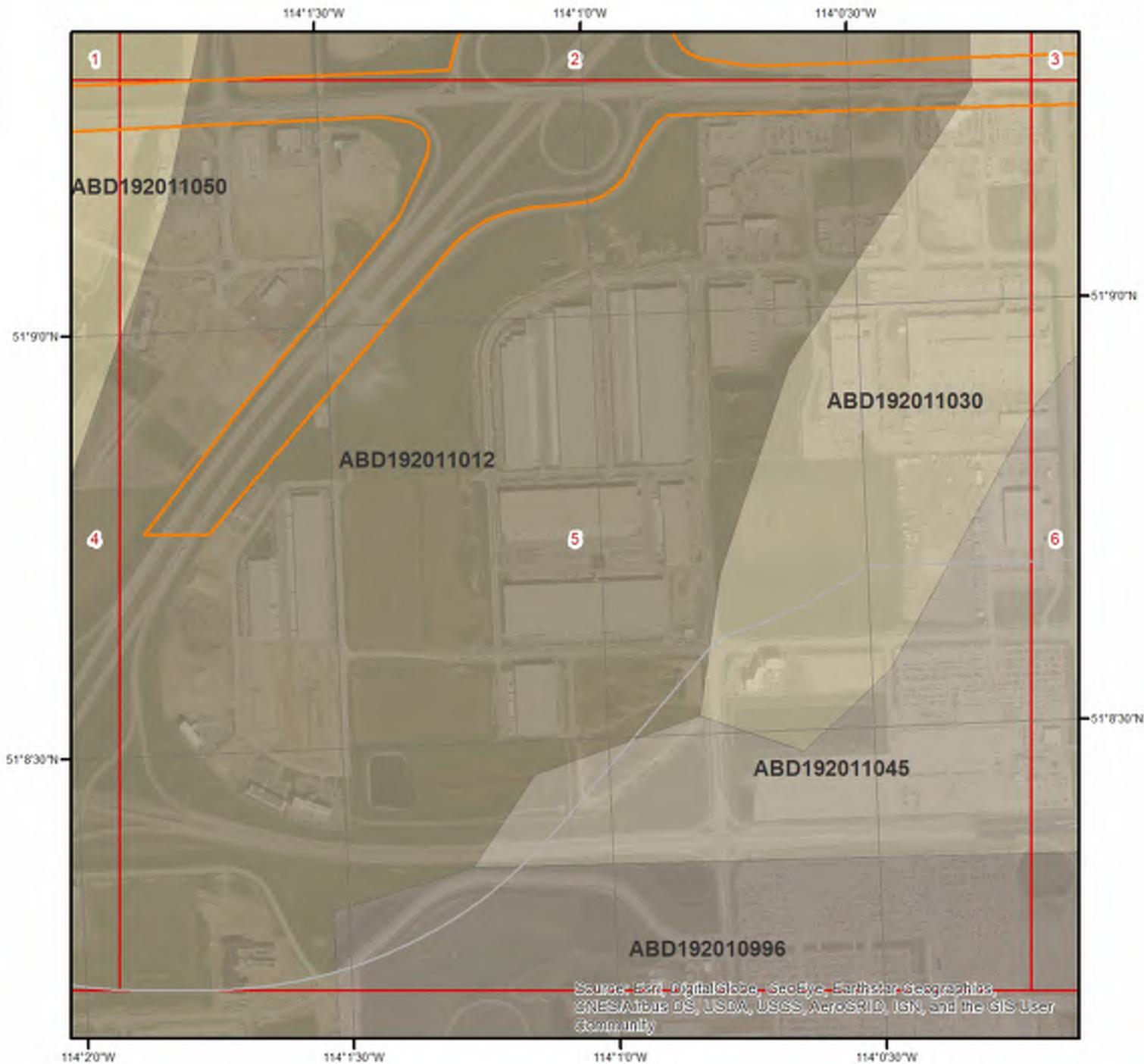
Soil Map - Page 4



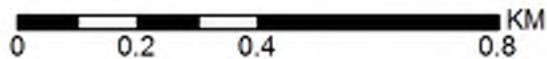
This maps shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



Soil Map - Page 5



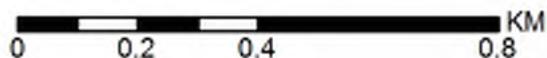
This maps shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



Soil Map - Page 6



This maps shows soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information

Detailed soil information about each unit within the search radius is provided below.

Alberta Detailed Soil Survey (DSS3)

Polygon ID: ABD192010996

Component

Component ID:	ABD19201099601	Slope Steepness(%):	0
Soil Name ID:	ABZDL~~~~~N	Slope Length(m):	0
Component No:	1		
Occupied by Component(%):	100		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	MISC.DISTURBED.LAND
Kind of Surface Material:	Unclassified
Soil Drainage Class:	
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Undifferentiated; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Undifferentiated mineral; Not Applicable; Not Applicable
Parent Material Chemical Property:	Undifferentiated; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	-9
Horizon:	C	Total Sand(%):	-9
Depth(cm):	0-100	Total Silt(%):	-9
pH in Calc Chloride:	Not applicable	Total Clay(%):	-9
Saturated Hydraulic Conductivity(cm/h):	Not applicable	Organic Carbon(%):	Not applicable
Electrical conductivity(dS/m):	Not applicable		

Polygon ID: ABD192011012

Component

Soil Information

Component ID:	ABD19201101201	Slope Steepness(%):	3
Soil Name ID:	ABADY~~~~~A	Slope Length(m):	175
Component No:	1		
Occupied by Component(%):	50		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ACADEMY
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	9
Horizon:	Ap	Total Sand(%):	19
Depth(cm):	0-18	Total Silt(%):	50
pH in Calc Chloride:	7.3	Total Clay(%):	31
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.8
Electrical conductivity(dS/m):	0		
Layer No:	2	Very Fine Sand(%):	8
Horizon:	Bm	Total Sand(%):	17
Depth(cm):	18-43	Total Silt(%):	53
pH in Calc Chloride:	6.9	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	2.4
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	7
Horizon:	Ck	Total Sand(%):	15
Depth(cm):	43-90	Total Silt(%):	50
pH in Calc Chloride:	7.5	Total Clay(%):	35

Soil Information

Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		
Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	90-100	Total Silt(%):	54
pH in Calc Chloride:	8.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201101202	Slope Steepness(%):	3
Soil Name ID:	ABRKV~~~~~A	Slope Length(m):	165
Component No:	2		
Occupied by Component(%):	50		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ROCKYVIEW
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Medium; Moderately Fine; Not Applicable
Mode of Deposition 1, 2, 3:	Glaciolacustrine; Till (Morainal); Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Undifferentiated; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	6
Horizon:	Ap	Total Sand(%):	15
Depth(cm):	0-18	Total Silt(%):	65
pH in Calc Chloride:	7.4	Total Clay(%):	20
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4
Electrical conductivity(dS/m):	0		

Soil Information

Layer No:	2	Very Fine Sand(%):	7
Horizon:	Bm	Total Sand(%):	15
Depth(cm):	18-40	Total Silt(%):	60
pH in Calc Chloride:	7.4	Total Clay(%):	25
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1.5
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	4
Horizon:	Ck	Total Sand(%):	10
Depth(cm):	40-60	Total Silt(%):	70
pH in Calc Chloride:	7.9	Total Clay(%):	20
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	60-100	Total Silt(%):	54
pH in Calc Chloride:	7.8	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Polygon ID: ABD192011026

Component

Component ID:	ABD19201102601	Slope Steepness(%):	2
Soil Name ID:	ABADY~~~~~A	Slope Length(m):	175
Component No:	1		
Occupied by Component(%):	40		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ACADEMY
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable

Soil Information

Parent Material Chemical Property: Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth: No root restricting layer
Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	9
Horizon:	Ap	Total Sand(%):	19
Depth(cm):	0-18	Total Silt(%):	50
pH in Calc Chloride:	7.3	Total Clay(%):	31
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.8
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	8
Horizon:	Bm	Total Sand(%):	17
Depth(cm):	18-43	Total Silt(%):	53
pH in Calc Chloride:	6.9	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	2.4
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	7
Horizon:	Ck	Total Sand(%):	15
Depth(cm):	43-90	Total Silt(%):	50
pH in Calc Chloride:	7.5	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	90-100	Total Silt(%):	54
pH in Calc Chloride:	8.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201102602	Slope Steepness(%):	3
Soil Name ID:	ABRKV~~~~~A	Slope Length(m):	165
Component No:	2		

Soil Information

Occupied by 40
 Component(%):
 Surface Stoniness Slightly stony
 Class:

Soil Name

Soil Name: ROCKYVIEW
 Kind of Surface Material: Mineral
 Soil Drainage Class: Well drained
 Water Table Never
 Characteristics:
 Parent Material 1, 2, 3: Medium; Moderately Fine; Not Applicable
 Mode of Deposition 1, 2, 3: Glaciolacustrine; Till (Morainal); Not Applicable
 Parent Material Chemical Property: Moderately / Very Strongly Calcareous; Undifferentiated; Not Applicable
 Layer Restricting Root Growth: No root restricting layer
 Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	6
Horizon:	Ap	Total Sand(%):	15
Depth(cm):	0-18	Total Silt(%):	65
pH in Calc Chloride:	7.4	Total Clay(%):	20
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4
Electrical conductivity(dS/m):	0		
Layer No:	2	Very Fine Sand(%):	7
Horizon:	Bm	Total Sand(%):	15
Depth(cm):	18-40	Total Silt(%):	60
pH in Calc Chloride:	7.4	Total Clay(%):	25
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1.5
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	4
Horizon:	Ck	Total Sand(%):	10
Depth(cm):	40-60	Total Silt(%):	70
pH in Calc Chloride:	7.9	Total Clay(%):	20
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		
Layer No:	4	Very Fine Sand(%):	5

Soil Information

Horizon:	Ck	Total Sand(%):	11
Depth(cm):	60-100	Total Silt(%):	54
pH in Calc Chloride:	7.8	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201102603	Slope Steepness(%):	0.5
Soil Name ID:	ABBZC~~~~~N	Slope Length(m):	25
Component No:	3		
Occupied by Component(%):	20		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	BALZAC
Kind of Surface Material:	Mineral
Soil Drainage Class:	Very poorly drained
Water Table Characteristics:	Always
Parent Material 1, 2, 3:	Fine; Moderately Fine; Not Applicable
Mode of Deposition 1, 2, 3:	Lacustrine; Till (Morainal); Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Undifferentiated; Not Applicable
Layer Restricting Root Growth:	Second layer
Type of Root-Restricting Layer:	Salinity

Soil Layer

Layer No:	1	Very Fine Sand(%):	8
Horizon:	Ah	Total Sand(%):	22
Depth(cm):	0-10	Total Silt(%):	43
pH in Calc Chloride:	7.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	5.4
Electrical conductivity(dS/m):	1		
Layer No:	2	Very Fine Sand(%):	9
Horizon:	Ahksgj	Total Sand(%):	20
Depth(cm):	10-25	Total Silt(%):	40

Soil Information

pH in Calc Chloride:	7.7	Total Clay(%):	40
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.2
Electrical conductivity(dS/m):	8		
Layer No:	3	Very Fine Sand(%):	8
Horizon:	ACskgj	Total Sand(%):	26
Depth(cm):	25-40	Total Silt(%):	32
pH in Calc Chloride:	8.5	Total Clay(%):	42
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	1.3
Electrical conductivity(dS/m):	16		
Layer No:	4	Very Fine Sand(%):	7
Horizon:	Cskg	Total Sand(%):	15
Depth(cm):	40-80	Total Silt(%):	35
pH in Calc Chloride:	8.7	Total Clay(%):	50
Saturated Hydraulic Conductivity(cm/h):	0	Organic Carbon(%):	0
Electrical conductivity(dS/m):	15		
Layer No:	5	Very Fine Sand(%):	10
Horizon:	Cskg	Total Sand(%):	35
Depth(cm):	80-100	Total Silt(%):	35
pH in Calc Chloride:	8.7	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	15		

Polygon ID: ABD192011030

Component

Component ID:	ABD19201103001	Slope Steepness(%):	4
Soil Name ID:	ABADY~~~~~A	Slope Length(m):	105
Component No:	1		
Occupied by Component(%):	40		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ACADEMY
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained

Soil Information

Water Table	Never
Charateristics:	
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	9
Horizon:	Ap	Total Sand(%):	19
Depth(cm):	0-18	Total Silt(%):	50
pH in Calc Chloride:	7.3	Total Clay(%):	31
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.8
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	8
Horizon:	Bm	Total Sand(%):	17
Depth(cm):	18-43	Total Silt(%):	53
pH in Calc Chloride:	6.9	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	2.4
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	7
Horizon:	Ck	Total Sand(%):	15
Depth(cm):	43-90	Total Silt(%):	50
pH in Calc Chloride:	7.5	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	90-100	Total Silt(%):	54
pH in Calc Chloride:	8.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Soil Information

Component ID:	ABD19201103002	Slope Steepness(%):	3
Soil Name ID:	ABRKV~~~~~A	Slope Length(m):	90
Component No:	2		
Occupied by Component(%):	40		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ROCKYVIEW
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table	Never
Charateristics:	
Parent Material 1, 2, 3:	Medium; Moderately Fine; Not Applicable
Mode of Deposition 1, 2, 3:	Glaciolacustrine; Till (Morainal); Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Undifferentiated; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	6
Horizon:	Ap	Total Sand(%):	15
Depth(cm):	0-18	Total Silt(%):	65
pH in Calc Chloride:	7.4	Total Clay(%):	20
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	7
Horizon:	Bm	Total Sand(%):	15
Depth(cm):	18-40	Total Silt(%):	60
pH in Calc Chloride:	7.4	Total Clay(%):	25
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1.5
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	4
Horizon:	Ck	Total Sand(%):	10
Depth(cm):	40-60	Total Silt(%):	70
pH in Calc Chloride:	7.9	Total Clay(%):	20
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	0

Soil Information

Electrical conductivity(dS/m): 0

Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	60-100	Total Silt(%):	54
pH in Calc Chloride:	7.8	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201103003	Slope Steepness(%):	3
Soil Name ID:	ABZERzbl--A	Slope Length(m):	45
Component No:	3		
Occupied by Component(%):	20		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name: MISC.ERODED
Kind of Surface Material: Mineral
Soil Drainage Class: Well drained
Water Table: Never
Charateristics:
Parent Material 1, 2, 3: Undifferentiated; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3: Undifferentiated mineral; Not Applicable; Not Applicable
Parent Material Chemical Property: Undifferentiated; Not Applicable; Not Applicable
Layer Restricting Root Growth: No root restricting layer
Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	11
Horizon:	Apk	Total Sand(%):	40
Depth(cm):	0-15	Total Silt(%):	30
pH in Calc Chloride:	6.5	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	3
Electrical conductivity(dS/m):	0		

Soil Information

Layer No:	2	Very Fine Sand(%):	11
Horizon:	Ck	Total Sand(%):	40
Depth(cm):	15-100	Total Silt(%):	30
pH in Calc Chloride:	7	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0.5
Electrical conductivity(dS/m):	0		

Polygon ID: ABD192011039

Component

Component ID:	ABD19201103901	Slope Steepness(%):	1
Soil Name ID:	ABADY~~~~~A	Slope Length(m):	160
Component No:	1		
Occupied by Component(%):	80		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ACADEMY
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	9
Horizon:	Ap	Total Sand(%):	19
Depth(cm):	0-18	Total Silt(%):	50
pH in Calc Chloride:	7.3	Total Clay(%):	31
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.8
Electrical conductivity(dS/m):	0		

Soil Information

Layer No:	2	Very Fine Sand(%):	8
Horizon:	Bm	Total Sand(%):	17
Depth(cm):	18-43	Total Silt(%):	53
pH in Calc Chloride:	6.9	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	2.4
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	7
Horizon:	Ck	Total Sand(%):	15
Depth(cm):	43-90	Total Silt(%):	50
pH in Calc Chloride:	7.5	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		
Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	90-100	Total Silt(%):	54
pH in Calc Chloride:	8.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201103902	Slope Steepness(%):	1
Soil Name ID:	ABZCOzbl~~N	Slope Length(m):	50
Component No:	2		
Occupied by Component(%):	20		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	MISC.COARSE
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Undifferentiated; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Undifferentiated mineral; Not Applicable; Not Applicable
Parent Material Chemical Property:	Undifferentiated; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer

Soil Information

Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	15
Horizon:	Ah	Total Sand(%):	60
Depth(cm):	0-15	Total Silt(%):	30
pH in Calc Chloride:	6	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	30	Organic Carbon(%):	4.2
Electrical conductivity(dS/m):	0		
Layer No:	2	Very Fine Sand(%):	15
Horizon:	Bm	Total Sand(%):	60
Depth(cm):	15-50	Total Silt(%):	30
pH in Calc Chloride:	6.5	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	30	Organic Carbon(%):	1
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	15
Horizon:	Ck	Total Sand(%):	60
Depth(cm):	50-100	Total Silt(%):	30
pH in Calc Chloride:	7	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	0.5
Electrical conductivity(dS/m):	0		

Polygon ID: ABD192011045

Component

Component ID:	ABD19201104501	Slope Steepness(%):	0.5
Soil Name ID:	ABBZC~~~~~N	Slope Length(m):	25
Component No:	1		
Occupied by Component(%):	60		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name: BALZAC
Kind of Surface Material: Mineral

Soil Information

Soil Drainage Class:	Very poorly drained
Water Table Characteristics:	Always
Parent Material 1, 2, 3:	Fine; Moderately Fine; Not Applicable
Mode of Deposition 1, 2, 3:	Lacustrine; Till (Morainal); Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Undifferentiated; Not Applicable
Layer Restricting Root Growth:	Second layer
Type of Root-Restricting Layer:	Salinity

Soil Layer

Layer No:	1	Very Fine Sand(%):	8
Horizon:	Ah	Total Sand(%):	22
Depth(cm):	0-10	Total Silt(%):	43
pH in Calc Chloride:	7.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	5.4
Electrical conductivity(dS/m):	1		

Layer No:	2	Very Fine Sand(%):	9
Horizon:	Ahksgj	Total Sand(%):	20
Depth(cm):	10-25	Total Silt(%):	40
pH in Calc Chloride:	7.7	Total Clay(%):	40
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.2
Electrical conductivity(dS/m):	8		

Layer No:	3	Very Fine Sand(%):	8
Horizon:	ACskgj	Total Sand(%):	26
Depth(cm):	25-40	Total Silt(%):	32
pH in Calc Chloride:	8.5	Total Clay(%):	42
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	1.3
Electrical conductivity(dS/m):	16		

Layer No:	4	Very Fine Sand(%):	7
Horizon:	Cskg	Total Sand(%):	15
Depth(cm):	40-80	Total Silt(%):	35
pH in Calc Chloride:	8.7	Total Clay(%):	50
Saturated Hydraulic Conductivity(cm/h):	0	Organic Carbon(%):	0
Electrical conductivity(dS/m):	15		

Layer No:	5	Very Fine Sand(%):	10
Horizon:	Cskg	Total Sand(%):	35

Soil Information

Depth(cm):	80-100	Total Silt(%):	35
pH in Calc Chloride:	8.7	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	15		

Component

Component ID:	ABD19201104502	Slope Steepness(%):	2
Soil Name ID:	ABLTA~~~~~A	Slope Length(m):	60
Component No:	2		
Occupied by Component(%):	20		
Surface Stoniness Class:	Nonstony		

Soil Name

Soil Name:	LYALTA
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Glaciolacustrine; Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	10
Horizon:	Ap	Total Sand(%):	31
Depth(cm):	0-16	Total Silt(%):	47
pH in Calc Chloride:	6.2	Total Clay(%):	22
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4
Electrical conductivity(dS/m):	0		
Layer No:	2	Very Fine Sand(%):	15
Horizon:	Bm	Total Sand(%):	22
Depth(cm):	16-42	Total Silt(%):	50
pH in Calc Chloride:	6.4	Total Clay(%):	28

Soil Information

Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1.4
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	15
Horizon:	Bm	Total Sand(%):	30
Depth(cm):	42-70	Total Silt(%):	35
pH in Calc Chloride:	6.8	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1
Electrical conductivity(dS/m):	0		
Layer No:	4	Very Fine Sand(%):	15
Horizon:	Ck	Total Sand(%):	45
Depth(cm):	70-100	Total Silt(%):	22
pH in Calc Chloride:	7.9	Total Clay(%):	33
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201104503	Slope Steepness(%):	3
Soil Name ID:	ABBED~~~~~N	Slope Length(m):	175
Component No:	3		
Occupied by Component(%):	20		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	BEDDINGTON
Kind of Surface Material:	Mineral
Soil Drainage Class:	Moderately well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	Third layer
Type of Root-Restricting Layer:	Solonetzic

Soil Layer

Soil Information

Layer No:	1	Very Fine Sand(%):	10
Horizon:	Ah	Total Sand(%):	28
Depth(cm):	0-9	Total Silt(%):	47
pH in Calc Chloride:	6.7	Total Clay(%):	25
Saturated Hydraulic Conductivity(cm/h):	30	Organic Carbon(%):	4.6
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	13
Horizon:	Ae	Total Sand(%):	47
Depth(cm):	9-15	Total Silt(%):	40
pH in Calc Chloride:	6.2	Total Clay(%):	13
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	3.3
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	11
Horizon:	Bnt	Total Sand(%):	41
Depth(cm):	15-30	Total Silt(%):	31
pH in Calc Chloride:	8.6	Total Clay(%):	28
Saturated Hydraulic Conductivity(cm/h):	0	Organic Carbon(%):	1.8
Electrical conductivity(dS/m):	0		

Layer No:	4	Very Fine Sand(%):	9
Horizon:	Ccasa	Total Sand(%):	20
Depth(cm):	30-60	Total Silt(%):	53
pH in Calc Chloride:	9.4	Total Clay(%):	27
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	0
Electrical conductivity(dS/m):	14		

Layer No:	5	Very Fine Sand(%):	9
Horizon:	Csk	Total Sand(%):	20
Depth(cm):	60-100	Total Silt(%):	50
pH in Calc Chloride:	8.5	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	9		

Polygon ID: ABD192011047

Component

Component ID:	ABD19201104701	Slope Steepness(%):	3
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Soil Information

Soil Name ID: ABHPV~~~~~A **Slope Length(m):** 225
Component No: 1
Occupied by Component(%): 60
Surface Stoniness Class: Slightly stony

Soil Name

Soil Name: HAPPY VALLEY
Kind of Surface Material: Mineral
Soil Drainage Class: Well drained
Water Table: Never
Charateristics:
Parent Material 1, 2, 3: Moderately Coarse; Moderately Fine; Not Applicable
Mode of Deposition 1, 2, 3: Glaciofluvial; Till (Morainal); Not Applicable
Parent Material Chemical Property: Moderately / Very Strongly Calcareous; Undifferentiated; Not Applicable
Layer Restricting Root Growth: No root restricting layer
Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	20
Horizon:	Apk	Total Sand(%):	72
Depth(cm):	0-18	Total Silt(%):	18
pH in Calc Chloride:	7.4	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	2.4
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	20
Horizon:	Ck	Total Sand(%):	75
Depth(cm):	18-90	Total Silt(%):	19
pH in Calc Chloride:	7.6	Total Clay(%):	6
Saturated Hydraulic Conductivity(cm/h):	30	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	90-100	Total Silt(%):	54
pH in Calc Chloride:	8.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Soil Information

Component

Component ID:	ABD19201104702	Slope Steepness(%):	3
Soil Name ID:	ABADY~~~~~A	Slope Length(m):	115
Component No:	2		
Occupied by Component(%):	20		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	ACADEMY
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	9
Horizon:	Ap	Total Sand(%):	19
Depth(cm):	0-18	Total Silt(%):	50
pH in Calc Chloride:	7.3	Total Clay(%):	31
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4.8
Electrical conductivity(dS/m):	0		
Layer No:	2	Very Fine Sand(%):	8
Horizon:	Bm	Total Sand(%):	17
Depth(cm):	18-43	Total Silt(%):	53
pH in Calc Chloride:	6.9	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	2.4
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	7

Soil Information

Horizon:	Ck	Total Sand(%):	15
Depth(cm):	43-90	Total Silt(%):	50
pH in Calc Chloride:	7.5	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		
Layer No:	4	Very Fine Sand(%):	5
Horizon:	Ck	Total Sand(%):	11
Depth(cm):	90-100	Total Silt(%):	54
pH in Calc Chloride:	8.1	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201104703	Slope Steepness(%):	2
Soil Name ID:	ABLTA~~~~~A	Slope Length(m):	50
Component No:	3		
Occupied by Component(%):	20		
Surface Stoniness Class:	Nonstony		

Soil Name

Soil Name:	LYALTA
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained
Water Table Characteristics:	Never
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Glaciolacustrine; Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	No root restricting layer
Type of Root-Restricting Layer:	n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	10
Horizon:	Ap	Total Sand(%):	31
Depth(cm):	0-16	Total Silt(%):	47

Soil Information

pH in Calc Chloride:	6.2	Total Clay(%):	22
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	4
Electrical conductivity(dS/m):	0		
Layer No:	2	Very Fine Sand(%):	15
Horizon:	Bm	Total Sand(%):	22
Depth(cm):	16-42	Total Silt(%):	50
pH in Calc Chloride:	6.4	Total Clay(%):	28
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1.4
Electrical conductivity(dS/m):	0		
Layer No:	3	Very Fine Sand(%):	15
Horizon:	Bm	Total Sand(%):	30
Depth(cm):	42-70	Total Silt(%):	35
pH in Calc Chloride:	6.8	Total Clay(%):	35
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	1
Electrical conductivity(dS/m):	0		
Layer No:	4	Very Fine Sand(%):	15
Horizon:	Ck	Total Sand(%):	45
Depth(cm):	70-100	Total Silt(%):	22
pH in Calc Chloride:	7.9	Total Clay(%):	33
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Polygon ID: ABD192011050

Component

Component ID:	ABD19201105001	Slope Steepness(%):	2
Soil Name ID:	ABNSKaa~~~A	Slope Length(m):	400
Component No:	1		
Occupied by Component(%):	60		
Surface Stoniness Class:	Slightly stony		

Soil Name

Soil Name:	NOSE CREEK
Kind of Surface Material:	Mineral
Soil Drainage Class:	Well drained

Soil Information

Water Table	Never
Charateristics:	
Parent Material 1, 2, 3:	Moderately Fine; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3:	Till (Morainal); Not Applicable; Not Applicable
Parent Material Chemical Property:	Moderately / Very Strongly Calcareous; Not Applicable; Not Applicable
Layer Restricting Root Growth:	Third layer
Type of Root-Restricting Layer:	Salinity

Soil Layer

Layer No:	1	Very Fine Sand(%):	9
Horizon:	Apk	Total Sand(%):	20
Depth(cm):	0-18	Total Silt(%):	55
pH in Calc Chloride:	7.8	Total Clay(%):	25
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	3
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	8
Horizon:	Ck	Total Sand(%):	18
Depth(cm):	18-60	Total Silt(%):	58
pH in Calc Chloride:	8	Total Clay(%):	24
Saturated Hydraulic Conductivity(cm/h):	3	Organic Carbon(%):	0
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	9
Horizon:	Csk	Total Sand(%):	20
Depth(cm):	60-100	Total Silt(%):	46
pH in Calc Chloride:	8.3	Total Clay(%):	34
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	0
Electrical conductivity(dS/m):	10		

Component

Component ID:	ABD19201105002	Slope Steepness(%):	25
Soil Name ID:	ABZCOzbl~N	Slope Length(m):	225
Component No:	2		
Occupied by Component(%):	20		
Surface Stoniness Class:	Slightly stony		

Soil Information

Soil Name

Soil Name: MISC.COARSE
Kind of Surface Material: Mineral
Soil Drainage Class: Well drained
Water Table Never
Charateristics:
Parent Material 1, 2, 3: Undifferentiated; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3: Undifferentiated mineral; Not Applicable; Not Applicable
Parent Material Chemical Property: Undifferentiated; Not Applicable; Not Applicable
Layer Restricting Root Growth: No root restricting layer
Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	15
Horizon:	Ah	Total Sand(%):	60
Depth(cm):	0-15	Total Silt(%):	30
pH in Calc Chloride:	6	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	30	Organic Carbon(%):	4.2
Electrical conductivity(dS/m):	0		

Layer No:	2	Very Fine Sand(%):	15
Horizon:	Bm	Total Sand(%):	60
Depth(cm):	15-50	Total Silt(%):	30
pH in Calc Chloride:	6.5	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	30	Organic Carbon(%):	1
Electrical conductivity(dS/m):	0		

Layer No:	3	Very Fine Sand(%):	15
Horizon:	Ck	Total Sand(%):	60
Depth(cm):	50-100	Total Silt(%):	30
pH in Calc Chloride:	7	Total Clay(%):	10
Saturated Hydraulic Conductivity(cm/h):	10	Organic Carbon(%):	0.5
Electrical conductivity(dS/m):	0		

Component

Component ID:	ABD19201105003	Slope Steepness(%):	0
Soil Name ID:	ABZUN~~~~~N	Slope Length(m):	225

Soil Information

Component No: 3
Occupied by Component(%): 20
Surface Stoniness Class: Slightly stony

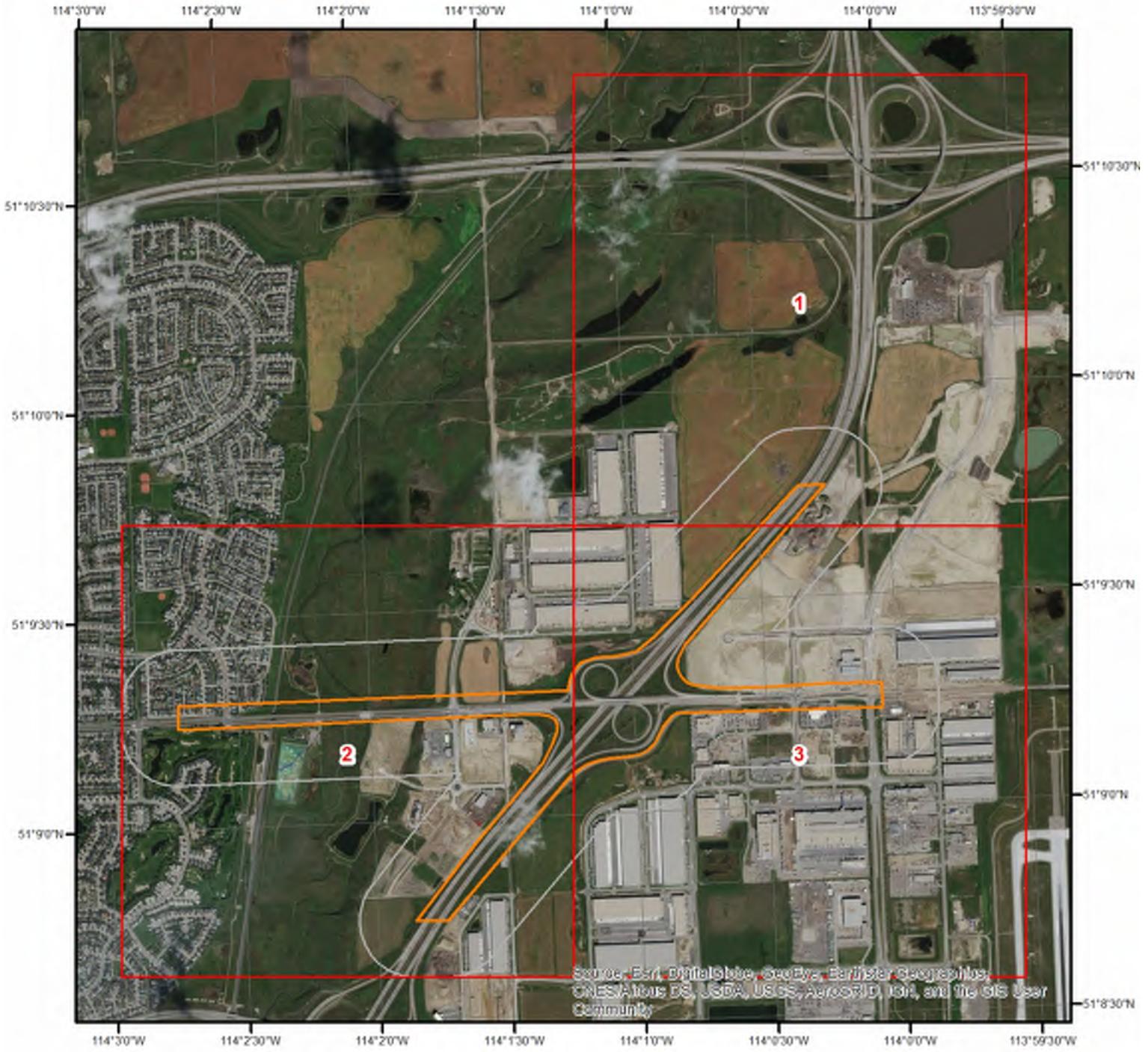
Soil Name

Soil Name: MISC.UNDIFF.MINERAL
Kind of Surface Material: Mineral
Soil Drainage Class: Well drained
Water Table: Never
Charateristics:
Parent Material 1, 2, 3: Undifferentiated; Not Applicable; Not Applicable
Mode of Deposition 1, 2, 3: Undifferentiated mineral; Not Applicable; Not Applicable
Parent Material Chemical Property: Undifferentiated; Not Applicable; Not Applicable
Layer Restricting Root Growth: No root restricting layer
Type of Root-Restricting Layer: n/a

Soil Layer

Layer No:	1	Very Fine Sand(%):	11
Horizon:	C	Total Sand(%):	40
Depth(cm):	0-100	Total Silt(%):	30
pH in Calc Chloride:	6.5	Total Clay(%):	30
Saturated Hydraulic Conductivity(cm/h):	1	Organic Carbon(%):	1
Electrical conductivity(dS/m):	0		

Wells and Additional Sources



Wells & Additional Sources



- | | | |
|------------------|-----------------------------|------------------------------|
| Project Property | Buffer | Sites with Unknown Elevation |
| Buffer | Buffer | |
| Buffer | Buffer | |
| Buffer | Buffer | |
| Buffer | Sites with Higher Elevation | |
| Buffer | Sites with Same Elevation | |
| Buffer | Sites with Lower Elevation | |



Wells and Additional Sources



Wells & Additional Sources - Page 1

- ▲ Sites with Higher Elevation
- Sites with Same Elevation
- ▼ Sites with Lower Elevation
- Sites with Unknown Elevation



Wells and Additional Sources

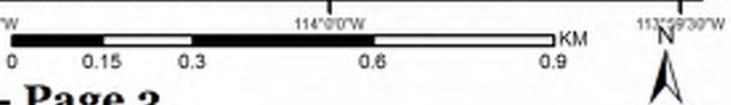


Wells & Additional Sources - Page 2

- ▲ Sites with Higher Elevation
- ▣ Sites with Same Elevation
- ▼ Sites with Lower Elevation
- Sites with Unknown Elevation



Wells and Additional Sources



Wells & Additional Sources - Page 3

- ▲ Sites with Higher Elevation
- Sites with Same Elevation
- ▼ Sites with Lower Elevation
- Sites with Unknown Elevation



Wells and Additional Sources Summary

Federal Sources

National Energy Board Wells

Map Key	ID	Distance (m)	Direction
No records found			

Provincial Sources

Alberta Oil and Gas Wells

Map Key	Licence NO	Distance (m)	Direction
8	0022219	168.51	S
12	0038439	185.8	WSW
12	0022789	185.8	WSW

Alberta Orphan Wells

Map Key	ID	Distance (m)	Direction
No records found			

Alberta Water Well Information Database

Map Key	Well ID	Distance (m)	Direction
1	498388	0.94	NE
2	12011832	33.87	S
4	408700	122.35	NNE
5	408701	136.27	WNW
6	12011600	137.76	SSW
6	12011830	137.76	SSW
6	12011831	137.76	SSW
9	408698	178.24	SE
10	467800	182.75	ENE
13	12011273	191.45	NE

Groundwater Well Network

Map Key	ID	Distance (m)	Direction
No records found			

Horizontal Wells

Map Key	ID	Distance (m)	Direction
No records found			

Well Licenses

Map Key	Well ID	Distance (m)	Direction
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Wells and Additional Sources Summary

3		115.65	SSW
3	00/08-23-025-01W5/0	115.65	SSW
7	F1/14-23-025-01W5/0	153.22	WSW
7		153.22	WSW
11		183.7	WSW
11	00/14-23-025-01W5/0	183.7	WSW

Private Sources

Oil and Gas Wells

Map Key	ID	Distance (m)	Direction
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No records found

Wells and Additional Sources Detail Report

Alberta Oil and Gas Wells

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
8	S	0.17	168.51	1,082.00	AOGW

Licence NO: 0022219 ATS Coordinates: 8-23-25-1-5
 Licence Date: 19620306 Structure:
 Mode: PUMPING Type:
 Well Status Date: 19660501 Fluid: CRUDE OIL
 Total Depth (m): 1783.10 Licencee: Bonavista Petroleum Ltd.
 Final Drill Date: 19620414
 Well Name: PIONEER CANADA CROSSFIELD 8-23-25-1
 Licencee Address: 1100, 321 - 6 Avenue SW Calgary, AB T2P 3H3

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
12	WSW	0.19	185.80	1,059.97	AOGW

Licence NO: 0038439 ATS Coordinates: 14-23-25-1-5
 Licence Date: 19700717 Structure:
 Mode: ABANDONED Type:
 Well Status Date: 19701105 Fluid:
 Total Depth (m): 0228.60 Licencee: Petro-Canada
 Final Drill Date: 19700728
 Well Name: BAYSEL ET AL CROSS WW 14-23-25-1
 Licencee Address: Box 2844, 150 - 6 Avenue SW Floor 10 Calgary, AB T2P 3E3

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
12	WSW	0.19	185.80	1,059.97	AOGW

Licence NO: 0022789 ATS Coordinates: 14-23-25-1-5
 Licence Date: 19620801 Structure:
 Mode: ABANDONED Type: INJECTION
 Well Status Date: 19730404 Fluid: WATER
 Total Depth (m): 1777.60 Licencee: Northstar Energy Corporation
 Final Drill Date: 19620818
 Well Name: PIONEER CANADA CROSSFIELD 14-23-25-1
 Licencee Address: 1600, 324 - 8 Avenue SW Calgary, AB T2P 2Z5

Alberta Water Well Information Database

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
1	NE	0.00	0.94	1,085.00	WWIS

Well ID: 498388 Elevation Source: Not Obtained

Wells and Additional Sources Detail Report

Driller ID:	24540	Method of Drilling:	
Licence No:		GPS Obtained:	Not Verified
GIC Well ID:	498388	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	Yes
Block:	4	Submitted?:	Yes
Plan:	8810335	Location Locked?:	Yes
Type of Work:		Longitude:	-114.007578
Flowing Well:		Latitude:	51.161647
Date Started:		LSD:	EH
Water Req Per Day:		Section:	25
Gas Present:		Township:	25
Oil Present:		Range:	1
Flow Rate:		Meridian:	5
Drilling Company:		DLS Coordinates:	EH-25-25-1-5
Owner Mailing Address:			
Driller Mailing Address:			
Well Report ID:	498388	Annular Seal Mat:	Driven
Well Owner ID:	10764721	Annular Seal from:	0
Driller ID:	2533726	Annular Seal to:	38
Drill Company ID:	24540	Annular Seal Amt:	
Drill Instance ID:	8338342	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary
Existing Well ID:		Drilling Start Dt:	4/26/2001 0:00:00
Date Received:	6/26/2001 0:00:00	Drilling End Dt:	4/28/2001 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	Not Verified
Well Use:	Domestic	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	192	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	6.62	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	5
Casing Bottom:	38	Recom Intake Depth:	180
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	4.5	Pump Install Depth:	
Liner Thickness:	0.404	Pump Model:	

Wells and Additional Sources Detail Report

Liner Top:	30	Pump Horsepower:	
Liner Bottom:	192	Well Disinfected?:	No
Perforation by:	Saw	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:	0	Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:			
Drilling Report Given to Owner:	No		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:			
Submitted by:			
Additional Comments:	DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 1.5'		

Well Owner ID:	10764721
Owner Name:	ABERHAMSON, AL
PO Box:	
Address:	12221 BARLOW TRAIL, CALGARY
City:	
Postal Code:	
Province:	
Country:	

Driller ID:	2533726
Last Name:	DRILLER
Middle Initial:	NA
First Name:	UNKNOWN
Journeyman No:	1
Is Active?:	Yes

Starting Well ID:	1635000
Ending Well ID:	1639999
Last Well ID Used:	1635040
Company Name:	ROCKYVIEW DRILLING LTD.
Street Address:	BOX 226

Wells and Additional Sources Detail Report

City: BALZAC
Province: AB
Country: CA
Postal Code: T0M 0E0
E-Mail: gwinfo@gov.ab.ca
Is Active?: No

Perforation ID: 4231208
From: 172
To: 192
Diameter: 0.125
Interval: 12

Geophysical Log ID: 6059132
Log Type: Gamma
Log Taken?: No
Sent to AENV?: No

Geophysical Log ID: 5656057
Log Type: Electric
Log Taken?: No
Sent to AENV?: No

Borehole ID: 758130
Diameter: 0
From: 0
To: 192

Depth: 48
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 147
Water Bearing: No
Colour: Dark Gray
Description:
Material: Shale

Wells and Additional Sources Detail Report

Depth: 175
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 56
Water Bearing: No
Colour: Gray
Description: Sandy
Material: Shale

Depth: 135
Water Bearing: No
Colour: Brown
Description:
Material: Shale

Depth: 182
Water Bearing: Yes
Colour:
Description: Water Bearing
Material: Sandstone

Depth: 36
Water Bearing: No
Colour: Brown
Description:
Material: Till

Depth: 75
Water Bearing: No
Colour: Light Gray
Description:
Material: Shale

Depth: 105
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Wells and Additional Sources Detail Report

Depth: 192
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Pump Test ID: 10395245
Test Date: 4/29/2001 0:00:00
Start Time: 1/9/1900 7:12:00
Taken from Top of Casing: No
Static Water Level: 49
End Water Level: 70
Water Removal Type: Pump
Water Removal Rate: 15
Removal Depth from: 180
Reason for Short Test:

Pump Test Item ID: 8288971
Minutes: 0
Pumping Depth: 49
Recovery Depth: 70.33

Pump Test Item ID: 8288979
Minutes: 8
Pumping Depth: 64.33
Recovery Depth: 55.42

Pump Test Item ID: 8288981
Minutes: 10
Pumping Depth: 65.25
Recovery Depth: 54.5

Pump Test Item ID: 8288975
Minutes: 4
Pumping Depth: 62.25
Recovery Depth: 61

Pump Test Item ID: 8288978
Minutes: 7

Wells and Additional Sources Detail Report

Pumping Depth: 64
Recovery Depth: 56

Pump Test Item ID: 8288974
Minutes: 3
Pumping Depth: 61.58
Recovery Depth: 64

Pump Test Item ID: 8288976
Minutes: 5
Pumping Depth: 63
Recovery Depth: 60

Pump Test Item ID: 8288984
Minutes: 16
Pumping Depth: 66.75
Recovery Depth: 54

Pump Test Item ID: 8288988
Minutes: 35
Pumping Depth: 68.08
Recovery Depth: 52.25

Pump Test Item ID: 8288989
Minutes: 40
Pumping Depth: 68.17
Recovery Depth: 52

Pump Test Item ID: 8288992
Minutes: 75
Pumping Depth: 68.67
Recovery Depth: 51.33

Pump Test Item ID: 8288972
Minutes: 1
Pumping Depth: 58
Recovery Depth: 69.42

Pump Test Item ID: 8288980

Wells and Additional Sources Detail Report

Minutes: 9
Pumping Depth: 64.67
Recovery Depth: 55

Pump Test Item ID: 8288982
Minutes: 12
Pumping Depth: 65.67
Recovery Depth: 54.17

Pump Test Item ID: 8288985
Minutes: 20
Pumping Depth: 67.33
Recovery Depth: 53.67

Pump Test Item ID: 8288991
Minutes: 60
Pumping Depth: 68.42
Recovery Depth: 51.58

Pump Test Item ID: 8288987
Minutes: 30
Pumping Depth: 67.75
Recovery Depth: 53

Pump Test Item ID: 8288990
Minutes: 50
Pumping Depth: 68.25
Recovery Depth: 51.67

Pump Test Item ID: 8288995
Minutes: 120
Pumping Depth: 70.33
Recovery Depth: 51

Pump Test Item ID: 8288973
Minutes: 2
Pumping Depth: 65
Recovery Depth: 65.17

Wells and Additional Sources Detail Report

Pump Test Item ID: 8288983
 Minutes: 14
 Pumping Depth: 66.33
 Recovery Depth: 54

Pump Test Item ID: 8288986
 Minutes: 25
 Pumping Depth: 67.5
 Recovery Depth: 53.17

Pump Test Item ID: 8288993
 Minutes: 90
 Pumping Depth: 70
 Recovery Depth: 51.17

Pump Test Item ID: 8288977
 Minutes: 6
 Pumping Depth: 63.5
 Recovery Depth: 58

Pump Test Item ID: 8288994
 Minutes: 105
 Pumping Depth: 70.17
 Recovery Depth: 51

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
2	S	0.03	33.87	1,079.00	WWIS

Well ID:	12011832	Elevation Source:	Not Obtained
Driller ID:	24041	Method of Drilling:	
Licence No:		GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022282	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	No
Block:		Submitted?:	No
Plan:		Location Locked?:	No
Type of Work:		Longitude:	-114.023391
Flowing Well:		Latitude:	51.153783

Wells and Additional Sources Detail Report

Date Started:	LSD:	13
Water Req Per Day:	Section:	24
Gas Present:	Township:	25
Oil Present:	Range:	1
Flow Rate:	Meridian:	5
Drilling Company:	DLS Coordinates:	13-24-25-1-5
Owner Mailing Address:		
Driller Mailing Address:		

Well Report ID:	12012986	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12013192	Annular Seal from:	0
Driller ID:	12000012	Annular Seal to:	44
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	4.5	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	55	Artesian Flow Rate:	
Finish Well Depth:	55	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	2	Pump Install Depth:	
Liner Thickness:	0.188	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	55	Well Disinfected?:	Yes
Perforation by:		Other Log:	
Screen Material:	Plastic	Divert Water Src:	
Screen Size OD:	2	Divert Water Amt:	
Screen Attachment:	Attached To Riser	Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign	11/6/2012 0:00:00		

Wells and Additional Sources Detail Report

Date:
Drilling Report Given to Owner: Yes
Model Output Rating:
Remedial Action:
Flow Control Description:
Pump Type Installed:
Created by: {9643AF3C-582C-4B03-870D-F553D107F23D}
Submitted by: {9643AF3C-582C-4B03-870D-F553D107F23D}
Additional Comments:

Well Owner ID: 12013192
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

Driller ID: 12000012
Last Name: QUINLAN
Middle Initial:
First Name: CHRIS
Journeyman No: 48135A
Is Active?: Yes

Starting Well ID: 1020000
Ending Well ID: 1024999
Last Well ID Used: 1023090
Company Name: AARON DRILLING INC.
Street Address: 242222 2nd Street East
City: Foothills
Province: ALBERTA
Country: CANADA
Postal Code: T1S 3K9
E-Mail: admin@aarondrilling.com
Is Active?: Yes

Borehole ID: 810102
Diameter: 6.125
From: 0
To: 55

Wells and Additional Sources Detail Report

Screen ID: 1120235
 From: 45
 To: 55
 Slot Size: 0.02

Pump Test ID: 16010208
 Test Date:
 Start Time: 1/1/1980 11:00:00
 Taken from Top of Casing: Yes
 Static Water Level: 6.5
 End Water Level:
 Water Removal Type:
 Water Removal Rate:
 Removal Depth from:
 Reason for Short Test:

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
4	NNE	0.12	122.35	1,085.00	WWIS

Well ID:	408700	Elevation Source:	Estimated
Driller ID:	14405	Method of Drilling:	
Licence No:		GPS Obtained:	Map
GIC Well ID:	408700	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):	3575	Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	Yes
Block:		Submitted?:	Yes
Plan:		Location Locked?:	Yes
Type of Work:		Longitude:	-114.021957
Flowing Well:		Latitude:	51.156223
Date Started:		LSD:	4
Water Req Per Day:		Section:	25
Gas Present:		Township:	25
Oil Present:		Range:	1
Flow Rate:		Meridian:	5
Drilling Company:		DLS Coordinates:	4-25-25-1-5
Owner Mailing Address:			
Driller Mailing Address:			

Chem Analysis ID: 2081866

Wells and Additional Sources Detail Report

Well Report ID: 408700
Sample No: 71D143
Sample Date: 6/22/1971 0:00:00
Analysis Date: 7/14/1971 0:00:00
Laboratory: AE
Water Level: 50
Aquifer:
Remarks:

Chemical Analysis ID: 2081866
Element Name: total Kjeldahl nitrogen
Element Symbol: TKN
Decimal Places: 4
Value: 0

Chemical Analysis ID: 2081866
Element Name: Magnesium
Element Symbol: MG
Decimal Places: 4
Value: 3.002304

Chemical Analysis ID: 2081866
Element Name: Electrical Conductivity
Element Symbol: EC
Decimal Places: 0
Value: 1025

Chemical Analysis ID: 2081866
Element Name: Calcium
Element Symbol: CA
Decimal Places: 4
Value: 3.999984

Chemical Analysis ID: 2081866
Element Name: Total Alkalinity
Element Symbol: TA
Decimal Places: 4
Value: 485

Chemical Analysis ID: 2081866
Element Name: Hydroxide

Wells and Additional Sources Detail Report

Element Symbol: OH
Decimal Places: 4
Value: 0

Chemical Analysis ID: 2081866
Element Name: Total Phosphorus
Element Symbol: TP
Decimal Places: 4
Value: 0

Chemical Analysis ID: 2081866
Element Name: Total Hardness
Element Symbol: TH
Decimal Places: 4
Value: 20

Chemical Analysis ID: 2081866
Element Name: Total Dissolved Solids
Element Symbol: TDS
Decimal Places: 0
Value: 920

Chemical Analysis ID: 2081866
Element Name: pH
Element Symbol: PH
Decimal Places: 2
Value: 8.6

Chemical Analysis ID: 2081866
Element Name: Nitrate
Element Symbol: NO3
Decimal Places: 4
Value: 0.0994

Chem Analysis ID: 2084100
Well Report ID: 408700
Sample No: 71D143
Sample Date: 6/22/1971 0:00:00
Analysis Date: 7/14/1971 0:00:00
Laboratory: AE
Water Level: 50

Wells and Additional Sources Detail Report

Aquifer:

Remarks:

Chemical Analysis ID: 2084100
Element Name: Total Alkalinity
Element Symbol: TA
Decimal Places: 4
Value: 485

Chemical Analysis ID: 2084100
Element Name: total Kjeldahl nitrogen
Element Symbol: TKN
Decimal Places: 4
Value: 0

Chemical Analysis ID: 2084100
Element Name: Electrical Conductivity
Element Symbol: EC
Decimal Places: 0
Value: 1025

Chemical Analysis ID: 2084100
Element Name: Total Dissolved Solids
Element Symbol: TDS
Decimal Places: 0
Value: 920

Chemical Analysis ID: 2084100
Element Name: Total Phosphorus
Element Symbol: TP
Decimal Places: 4
Value: 0

Chemical Analysis ID: 2084100
Element Name: Magnesium
Element Symbol: MG
Decimal Places: 4
Value: 3.002304

Chemical Analysis ID: 2084100

Wells and Additional Sources Detail Report

Element Name: Calcium
Element Symbol: CA
Decimal Places: 4
Value: 3.999984

Chemical Analysis ID: 2084100
Element Name: Hydroxide
Element Symbol: OH
Decimal Places: 4
Value: 0

Chemical Analysis ID: 2084100
Element Name: Total Hardness
Element Symbol: TH
Decimal Places: 4
Value: 20

Chemical Analysis ID: 2084100
Element Name: Nitrate
Element Symbol: NO3
Decimal Places: 4
Value: 0.0994

Chemical Analysis ID: 2084100
Element Name: pH
Element Symbol: PH
Decimal Places: 2
Value: 8.6

Chemical Analysis ID: 2084100
Element Name: Chloride
Element Symbol: CL
Decimal Places: 4
Value: 6.01015

Chemical Analysis ID: 2084100
Element Name: Sulphate
Element Symbol: SO4
Decimal Places: 4
Value: 230.33647

Wells and Additional Sources Detail Report

Well Report ID:	408700	Annular Seal Mat:	Driven
Well Owner ID:	10687190	Annular Seal from:	74
Driller ID:	2533726	Annular Seal to:	75
Drill Company ID:	14405	Annular Seal Amt:	
Drill Instance ID:	8337238	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary
Existing Well ID:		Drilling Start Dt:	
Date Received:		Drilling End Dt:	3/1/1971 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	Map
Well Use:	Stock	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	150	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4.56	Flow Ctrl Install?:	No
Casing Thickness:	0	Recommended Rate:	0
Casing Bottom:	150	Recom Intake Depth:	0
Liner Material:		Pump Installed?:	No
Liner OD:	0	Pump Install Depth:	
Liner Thickness:	0	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	0	Well Disinfected?:	No
Perforation by:		Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:	0	Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:			
Drilling Report Given to Owner:	No		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:			
Submitted by:			
Additional Comments:			

Wells and Additional Sources Detail Report

Well Owner ID: 10687190
Owner Name: BLAIR, GORDON
PO Box:
Address: BALZAC
City:
Postal Code:
Province:
Country:

Driller ID: 2533726
Last Name: DRILLER
Middle Initial: NA
First Name: UNKNOWN
Journeyman No: 1
Is Active?: Yes

Starting Well ID:
Ending Well ID:
Last Well ID Used:
Company Name: ANDERSON C G
Street Address:
City:
Province:
Country:
Postal Code:
E-Mail:
Is Active?: No

Geophysical Log ID: 5515827
Log Type: Electric
Log Taken?: No
Sent to AENV?: No

Geophysical Log ID: 5918902
Log Type: Gamma
Log Taken?: No
Sent to AENV?: No

Borehole ID: 618035
Diameter: 0

Wells and Additional Sources Detail Report

From: 0
To: 150

Depth: 18
Water Bearing: No
Colour:
Description:
Material: Clay & Boulders

Depth: 111
Water Bearing: No
Colour:
Description:
Material: Sandstone

Depth: 116
Water Bearing: No
Colour:
Description:
Material: Shale

Depth: 150
Water Bearing: No
Colour:
Description:
Material: Shale

Depth: 128
Water Bearing: No
Colour:
Description:
Material: Shale

Depth: 139
Water Bearing: No
Colour:
Description:
Material: Shale

Depth: 48

Wells and Additional Sources Detail Report

Water Bearing: No
Colour:
Description:
Material: Shale

Depth: 72
Water Bearing: No
Colour:
Description: Soft
Material: Sand & Sandstone

Depth: 88
Water Bearing: No
Colour:
Description:
Material: Shale

Depth: 90
Water Bearing: No
Colour:
Description:
Material: Sandstone

Depth: 140
Water Bearing: No
Colour:
Description:
Material: Sandstone

Depth: 32
Water Bearing: No
Colour:
Description: Sandy
Material: Clay & Sandstone

Depth: 130
Water Bearing: No
Colour:
Description:
Material: Sandstone

Wells and Additional Sources Detail Report

Depth: 119
 Water Bearing: No
 Colour:
 Description:
 Material: Sandstone

Depth: 50
 Water Bearing: No
 Colour:
 Description:
 Material: Sandstone

Depth: 110
 Water Bearing: No
 Colour:
 Description:
 Material: Shale

Pump Test ID: 10349549
 Test Date: 3/1/1971 0:00:00
 Start Time: 1/12/1900 0:00:00
 Taken from Top of Casing: No
 Static Water Level: 14
 End Water Level: 90
 Water Removal Type: Bailer
 Water Removal Rate: 8
 Removal Depth from: 0
 Reason for Short Test:

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
5	WNW	0.14	136.27	1,080.00	WWIS

Well ID:	408701	Elevation Source:	Estimated
Driller ID:	24483	Method of Drilling:	
Licence No:		GPS Obtained:	Not Verified
GIC Well ID:	408701	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):	3525	Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	Yes

Wells and Additional Sources Detail Report

Block:	Submitted?:	Yes
Plan:	Location Locked?:	Yes
Type of Work:	Longitude:	-114.027944
Flowing Well:	Latitude:	51.156177
Date Started:	LSD:	1
Water Req Per Day:	Section:	26
Gas Present:	Township:	25
Oil Present:	Range:	1
Flow Rate:	Meridian:	5
Drilling Company:	DLS Coordinates:	1-26-25-1-5
Owner Mailing Address:		
Driller Mailing Address:		

Well Report ID:	408701	Annular Seal Mat:	Drive Shoe
Well Owner ID:	10687191	Annular Seal from:	0
Driller ID:	2533726	Annular Seal to:	82
Drill Company ID:	24483	Annular Seal Amt:	
Drill Instance ID:	8335462	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Cable Tool
Existing Well ID:		Drilling Start Dt:	8/20/1975 0:00:00
Date Received:	12/10/1975 0:00:00	Drilling End Dt:	9/12/1975 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	Not Verified
Well Use:	Domestic & Stock	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	245	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	7	Flow Ctrl Install?:	No
Casing Thickness:	0.231	Recommended Rate:	
Casing Bottom:	82	Recom Intake Depth:	
Liner Material:	Steel	Pump Installed?:	No
Liner OD:	5.56	Pump Install Depth:	
Liner Thickness:	0	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	245	Well Disinfected?:	No
Perforation by:	Torch	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:	0	Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		

Wells and Additional Sources Detail Report

Saline Water Depth:

Potability Sample Taken?: No

Potable Sample Sent to AENV?: No

Approval Holder Sign

Date:

Drilling Report Given to Owner: No

Model Output Rating:

Remedial Action:

Flow Control Description:

Pump Type Installed:

Created by:

Submitted by:

Additional Comments: WATER AT 180'

Well Owner ID: 10687191

Owner Name: BAR OW RANCH #OFFICE WELL

PO Box:

Address: 1102 EDMONTON TRAIL, CALGARY

City:

Postal Code:

Province:

Country:

Driller ID: 2533726

Last Name: DRILLER

Middle Initial: NA

First Name: UNKNOWN

Journeyman No: 1

Is Active?: Yes

Starting Well ID:

Ending Well ID:

Last Well ID Used:

Company Name: PARSONS DRILLING

Street Address:

City:

Province:

Country:

Postal Code:

E-Mail:

Is Active?: No

Perforation ID: 4189417

Wells and Additional Sources Detail Report

From: 160
To: 242
Diameter: 0.375
Interval: 8

Geophysical Log ID: 5515829
Log Type: Electric
Log Taken?: No
Sent to AENV?: No

Geophysical Log ID: 5918904
Log Type: Gamma
Log Taken?: No
Sent to AENV?: No

Borehole ID: 618037
Diameter: 0
From: 0
To: 245

Depth: 38
Water Bearing: No
Colour: Brown
Description:
Material: Clay & Boulders

Depth: 245
Water Bearing: No
Colour: Gray
Description: Firm
Material: Shale

Depth: 43
Water Bearing: No
Colour:
Description:
Material: Boulders

Depth: 55
Water Bearing: No

Wells and Additional Sources Detail Report

Colour: Brown
 Description:
 Material: Shale

Depth: 83
 Water Bearing: No
 Colour: Brown
 Description: Silty
 Material: Clay

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
6	SSW	0.14	137.76	1,079.68	WWIS

Well ID:	12011600	Elevation Source:	Not Obtained
Driller ID:	24041	Method of Drilling:	
Licence No:		GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022279	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	No
Block:		Submitted?:	No
Plan:		Location Locked?:	No
Type of Work:		Longitude:	-114.02442
Flowing Well:		Latitude:	51.15269
Date Started:		LSD:	13
Water Req Per Day:		Section:	24
Gas Present:		Township:	25
Oil Present:		Range:	1
Flow Rate:		Meridian:	5
Drilling Company:		DLS Coordinates:	13-24-25-1-5
Owner Mailing Address:			
Driller Mailing Address:			

Well Report ID:	12012724	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12012930	Annular Seal from:	
Driller ID:	12000012	Annular Seal to:	
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00

Wells and Additional Sources Detail Report

Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	1	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	17	Artesian Flow Rate:	
Finish Well Depth:	17	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	2	Pump Install Depth:	
Liner Thickness:	0.209	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	17	Well Disinfected?:	Yes
Perforation by:	Machine	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:		Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	11/6/2012 0:00:00		
Drilling Report Given to Owner:	Yes		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:	{9643AF3C-582C-4B03-870D-F553D107F23D}		
Submitted by:	{9643AF3C-582C-4B03-870D-F553D107F23D}		
Additional Comments:			

Well Owner ID:	12012930
Owner Name:	BORGER EARTHWORKS
PO Box:	
Address:	7719-40 ST. S.E.
City:	CALGARY
Postal Code:	T2C 2G9
Province:	ALBERTA

Wells and Additional Sources Detail Report

Country: CANADA

Driller ID: 12000012
 Last Name: QUINLAN
 Middle Initial:
 First Name: CHRIS
 Journeyman No: 48135A
 Is Active?: Yes

Starting Well ID: 1020000
 Ending Well ID: 1024999
 Last Well ID Used: 1023090
 Company Name: AARON DRILLING INC.
 Street Address: 242222 2nd Street East
 City: Foothills
 Province: ALBERTA
 Country: CANADA
 Postal Code: T1S 3K9
 E-Mail: admin@aarondrilling.com
 Is Active?: Yes

Perforation ID: 4274892
 From: 12
 To: 17
 Diameter: 0.02
 Interval: 0.25

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
6	SSW	0.14	137.76	1,079.68	WWIS

Well ID:	12011830	Elevation Source:	Not Obtained
Driller ID:	24041	Method of Drilling:	
Licence No:		GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022280	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	No
Block:		Submitted?:	No
Plan:		Location Locked?:	No
Type of Work:		Longitude:	-114.02442

Wells and Additional Sources Detail Report

Flowing Well:	Latitude:	51.15269
Date Started:	LSD:	13
Water Req Per Day:	Section:	24
Gas Present:	Township:	25
Oil Present:	Range:	1
Flow Rate:	Meridian:	5
Drilling Company:	DLS Coordinates:	13-24-25-1-5
Owner Mailing Address:		
Driller Mailing Address:		

Well Report ID:	12012984	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12013190	Annular Seal from:	0
Driller ID:	12000012	Annular Seal to:	8
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	3.5	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	24
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	20	Artesian Flow Rate:	
Finish Well Depth:	14	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	2	Pump Install Depth:	
Liner Thickness:	0.209	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	14	Well Disinfected?:	Yes
Perforation by:	Machine	Other Log:	
Screen Material:	Plastic	Divert Water Src:	
Screen Size OD:	2	Divert Water Amt:	
Screen Attachment:	Attached To Riser	Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		

Wells and Additional Sources Detail Report

Approval Holder Sign 11/6/2012 0:00:00
Date:
Drilling Report Given to Owner: Yes
Model Output Rating:
Remedial Action:
Flow Control Description:
Pump Type Installed:
Created by: {9643AF3C-582C-4B03-870D-F553D107F23D}
Submitted by: {9643AF3C-582C-4B03-870D-F553D107F23D}
Additional Comments:

Well Owner ID: 12013190
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

Driller ID: 12000012
Last Name: QUINLAN
Middle Initial:
First Name: CHRIS
Journeyman No: 48135A
Is Active?: Yes

Starting Well ID: 1020000
Ending Well ID: 1024999
Last Well ID Used: 1023090
Company Name: AARON DRILLING INC.
Street Address: 242222 2nd Street East
City: Foothills
Province: ALBERTA
Country: CANADA
Postal Code: T1S 3K9
E-Mail: admin@aarondrilling.com
Is Active?: Yes

Perforation ID: 4274973
From: 9
To: 14
Diameter: 0.02

Wells and Additional Sources Detail Report

Interval: 0.25

Borehole ID: 810100
 Diameter: 6.125
 From: 0
 To: 14

Screen ID: 1120233
 From: 9
 To: 14
 Slot Size: 0.02

Pump Test ID: 16010205
 Test Date:
 Start Time: 1/1/1980 11:00:00
 Taken from Top of Casing: No
 Static Water Level: 7
 End Water Level:
 Water Removal Type:
 Water Removal Rate:
 Removal Depth from:
 Reason for Short Test:

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
6	SSW	0.14	137.76	1,079.68	WWIS

Well ID:	12011831	Elevation Source:	Not Obtained
Driller ID:	24041	Method of Drilling:	
Licence No:		GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022281	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	No
Block:		Submitted?:	No
Plan:		Location Locked?:	No
Type of Work:		Longitude:	-114.024421
Flowing Well:		Latitude:	51.152693
Date Started:		LSD:	13
Water Req Per Day:		Section:	24
Gas Present:		Township:	25

Wells and Additional Sources Detail Report

Oil Present:	Range:	1
Flow Rate:	Meridian:	5
Drilling Company:	DLS Coordinates:	13-24-25-1-5
Owner Mailing Address:		
Driller Mailing Address:		

Well Report ID:	12012985	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12013191	Annular Seal from:	0
Driller ID:	12000012	Annular Seal to:	54
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	8	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	65	Artesian Flow Rate:	
Finish Well Depth:	64	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	2	Pump Install Depth:	
Liner Thickness:	0.209	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	6	Well Disinfected?:	Yes
Perforation by:		Other Log:	
Screen Material:	Plastic	Divert Water Src:	
Screen Size OD:	2	Divert Water Amt:	
Screen Attachment:	Attached To Riser	Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	11/6/2012 0:00:00		
Drilling Report Given to Owner:	Yes		
Model Output Rating:			

Wells and Additional Sources Detail Report

Remedial Action:
Flow Control Description:
Pump Type Installed:
Created by: {9643AF3C-582C-4B03-870D-F553D107F23D}
Submitted by: {9643AF3C-582C-4B03-870D-F553D107F23D}
Additional Comments:

Well Owner ID: 12013191
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

Driller ID: 12000012
Last Name: QUINLAN
Middle Initial:
First Name: CHRIS
Journeyman No: 48135A
Is Active?: Yes

Starting Well ID: 1020000
Ending Well ID: 1024999
Last Well ID Used: 1023090
Company Name: AARON DRILLING INC.
Street Address: 242222 2nd Street East
City: Foothills
Province: ALBERTA
Country: CANADA
Postal Code: T1S 3K9
E-Mail: admin@aarondrilling.com
Is Active?: Yes

Borehole ID: 810101
Diameter: 6.125
From: 0
To: 65

Screen ID: 1120234
From: 55

Wells and Additional Sources Detail Report

To: 65
Slot Size: 0.02

Pump Test ID: 16010206
Test Date:
Start Time: 1/1/1980 11:00:00
Taken from Top of Casing: No
Static Water Level: 9
End Water Level:
Water Removal Type:
Water Removal Rate:
Removal Depth from:
Reason for Short Test:

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
9	SE	0.18	178.24	1,089.00	WWIS

Well ID:	408698	Elevation Source:	Not Obtained
Driller ID:	24659	Method of Drilling:	
Licence No:		GPS Obtained:	Map
GIC Well ID:	408698	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	WELL # 1
Lot:		Validated?:	Yes
Block:		Submitted?:	Yes
Plan:		Location Locked?:	Yes
Type of Work:		Longitude:	-114.01735
Flowing Well:		Latitude:	51.15061
Date Started:		LSD:	11
Water Req Per Day:		Section:	24
Gas Present:		Township:	25
Oil Present:		Range:	1
Flow Rate:		Meridian:	5
Drilling Company:		DLS Coordinates:	11-24-25-1-5
Owner Mailing Address:			
Driller Mailing Address:			

Well Report ID:	408698	Annular Seal Mat:	Driven
Well Owner ID:	10687188	Annular Seal from:	0
Driller ID:	2533726	Annular Seal to:	0
Drill Company ID:	24267	Annular Seal Amt:	

Wells and Additional Sources Detail Report

Drill Instance ID:	8335500	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary
Existing Well ID:		Drilling Start Dt:	5/12/1983 0:00:00
Date Received:	8/15/1985 0:00:00	Drilling End Dt:	5/15/1983 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	Map
Well Use:	Domestic & Stock	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	210	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	6.63	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	0
Casing Bottom:	63	Recom Intake Depth:	0
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	4.5	Pump Install Depth:	
Liner Thickness:	0.218	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	210	Well Disinfected?:	No
Perforation by:	Machine	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:	0	Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:			
Drilling Report Given to Owner:	No		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:			
Submitted by:			
Additional Comments:			
Well Owner ID:	10687188		
Owner Name:	BILBEN, BOB		
PO Box:			

Wells and Additional Sources Detail Report

Address: BALZAC
City:
Postal Code:
Province:
Country:

Driller ID: 2533726
Last Name: DRILLER
Middle Initial: NA
First Name: UNKNOWN
Journeyman No: 1
Is Active?: Yes

Starting Well ID:
Ending Well ID:
Last Well ID Used:
Company Name: SANDO DRILLING LTD.
Street Address:
City:
Province:
Country:
Postal Code:
E-Mail:
Is Active?: No

Perforation ID: 4189559
From: 180
To: 200
Diameter: 0
Interval: 0

Geophysical Log ID: 5919261
Log Type: Gamma
Log Taken?: No
Sent to AENV?: No

Geophysical Log ID: 5516186
Log Type: Electric
Log Taken?: No
Sent to AENV?: No

Wells and Additional Sources Detail Report

Borehole ID: 618394
Diameter: 0
From: 0
To: 210

Depth: 55
Water Bearing: No
Colour:
Description:
Material: Clay

Depth: 210
Water Bearing: No
Colour:
Description:
Material: Shale & Sandstone Ledges

Pump Test ID: 10349547
Test Date: 5/15/1983 0:00:00
Start Time: 1/12/1900 0:00:00
Taken from Top of Casing: No
Static Water Level: 60
End Water Level:
Water Removal Type: Unknown
Water Removal Rate: 8
Removal Depth from: 0
Reason for Short Test:

Well Report ID:	12005368	Annular Seal Mat:	
Well Owner ID:	12005420	Annular Seal from:	
Driller ID:	10773525	Annular Seal to:	
Drill Company ID:	24659	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Unknown
Existing Well ID:		Drilling Start Dt:	
Date Received:	1/25/2011 0:00:00	Drilling End Dt:	
Type of Work:	Existing Well-Decommissioned	Pack Type:	
Plug Date:	9/20/2010 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	41	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Unknown	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No

Wells and Additional Sources Detail Report

Total Depth Drill:	210	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	7	Flow Ctrl Install?:	No
Casing Thickness:		Recommended Rate:	
Casing Bottom:		Recom Intake Depth:	
Liner Material:		Pump Installed?:	No
Liner OD:		Pump Install Depth:	
Liner Thickness:		Pump Model:	
Liner Top:		Pump Horsepower:	
Liner Bottom:		Well Disinfected?:	No
Perforation by:		Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:		Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	9/20/2010 0:00:00		
Drilling Report Given to Owner:	No		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:	{5C7BF00A-B7C4-44D2-9347-5EE440D7F884}		
Submitted by:	{5C7BF00A-B7C4-44D2-9347-5EE440D7F884}		
Additional Comments:	CASING COULD NOT BE PULLED. REASON FOR PLUGGING THE WELL: NEW DEVELOPMENT FOR INDUSTRIAL. STATIC WATER LEVEL 74', WELL WAS RECLAIMED WITH 41 BAGS ENVIRO GROUT 30% SOLID. MATERIAL WAS PUMPED FROM BOTTOM TO SURFACE BY DRILL PIPE.		

Well Owner ID:	12005420
Owner Name:	FLINTSTONE CONTRACTING
PO Box:	
Address:	
City:	
Postal Code:	
Province:	ALBERTA
Country:	CANADA

Driller ID:	10773525
Last Name:	GERRITSEN
Middle Initial:	

Wells and Additional Sources Detail Report

First Name: CHRIS
 Journeyman No: 4385Q
 Is Active?: Yes

 Starting Well ID: 1305000
 Ending Well ID: 1309999
 Last Well ID Used: 1305787
 Company Name: GERRITSEN DRILLING
 Street Address: BOX 187
 City: ROCKYFORD
 Province: ALBERTA
 Country: CANADA
 Postal Code: T0J 2R0
 E-Mail: drilling@ccewireless.ca
 Is Active?: Yes

Depth: 210
 Water Bearing: No
 Colour:
 Description:
 Material: Old Well

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
10	ENE	0.18	182.75	1,089.00	WWIS

Well ID:	467800	Elevation Source:	Not Obtained
Driller ID:	24621	Method of Drilling:	
Licence No:		GPS Obtained:	Not Verified
GIC Well ID:	467800	Boundary From:	
GOA Well Tag No:		Distance North:	
Elevation (ft):		Distance South:	
Depth (ft):		Distance East:	
Date Completed:		Distance West:	
Proposed Use:		Additional Desc:	
Lot:		Validated?:	Yes
Block:		Submitted?:	Yes
Plan:		Location Locked?:	Yes
Type of Work:		Longitude:	-114.007577
Flowing Well:		Latitude:	51.158031
Date Started:		LSD:	SE
Water Req Per Day:		Section:	25
Gas Present:		Township:	25
Oil Present:		Range:	1
Flow Rate:		Meridian:	5

Wells and Additional Sources Detail Report

Drilling Company:	DLS Coordinates:	SE-25-25-1-5
Owner Mailing Address:		
Driller Mailing Address:		

Well Report ID:	11426213	Annular Seal Mat:	Unknown
Well Owner ID:	11426214	Annular Seal from:	
Driller ID:	10776669	Annular Seal to:	
Drill Company ID:	24621	Annular Seal Amt:	
Drill Instance ID:	10776670	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Unknown
Existing Well ID:		Drilling Start Dt:	
Date Received:	2/10/2008 0:00:00	Drilling End Dt:	
Type of Work:	Existing Well-Decommissioned	Pack Type:	Unknown
Plug Date:	8/7/2007 0:00:00	Pack Grain Size:	
Plug Material Type:	Cement	Pack Amount:	
Plug Mat Amount:		Pack Units:	Unknown
Plugged Units:		Loc Verify Method:	Not Verified
Well Use:	Unknown	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:		Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Unknown	Encounter Gas?:	No
Casing OD:		Flow Ctrl Install?:	No
Casing Thickness:		Recommended Rate:	
Casing Bottom:		Recom Intake Depth:	
Liner Material:	Unknown	Pump Installed?:	No
Liner OD:		Pump Install Depth:	
Liner Thickness:		Pump Model:	
Liner Top:		Pump Horsepower:	
Liner Bottom:		Well Disinfected?:	No
Perforation by:	Unknown	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:		Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:			
Drilling Report Given to Owner:	No		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			

Wells and Additional Sources Detail Report

Pump Type Installed:

Created by:

Submitted by:

Additional Comments: LOCATED NW CORNER OF COUNTRY HILLS BLVD. AND BARLOW TRAIL. CASING CUT 18 INCHES BELOW GROUND. ENVIRO PLUG MONITORING WELL GROUT WAS USED TO BACKFILL WELL. 25 BAGS. THE ENVIRO PLUG GROUT WAS TREMIE PUMPED INTO HOLE, VERY DIRTY WATER AND SILT DISPLACED FROM WELL DURING GROUTING PROCEDURES.

Well Owner ID: 11426214
Owner Name: CALGARY, CITY OF
PO Box:
Address: BOX 2100 STATION M
City: CALGARY
Postal Code: T2P 2M5
Province: ALBERTA
Country: CA

Driller ID: 10776669
Last Name: WEGLEITNER
Middle Initial:
First Name: GARRY
Journeyman No: 0000
Is Active?: Yes

Starting Well ID: 1125000
Ending Well ID: 1129999
Last Well ID Used: 1125065
Company Name: BECK DRILLING & ENVIRONMENTAL SERVICES LTD.
Street Address: 543 71 AVE SE
City: CALGARY
Province: AB
Country: CA
Postal Code: T2H 2Y2
E-Mail: GWINFO@GOV.AB.CA
Is Active?: No

Geophysical Log ID: 5682844
Log Type: Electric
Log Taken?: No
Sent to AENV?: No

Geophysical Log ID: 6085919
Log Type: Gamma

Wells and Additional Sources Detail Report

Log Taken?: No
Sent to AENV?: No

Pump Test ID: 11426215
Test Date:
Start Time: 1/12/1900 0:00:00
Taken from Top of Casing: No
Static Water Level: 49.5
End Water Level:
Water Removal Type: Unknown
Water Removal Rate:
Removal Depth from:
Reason for Short Test:

Well Report ID:	467800	Annular Seal Mat:	Driven & Bentonite
Well Owner ID:	10741745	Annular Seal from:	0
Driller ID:	2533726	Annular Seal to:	118
Drill Company ID:	24227	Annular Seal Amt:	
Drill Instance ID:	8335390	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary
Existing Well ID:		Drilling Start Dt:	8/20/1997 0:00:00
Date Received:	9/17/1997 0:00:00	Drilling End Dt:	8/25/1997 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	Not Verified
Well Use:	Domestic	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	240	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:		Encounter Gas?:	No
Casing OD:	0	Flow Ctrl Install?:	No
Casing Thickness:	0	Recommended Rate:	2
Casing Bottom:	0	Recom Intake Depth:	155
Liner Material:	Steel	Pump Installed?:	No
Liner OD:	5.56	Pump Install Depth:	
Liner Thickness:	0.188	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	157	Well Disinfected?:	No
Perforation by:	Torch	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:	0	Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes

Wells and Additional Sources Detail Report

Screen Bot Fitting: Is Validated?: Yes
Encounter Saline Water?: No
Saline Water Depth:
Potability Sample Taken?: No
Potable Sample Sent to AENV?: No
Approval Holder Sign Date:
Drilling Report Given to Owner: No
Model Output Rating:
Remedial Action:
Flow Control Description:
Pump Type Installed:
Created by:
Submitted by:
Additional Comments: DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 21". FIELD TEST 550 TDS, SOFT WATER.

Well Owner ID: 10741745
Owner Name: SPRUCE LANE FARMS LTD
PO Box:
Address: 28 AREA RD NE, CALGARY
City:
Postal Code: T2E 8E5
Province:
Country:

Driller ID: 2533726
Last Name: DRILLER
Middle Initial: NA
First Name: UNKNOWN
Journeyman No: 1
Is Active?: Yes

Starting Well ID: 1475000
Ending Well ID: 1479999
Last Well ID Used: 1477040
Company Name: M&M DRILLING CO. LTD.
Street Address: BOX 1, SITE 22, RR 2
City: STRATHMORE
Province: AB
Country: CA
Postal Code: T1P 1K5
E-Mail: murraywh@mmdrilling.ca
Is Active?: Yes

Wells and Additional Sources Detail Report

Perforation ID: 4189416
From: 121
To: 157
Diameter: 0.125
Interval: 10

Geophysical Log ID: 5515828
Log Type: Electric
Log Taken?: No
Sent to AENV?: No

Geophysical Log ID: 5918903
Log Type: Gamma
Log Taken?: No
Sent to AENV?: No

Borehole ID: 618036
Diameter: 0
From: 0
To: 240

Depth: 25
Water Bearing: Yes
Colour: Blue
Description: Water Bearing
Material: Sandstone

Depth: 96
Water Bearing: No
Colour: Blue
Description:
Material: Sandstone

Depth: 155
Water Bearing: No
Colour: Blue
Description:
Material: Sandstone

Wells and Additional Sources Detail Report

Depth: 197
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 215
Water Bearing: No
Colour: Blue
Description:
Material: Sandstone

Depth: 45
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 57
Water Bearing: No
Colour: Blue
Description:
Material: Sandstone

Depth: 152
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 14
Water Bearing: No
Colour: Brown
Description:
Material: Clay & Rocks

Depth: 16
Water Bearing: No
Colour: Brown
Description:
Material: Shale

Wells and Additional Sources Detail Report

Depth: 55
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 20
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 174
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 236
Water Bearing: No
Colour: Blue
Description:
Material: Sandstone

Depth: 47
Water Bearing: No
Colour: Blue
Description:
Material: Sandstone

Depth: 94
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 176
Water Bearing: No
Colour: Dark Blue

Wells and Additional Sources Detail Report

Description:

Material: Sandstone

Depth: 120

Water Bearing: No

Colour: Blue

Description:

Material: Shale

Depth: 229

Water Bearing: No

Colour: Blue

Description:

Material: Shale

Depth: 240

Water Bearing: No

Colour: Blue

Description:

Material: Shale

Pump Test ID: 10379245

Test Date: 8/28/1997 0:00:00

Start Time: 1/12/1900 0:00:00

Taken from Top of Casing: No

Static Water Level: 48

End Water Level: 130

Water Removal Type: Pump

Water Removal Rate: 2.8

Removal Depth from: 156

Reason for Short Test:

Pump Test Item ID: 8189601

Minutes: 8

Pumping Depth: 68.31

Recovery Depth: 110.9

Pump Test Item ID: 8189604

Minutes: 12

Pumping Depth: 74.29

Recovery Depth: 106.33

Wells and Additional Sources Detail Report

Pump Test Item ID: 8189610
Minutes: 35
Pumping Depth: 97.94
Recovery Depth: 85.48

Pump Test Item ID: 8189613
Minutes: 60
Pumping Depth: 113.58
Recovery Depth: 76

Pump Test Item ID: 8189615
Minutes: 90
Pumping Depth: 123.54
Recovery Depth: 68

Pump Test Item ID: 8189606
Minutes: 16
Pumping Depth: 79.63
Recovery Depth: 102.23

Pump Test Item ID: 8189611
Minutes: 40
Pumping Depth: 101.54
Recovery Depth: 84.75

Pump Test Item ID: 8189612
Minutes: 50
Pumping Depth: 107.69
Recovery Depth: 78.63

Pump Test Item ID: 8189596
Minutes: 3
Pumping Depth: 58.85
Recovery Depth: 117.44

Pump Test Item ID: 8189608
Minutes: 25
Pumping Depth: 89.4

Wells and Additional Sources Detail Report

Recovery Depth: 94.54

Pump Test Item ID: 8189609

Minutes: 30

Pumping Depth: 93.88

Recovery Depth: 91.08

Pump Test Item ID: 8189617

Minutes: 120

Pumping Depth: 130.13

Recovery Depth: 62.85

Pump Test Item ID: 8189594

Minutes: 1

Pumping Depth: 53.27

Recovery Depth: 125.04

Pump Test Item ID: 8189595

Minutes: 2

Pumping Depth: 55.58

Recovery Depth: 119.42

Pump Test Item ID: 8189597

Minutes: 4

Pumping Depth: 60.21

Recovery Depth: 116.08

Pump Test Item ID: 8189614

Minutes: 75

Pumping Depth: 118.69

Recovery Depth: 71.13

Pump Test Item ID: 8189616

Minutes: 105

Pumping Depth: 127.29

Recovery Depth: 65.38

Pump Test Item ID: 8189598

Minutes: 5

Wells and Additional Sources Detail Report

Pumping Depth: 62.85
 Recovery Depth: 114.77

Pump Test Item ID: 8189600
 Minutes: 7
 Pumping Depth: 67.13
 Recovery Depth: 112.08

Pump Test Item ID: 8189607
 Minutes: 20
 Pumping Depth: 84.71
 Recovery Depth: 98.44

Pump Test Item ID: 8189599
 Minutes: 6
 Pumping Depth: 113.35
 Recovery Depth:

Pump Test Item ID: 8189602
 Minutes: 9
 Pumping Depth: 70.58
 Recovery Depth: 109.54

Pump Test Item ID: 8189603
 Minutes: 10
 Pumping Depth: 71.58
 Recovery Depth: 108.52

Pump Test Item ID: 8189605
 Minutes: 14
 Pumping Depth: 77.46
 Recovery Depth: 104.15

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
13	NE	0.19	191.45	1,087.00	WWIS

Well ID:	12011273	Elevation Source:	Not Obtained
Driller ID:	24659	Method of Drilling:	
Licence No:		GPS Obtained:	Not Verified
GIC Well ID:	1305458	Boundary From:	

Wells and Additional Sources Detail Report

GOA Well Tag No:	Distance North:
Elevation (ft):	Distance South:
Depth (ft):	Distance East:
Date Completed:	Distance West:
Proposed Use:	Additional Desc:
Lot:	Validated?: No
Block:	Submitted?: No
Plan:	Location Locked?: No
Type of Work:	Longitude: -114.019188
Flowing Well:	Latitude: 51.15792
Date Started:	LSD: SW
Water Req Per Day:	Section: 25
Gas Present:	Township: 25
Oil Present:	Range: 1
Flow Rate:	Meridian: 5
Drilling Company:	DLS Coordinates: SW-25-25-1-5
Owner Mailing Address:	
Driller Mailing Address:	

Well Report ID:	12012196	Annular Seal Mat:	Bentonite Slurry
Well Owner ID:	12012402	Annular Seal from:	0
Driller ID:	12000056	Annular Seal to:	95
Drill Company ID:	24659	Annular Seal Amt:	120
Drill Instance ID:		Annular Seal Units:	Gallons
Drill Comp Well ID:		Drilling Method:	Rotary - Mud
Existing Well ID:		Drilling Start Dt:	9/25/2012 0:00:00
Date Received:	10/2/2012 0:00:00	Drilling End Dt:	9/25/2012 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	
Well Use:	Domestic	Dist Casing Ground:	22
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	232	Artesian Flow Rate:	
Finish Well Depth:	232	Gas Depth:	
Casing Material:	Plastic	Encounter Gas?:	No
Casing OD:	6	Flow Ctrl Install?:	No
Casing Thickness:	0.38	Recommended Rate:	4
Casing Bottom:	95	Recom Intake Depth:	200
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	4.5	Pump Install Depth:	
Liner Thickness:	0.237	Pump Model:	
Liner Top:	90	Pump Horsepower:	
Liner Bottom:	232	Well Disinfected?:	Yes
Perforation by:	Saw	Other Log:	

Wells and Additional Sources Detail Report

Screen Material:		Divert Water Src:	TOWN OF STRATHMORE
Screen Size OD:		Divert Water Amt:	2000
Screen Attachment:		Diversion Dt/Time:	9/26/2012 1:00:00
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	10/2/2012 0:00:00		
Drilling Report Given to Owner:	Yes		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:	{8464950F-7A58-403F-A673-9B788A3F13CA}		
Submitted by:	{8464950F-7A58-403F-A673-9B788A3F13CA}		
Additional Comments:			

Well Owner ID:	12012402
Owner Name:	LEES, TOM
PO Box:	
Address:	11420 -15 STREET NE
City:	CALGARY
Postal Code:	T3K 5Y8
Province:	ALBERTA
Country:	CANADA

Driller ID:	12000056
Last Name:	PHILLIPS
Middle Initial:	
First Name:	MICHAEL
Journeyman No:	136572A
Is Active?:	Yes

Starting Well ID:	1305000
Ending Well ID:	1309999
Last Well ID Used:	1305787
Company Name:	GERRITSEN DRILLING
Street Address:	BOX 187
City:	ROCKYFORD
Province:	ALBERTA
Country:	CANADA

Wells and Additional Sources Detail Report

Postal Code: T0J 2R0
E-Mail: drilling@cciwireless.ca
Is Active?: Yes

Perforation ID: 4274737
From: 202
To: 232
Diameter: 0.187
Interval: 3

Borehole ID: 809497
Diameter: 7.88
From: 0
To: 92

Borehole ID: 809498
Diameter: 5.875
From: 92
To: 95

Borehole ID: 809499
Diameter: 5.125
From: 95
To: 232

Depth: 116
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 136
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 60
Water Bearing: No
Colour: Brown

Wells and Additional Sources Detail Report

Description:

Material: Clay & Rocks

Depth: 105

Water Bearing: No

Colour: Blue

Description:

Material: Shale

Depth: 145

Water Bearing: No

Colour: Gray

Description:

Material: Sandstone

Depth: 231

Water Bearing: No

Colour: Gray

Description:

Material: Sandstone

Depth: 5

Water Bearing: No

Colour: Brown

Description:

Material: Sand

Depth: 176

Water Bearing: No

Colour: Gray

Description:

Material: Shale

Depth: 225

Water Bearing: No

Colour: Gray

Description:

Material: Sandstone

Depth: 2

Wells and Additional Sources Detail Report

Water Bearing: No
Colour: Dark Brown
Description:
Material: Clay

Depth: 77
Water Bearing: No
Colour: Gray
Description:
Material: Clay

Depth: 94
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 197
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 229
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 121
Water Bearing: No
Colour: Gray
Description:
Material: Sandstone

Depth: 141
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Wells and Additional Sources Detail Report

Depth: 185
Water Bearing: No
Colour: Gray
Description:
Material: Sandstone

Depth: 201
Water Bearing: No
Colour: Gray
Description:
Material: Shale & Coal

Depth: 206
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 108
Water Bearing: No
Colour: Gray
Description:
Material: Sandstone

Depth: 128
Water Bearing: No
Colour: Blue
Description:
Material: Shale

Depth: 157
Water Bearing: No
Colour: Gray
Description:
Material: Shale

Depth: 165
Water Bearing: No
Colour: Gray
Description:

Wells and Additional Sources Detail Report

Material: Sandstone

Depth: 232

Water Bearing: No

Colour: Gray

Description:

Material: Shale

Pump Test ID: 16009904

Test Date: 9/27/2012 0:00:00

Start Time: 10/17/2012 9:00:00

Taken from Top of Casing: Yes

Static Water Level: 50.45

End Water Level:

Water Removal Type: PUMP

Water Removal Rate: 3.99

Removal Depth from: 213.25

Reason for Short Test:

Pump Test Item ID: 12167359

Minutes: 18

Pumping Depth: 253.24

Recovery Depth: 385.77

Pump Test Item ID: 12167351

Minutes: 2

Pumping Depth: 167.52

Recovery Depth: 385.47

Pump Test Item ID: 12167368

Minutes: 90

Pumping Depth: 362.13

Recovery Depth: 220.06

Pump Test Item ID: 12167352

Minutes: 4

Pumping Depth: 169.37

Recovery Depth: 385.95

Pump Test Item ID: 12167355

Wells and Additional Sources Detail Report

Minutes: 10
Pumping Depth: 214.72
Recovery Depth: 386.38

Pump Test Item ID: 12167372
Minutes: 156
Pumping Depth:
Recovery Depth: 210.07

Pump Test Item ID: 12167350
Minutes: 0
Pumping Depth: 165.55
Recovery Depth: 385.51

Pump Test Item ID: 12167353
Minutes: 6
Pumping Depth: 171.08
Recovery Depth: 385.97

Pump Test Item ID: 12167370
Minutes: 120
Pumping Depth: 375.21
Recovery Depth: 213.04

Pump Test Item ID: 12167354
Minutes: 8
Pumping Depth: 196.9
Recovery Depth: 386.42

Pump Test Item ID: 12167361
Minutes: 22
Pumping Depth: 266.75
Recovery Depth: 358.97

Pump Test Item ID: 12167367
Minutes: 80
Pumping Depth: 355.61
Recovery Depth: 224.91

Wells and Additional Sources Detail Report

Pump Test Item ID: 12167357
Minutes: 14
Pumping Depth: 237.12
Recovery Depth: 387.01

Pump Test Item ID: 12167362
Minutes: 24
Pumping Depth: 272.29
Recovery Depth: 347.24

Pump Test Item ID: 12167366
Minutes: 60
Pumping Depth: 337.45
Recovery Depth: 242.91

Pump Test Item ID: 12167369
Minutes: 100
Pumping Depth: 367.31
Recovery Depth: 216.8

Pump Test Item ID: 12167356
Minutes: 12
Pumping Depth: 226.73
Recovery Depth: 386.88

Pump Test Item ID: 12167358
Minutes: 16
Pumping Depth: 245.45
Recovery Depth: 387.36

Pump Test Item ID: 12167365
Minutes: 50
Pumping Depth: 324.98
Recovery Depth: 258.96

Pump Test Item ID: 12167360
Minutes: 20
Pumping Depth: 260.48
Recovery Depth: 371.18

Wells and Additional Sources Detail Report

Pump Test Item ID: 12167363
 Minutes: 30
 Pumping Depth: 288.38
 Recovery Depth: 316.33

Pump Test Item ID: 12167364
 Minutes: 40
 Pumping Depth: 308.57
 Recovery Depth: 282.64

Pump Test Item ID: 12167371
 Minutes: 168
 Pumping Depth: 385.51
 Recovery Depth:

Well Licenses

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
3	SSW	0.12	115.65	1,082.00	AERW

Well ID:	Agent:
Well Status:	Operator:
Keylist:	Field:
License No: 0022219	Pool:
Licence Status: RecCertified	OS Area:
Licence Date: 28 Mar 2012	OS Dep:
Stat Date:	Max Tvd:
Well Fluid:	Ground Elevation: 1079
Well Mode:	Surf Loc: 08-23-025-01W5
Well Type:	EDCT: BWL
Well Structure:	Rating Ev: J
Scheme Type:	Op Surv Prov:
Scheme Subt:	FD Date:
Btm/Surface Hole: Surface Holes	Total Dep:
Fluid Short Desc:	KBE: 1083
Mode Short Desc:	Latitude: 51.145166
Type Short Desc:	Longitude: -114.027944
Update:	
Structure Short Description:	
Licensee:	

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
3	SSW	0.12	115.65	1,082.00	AERW

Wells and Additional Sources Detail Report

Well ID:	00/08-23-025-01W5/0	Agent:	
Well Status:	0102000000	Operator:	
Keylist:	0255012308000	Field:	0267
License No:	0022219	Pool:	0176001
Licence Status:	Issued	OS Area:	
Licence Date:	1962-03-06	OS Dep:	0000000
Stat Date:	2011-01-05	Max Tvd:	0
Well Fluid:	CR-OIL	Ground Elevation:	1079
Well Mode:	ABD	Surf Loc:	
Well Type:	N/A	EDCT:	
Well Structure:	N/A	Rating Ev:	
Scheme Type:	Conventional ER	Op Surv Prov:	
Scheme Subt:	Waterflood	FD Date:	1962-04-14
Bttm/Surface Hole:	Bottom Holes	Total Dep:	1783.1
Fluid Short Desc:	CRUDE OIL	KBE:	1083
Mode Short Desc:	ABANDONED	Latitude:	51.145166
Type Short Desc:	Not Applicable	Longitude:	-114.027944
Update:			
Structure Short Description:	Not Applicable		
Licensee:	Bonavista Energy Corporation		

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
7	WSW	0.15	153.22	1,059.91	AERW

Well ID:	F1/14-23-025-01W5/0	Agent:	
Well Status:	0002000000	Operator:	
Keylist:	0255012314F10	Field:	0267
License No:	0038439	Pool:	0000000
Licence Status:	Issued	OS Area:	
Licence Date:	1970-07-17	OS Dep:	0000000
Stat Date:	1970-11-05	Max Tvd:	0
Well Fluid:	N/A	Ground Elevation:	1059.6
Well Mode:	ABD	Surf Loc:	
Well Type:	N/A	EDCT:	
Well Structure:	N/A	Rating Ev:	
Scheme Type:		Op Surv Prov:	
Scheme Subt:		FD Date:	1970-07-28
Bttm/Surface Hole:	Bottom Holes	Total Dep:	228.6
Fluid Short Desc:	Not Applicable	KBE:	1059.6
Mode Short Desc:	ABANDONED	Latitude:	51.152647
Type Short Desc:	Not Applicable	Longitude:	-114.038584
Update:			
Structure Short Description:	Not Applicable		
Licensee:	Direct Energy Marketing Limited		

Wells and Additional Sources Detail Report

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
7	WSW	0.15	153.22	1,059.91	AERW

Well ID:	Agent:
Well Status:	Operator:
Keylist:	Field:
License No: 0038439	Pool:
Licence Status: RecCertified	OS Area:
Licence Date: 28 Nov 2012	OS Dep:
Stat Date:	Max Tvd:
Well Fluid:	Ground Elevation: 1059.6
Well Mode:	Surf Loc: 14-23-025-01W5
Well Type:	EDCT: BWL
Well Structure:	Rating Ev: J
Scheme Type:	Op Surv Prov:
Scheme Subt:	FD Date:
Bttm/Surface Hole: Surface Holes	Total Dep:
Fluid Short Desc:	KBE: 1059.6
Mode Short Desc:	Latitude: 51.152647
Type Short Desc:	Longitude: -114.038584
Update:	
Structure Short Description:	
Licensee:	

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
11	WSW	0.18	183.70	1,059.97	AERW

Well ID:	Agent:
Well Status:	Operator:
Keylist:	Field:
License No: 0022789	Pool:
Licence Status: RecCertified	OS Area:
Licence Date: 29 May 1979	OS Dep:
Stat Date:	Max Tvd:
Well Fluid:	Ground Elevation: 1059.5
Well Mode:	Surf Loc: 14-23-025-01W5
Well Type:	EDCT: BWL
Well Structure:	Rating Ev: J
Scheme Type:	Op Surv Prov:
Scheme Subt:	FD Date:
Bttm/Surface Hole: Surface Holes	Total Dep:
Fluid Short Desc:	KBE: 1063.1
Mode Short Desc:	Latitude: 51.152373
Type Short Desc:	Longitude: -114.038585
Update:	

Wells and Additional Sources Detail Report

Structure Short
Description:
Licensee:

Map Key	Direction	Distance (km)	Distance (m)	Elevation (m)	DB
11	WSW	0.18	183.70	1,059.97	AERW

Well ID:	00/14-23-025-01W5/0	Agent:	
Well Status:	0602030000	Operator:	
Keylist:	0255012314000	Field:	0267
License No:	0022789	Pool:	0176001
Licence Status:	Issued	OS Area:	
Licence Date:	1962-08-01	OS Dep:	0000000
Stat Date:	1973-04-04	Max Tvd:	0
Well Fluid:	WATER	Ground Elevation:	1059.5
Well Mode:	ABD	Surf Loc:	
Well Type:	INJ	EDCT:	
Well Structure:	N/A	Rating Ev:	
Scheme Type:	Conventional ER	Op Surv Prov:	
Scheme Subt:	Waterflood	FD Date:	1962-08-18
Bttm/Surface Hole:	Bottom Holes	Total Dep:	1777.6
Fluid Short Desc:	WATER	KBE:	1063.1
Mode Short Desc:	ABANDONED	Latitude:	51.152373
Type Short Desc:	INJECTION	Longitude:	-114.038585
Update:			
Structure Short	Not Applicable		
Description:			
Licensee:	Devon Canada Corporation		

Radon Information

Detailed radon information for the project property is provided below.

Radon Zone Information

ID: 144850 **Radon Rank:** HIGH

Health Canada Radon Information

Health Region: 4823
Health Region Name: Calgary Health Region
Province or Territory: AB
Number Homes in Survey: 86
% Below 200 Bq/m3: 91.9
% Above 200 Bq/m3: 8.1
200 to 600 Bq/m3: 8.1
% Above 600 Bq/m3: 0

Federal Sources

Bedrock Geology of Canada

The Geological Map of Canada is scaled at 1:5,000,000. This map is created by Geological Survey of Canada and published by Natural Resources Canada.

BEDROCK GEOLOGY

Health Canada Radon Information

This source is the results from the Cross-Canada Survey of Radon Concentrations in Homes, a two-year study conducted by Health Canada's National Radon Program. The aims of this study were to obtain an estimate of the proportion of the Canadian population living in homes with radon gas levels above the guideline of 200 Bq/m³, to identify previously unknown areas where radon gas exposure may constitute a health risk, and to build, over time, a map of indoor radon gas exposure levels across Canada.

RADON

National Energy Board Wells

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

NEBP

Soil Landscapes of Canada (SLC)

Major characteristics of soil and land such as surface form, slope, water table depth, permafrost and lakes.

SLC

Surficial Geology of Canada

This map contains information on surficial materials and associated landforms left by the retreat of the last glaciers and non glacial environments. It is based on compilation of existing maps. This data was authored by the Geological Survey of Canada and published by Natural Resources Canada.

SURFICIAL GEOLOGY

Toporama

Toporama covers the entire area of Canada's landmass and provides topographic, geo-referenced, and symbolic information in a raster format at 1:50,000 scale. This is a digital topographic reference product made available by Natural Resources Canada (NRCan).

TOPORAMA

Provincial Sources

Alberta Detailed Soil Survey (DSS3)

Soil surveys have been published for most of the agricultural areas, and many surrounding areas, across Canada. Data from these surveys comprise the most detailed soil inventory information in the National Soil DataBase. Data is made available by Agriculture and Agri-Food Canada

SOIL SURVEY

Alberta Oil and Gas Wells

The Alberta Energy Utilities Board - now the Alberta Energy Regulator (AER) - maintained a database of oil and gas wells drilled in the province of Alberta. The database contains information on well name, licensee name, license number, location, status, total well depth and date of final drilling. Please note that this database will not be updated, information on wells drilled after September 2003 can be found in the Oil and Gas Wells (OGW) database under the 'Private Source Database' section.

AOGW

Alberta Orphan Wells

Orphan wells are wells that have not been properly abandoned and whose operators are defunct or insolvent. In Alberta, orphan wells fall under the responsibility of the Orphan Well Association, which works under the the delegated authority of the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB). The data includes Location, Well ID, License Name and License Number.

ORP

Alberta Water Well Information Database

List of wells in the Alberta Water Well Information Database made available by Alberta Environment and Parks, containing approximately 500,000 records with nearly 5,000 drilling reports added annually. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location; some locations will be accurate to the quarter section only. The Province of Alberta advises that the data may not be fully checked, and disclaims all responsibility for its accuracy. This data was previously collected from the Groundwater Information

WWIS

Center of the Natural Resource Service.

Bedrock Geology of Alberta

This dataset represents the compilation of existing geological maps and original geological mapping by Alberta Geological Survey (AGS) staff. Mapping in support of the dataset included field observations and creating three-dimensional models of subsurface stratigraphy based on the interpretation of geophysical logs from oil and gas wells. Each three-dimensional formation surface was projected to a model of the bedrock surface, and the intersection formed the first approximation of the position of the geological contact at the base of the surficial deposits. This data is made available by Alberta Geological Survey.

BEDROCK GEOLOGY

Groundwater Well Network

Groundwater level, chemical analysis and water quality data from monitoring wells that are part of the Groundwater Observation Well Network (GOWN).

GROUNDWATER

Horizontal Wells

Defined as drilling directionally at a wellbore inclination angle exceeding 85 degrees, horizontal drilling can help increase resource recovery while minimizing surface impact. Recent improvements in the technology have made it possible to combine horizontal drilling with hydraulic fracturing to help coax oil and natural gas out of tight rock. Today, more than half of western Canada's wells are being drilled horizontally. Data includes: well locations (LE,LS,SE,TWP,RG,M,E), licence numbers, well names, Business Associate (BA) codes, licensee abbreviations, spud dates, final drilling dates, total depth, true vertical depth, and last updated dates. Made available by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB).

HORW

Surficial Geology of Alberta

This dataset, made available by Alberta Geological Survey, is a compilation of existing surficial map information for Alberta, edited for mapping continuity and generalized to make it suitable for presentation and use at 1:1,000,000 scale. It is the dataset used to create Alberta Geological Survey Map 601: Surficial Geology of Alberta.

SURFICIAL GEOLOGY

Well Licenses

Locations of Well Licenses made available by the Alberta Energy Regulator (AER) as ST37. Includes Active, Suspended, Abandoned, Drilled and Cased Oil, Gas, Crude Bitumen well licenses, as well as Observation, Injection, Disposal, and Undefined well licences.

AERW

Wetlands of Alberta

The Alberta Merged Wetland Inventory depicts wetlands within the province of Alberta for the period 1998 to 2015 classified to the Canadian Wetland Classification System (CWCS) at the major class level: marsh, bog, fen, swamp, and open water. This database is made available by Alberta Environment and Parks.

WETLAND

Private Sources

Oil and Gas Wells

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

OGWW

Radon Zone Information

The Radon Potential Map is developed by Radon Environmental Management Corporation. Its objective was to illustrate the relative variation of radon risk across the country, and in 2011 it published its first geologic Radon Potential Map of Canada.

RADON

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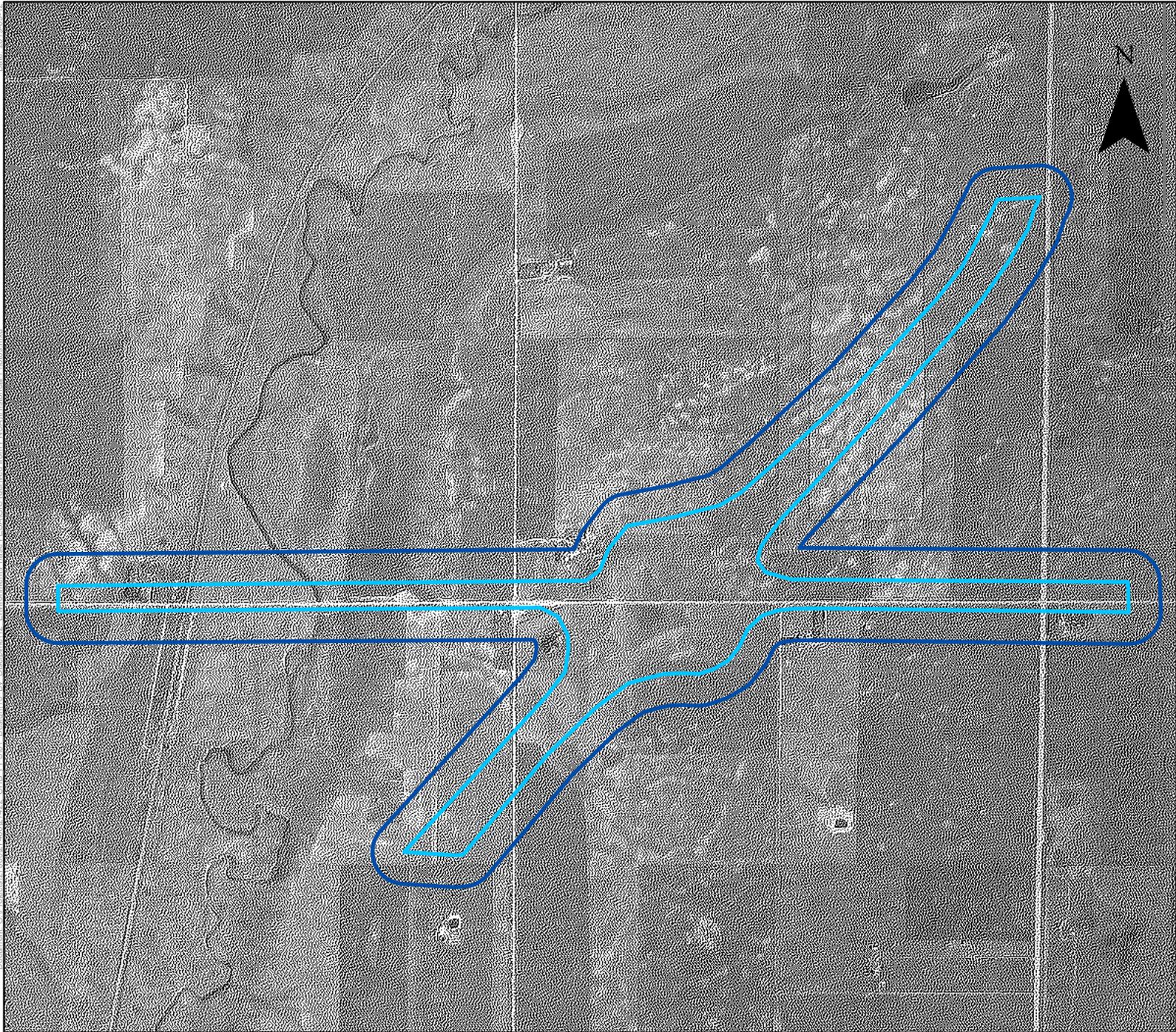
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APPENDIX
Historical Aerial Photographs

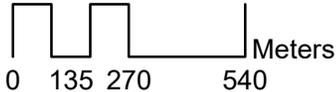
B



Legend

-  Project Area
-  Study Area

1:17,500



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**
HISTORICAL PHOTOGRAPHY
1962

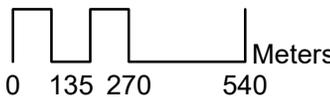




Legend

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-  Study Area

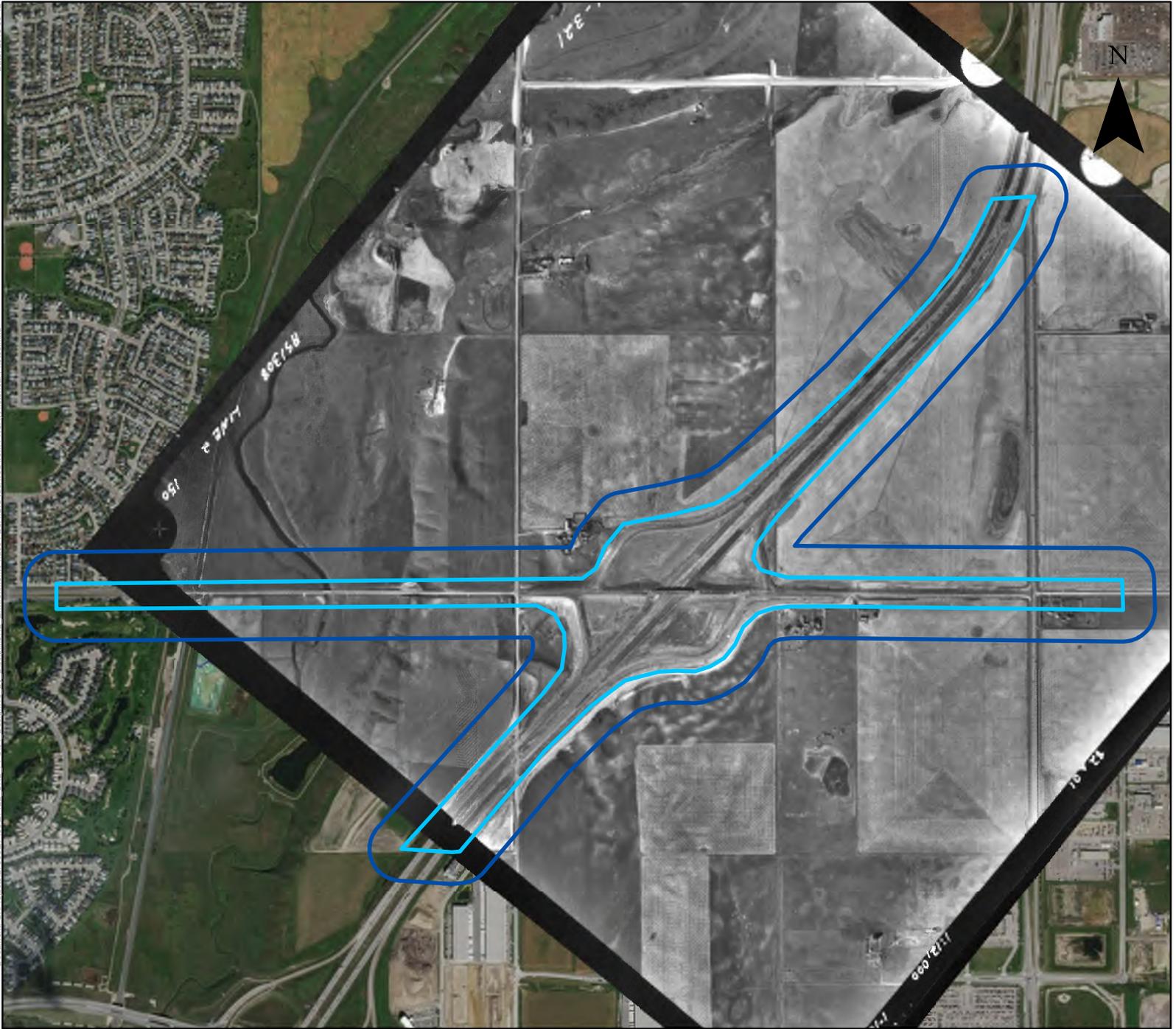
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**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**

**HISTORICAL PHOTOGRAPHY
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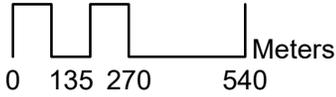




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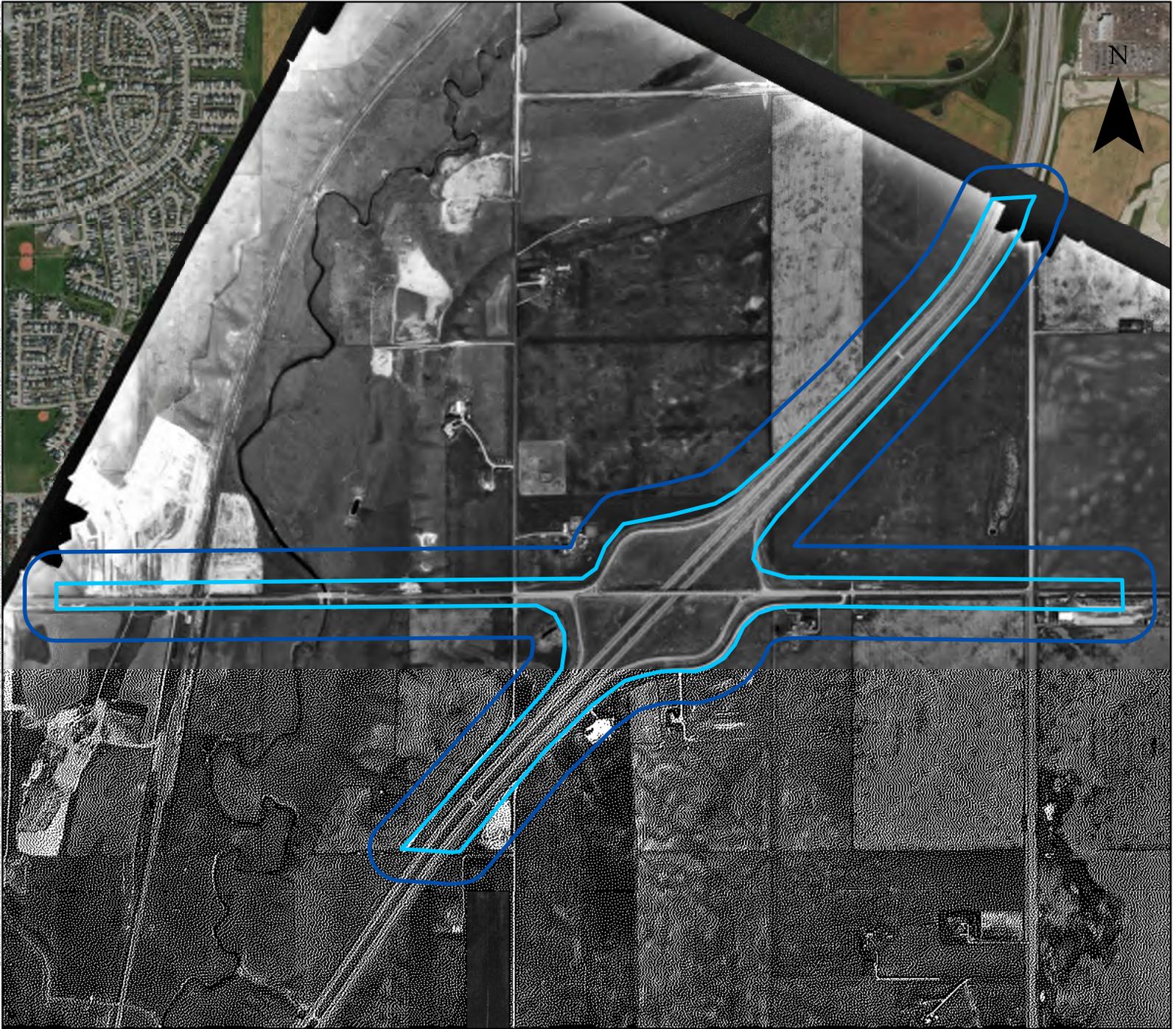
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-  Study Area

1:17,500



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**
**HISTORICAL PHOTOGRAPHY
1971**

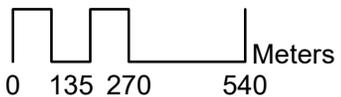




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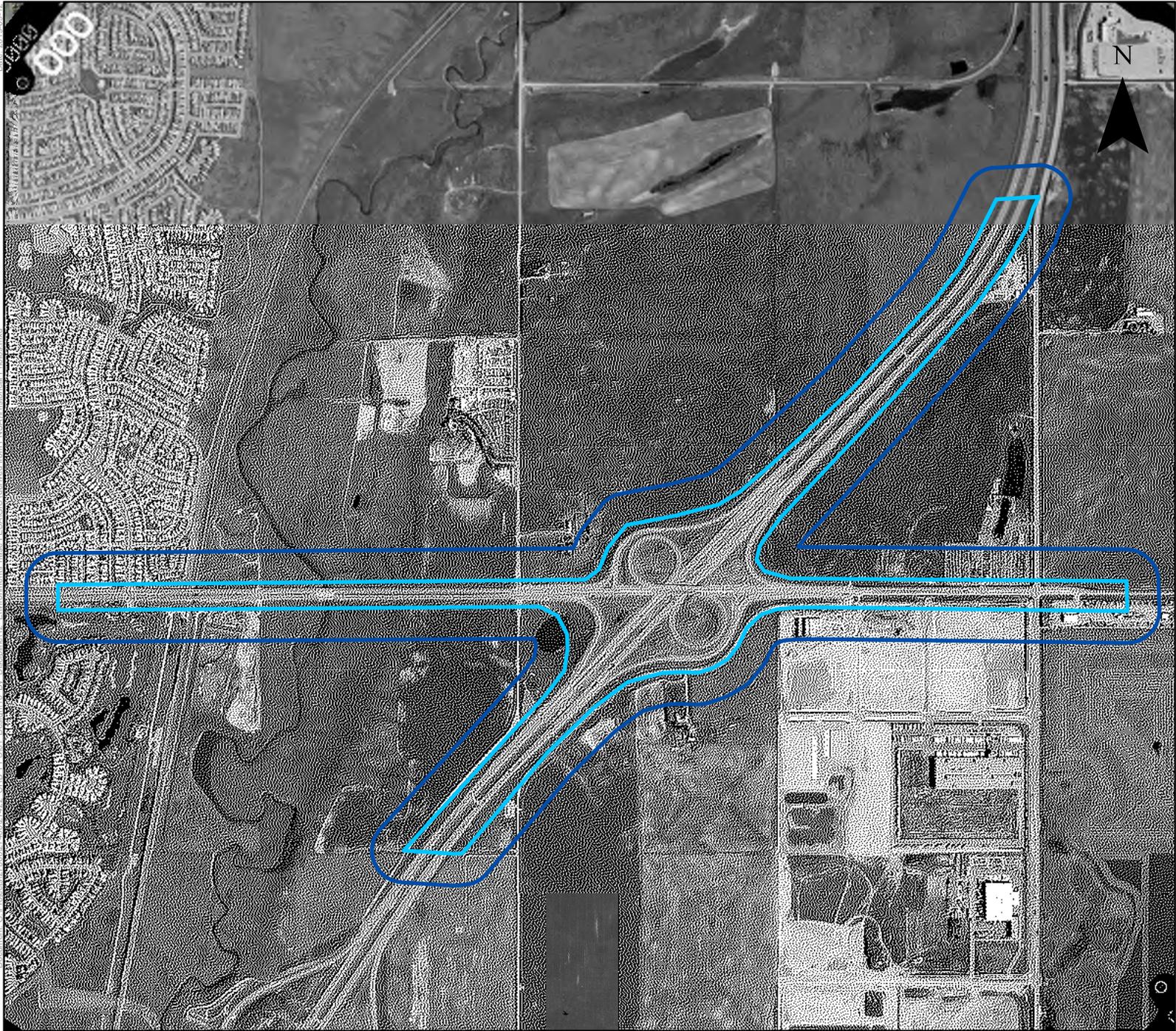
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-  Study Area

1:17,500



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**
HISTORICAL PHOTOGRAPHY
1988

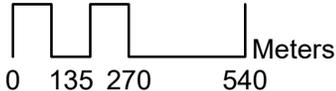




Legend

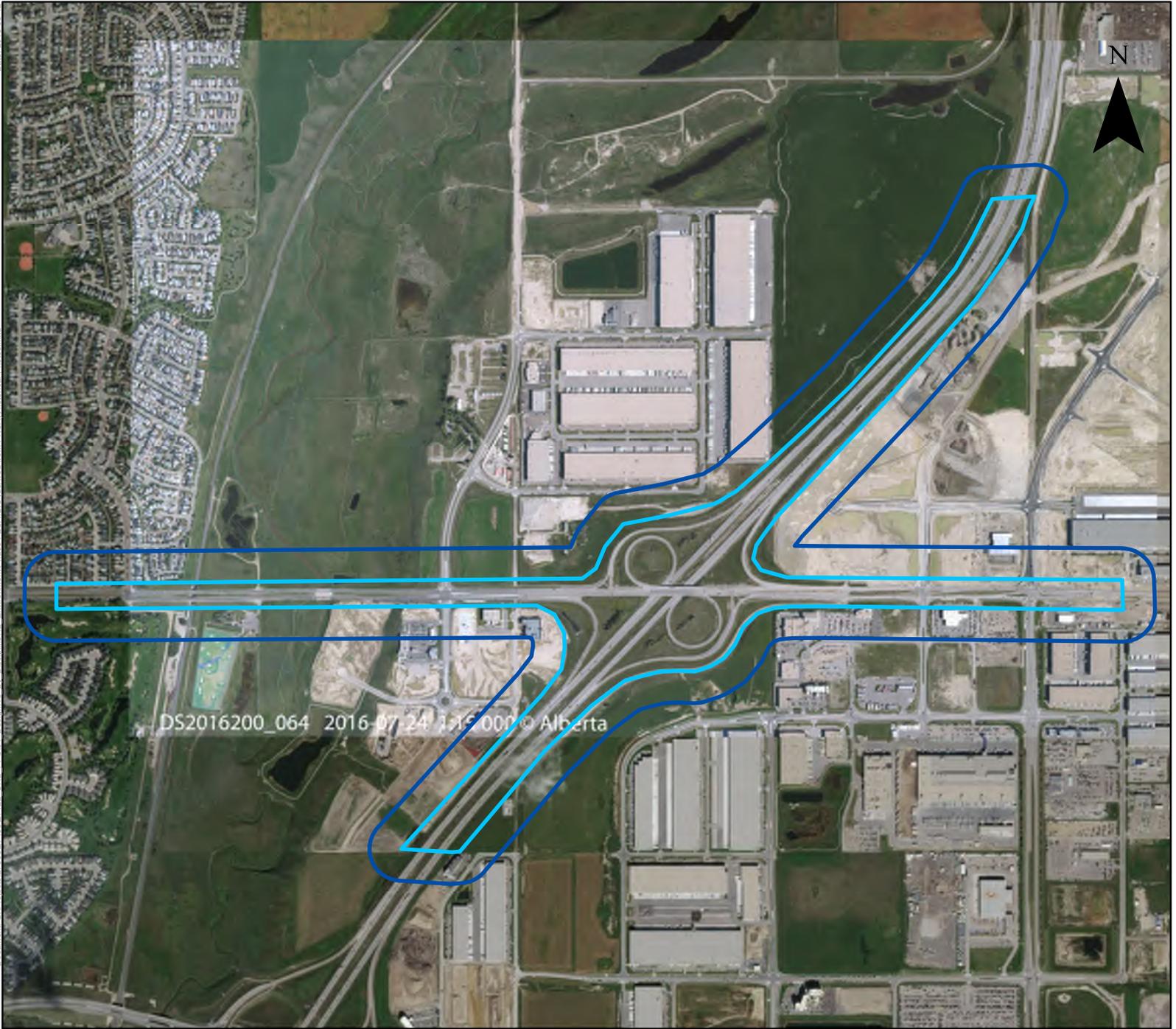
-  Project Area
-  Study Area

1:17,500



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**
**HISTORICAL PHOTOGRAPHY
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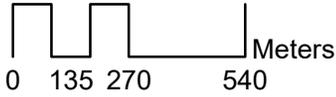




Legend

-  Project Area
-  Study Area

1:17,500



**COUNTRY HILLS BOULEVARD
WIDENING PROJECT**

**HISTORICAL PHOTOGRAPHY
2016**





APPENDIX
Environmental Risk Information Services
Database Report

C



DATABASE REPORT

Project Property: *Country Hills Boulevard Widening
Country Hills Boulevard
Calgary AB*

Project No: *27422*

Report Type: *Quote - Custom-Build Your Own Report*

Order No: *20190808157*

Requested by: *ISL Engineering and Land Services Ltd.*

Date Completed: *August 14, 2019*

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Executive Summary

Property Information:

Project Property: Country Hills Boulevard Widening
Country Hills Boulevard Calgary AB

Project No: 27422

Order Information:

Order No: 20190808157
Date Requested: August 8, 2019
Requested by: ISL Engineering and Land Services Ltd.
Report Type: Quote - Custom-Build Your Own Report

Historical/Products:

ERIS Xplorer [ERIS Xplorer](#)
Physical Setting Report (PSR) PSR

Executive Summary: Report Summary

<i>Database</i>	<i>Name</i>	<i>Searched</i>	<i>Project Property</i>	<i>Boundary to 0.30km</i>	<i>Total</i>
AERW	Well Licenses	Y	0	6	6
AGR	Agriculture and Fisheries - Certificates of Approval	Y	0	0	0
AOGW	Alberta Oil and Gas Wells	Y	0	3	3
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
CAWD	Waste Management Facilities - Certificates of Approval	Y	0	0	0
CBL	Commercial Activity Risk	Y	0	13	13
CDRY	Dry Cleaning Facilities	Y	0	0	0
CFO	Confined Feeding Operations	Y	0	0	0
CHEM	Chemical Processing Operations - Certificates of Approval	Y	0	1	1
CNG	Compressed Natural Gas Stations	Y	0	0	0
CONV	Compliance and Convictions	Y	0	0	0
CTNK	Fuel Sales and Storage	Y	0	3	3
EAS	Enforcement Action Summary	Y	0	0	0
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	N	-	-	-
EIIS	Environmental Issues Inventory System	Y	0	0	0
EPST	Alberta Environment & Parks Storage Tanks	Y	0	0	0
EPWN	Environment Protection & Enhancement Act and Water Act Public Notices	Y	0	0	0
ESAR	Environmental Site Assessment Repository	Y	0	44	44
FAC	Facility List	Y	0	2	2
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FIS	AER Incidents & Spills	Y	0	0	0
FOOD	Food Processing Operations - Certificates of Approval	Y	0	0	0
FST	PTMAA Fuel Storage Tanks	Y	0	6	6
GEN	Waste Generators Summary	Y	0	14	14
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
GPP	Gas Processing Plants	Y	0	0	0
HELP	Alberta Environment's H.E.L.P. (Help End Landfill Pollution) Program Database	Y	0	0	0
HORW	Horizontal Wells	Y	0	0	0
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
LDS	Identification and Verification of Active and Inactive Land Disposal Sites	Y	0	0	0
LDSI	Land Disposal Sites on Indian Reserves	Y	0	0	0
LUM	Lumber Related Operations - Certificates of Approval	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0

Database	Name	Searched	Project Property	Boundary to 0.30km	Total
MMB	<i>Metals, Minerals and Building Materials Operations - Certificates of Approval</i>	Y	0	0	0
MNR	<i>Mineral Occurrences</i>	Y	0	0	0
NATE	<i>National Analysis of Trends in Emergencies System (NATES)</i>	Y	0	0	0
NCST	<i>PTMAA Non-Compliant Storage Tanks</i>	Y	0	0	0
NDFT	<i>National Defense & Canadian Forces Fuel Tanks</i>	Y	0	0	0
NDSP	<i>National Defense & Canadian Forces Spills</i>	Y	0	0	0
NDWD	<i>National Defence & Canadian Forces Waste Disposal Sites</i>	Y	0	0	0
NEBI	<i>National Energy Board Pipeline Incidents</i>	Y	0	0	0
NEBP	<i>National Energy Board Wells</i>	Y	0	0	0
NEES	<i>National Environmental Emergencies System (NEES)</i>	Y	0	0	0
NPCB	<i>National PCB Inventory</i>	Y	0	0	0
NPRI	<i>National Pollutant Release Inventory</i>	Y	0	0	0
OAM	<i>Operating and Abandoned Mines</i>	Y	0	0	0
OGF	<i>Oil and Gas Facilities - ST102 & ST50</i>	Y	0	2	2
OGWW	<i>Oil and Gas Wells</i>	Y	0	0	0
ORP	<i>Alberta Orphan Wells</i>	Y	0	0	0
PAP	<i>Canadian Pulp and Paper</i>	Y	0	0	0
PCFT	<i>Parks Canada Fuel Storage Tanks</i>	Y	0	0	0
PCG	<i>Petrochemical, Coal and Gas Operations - Certificates of Approval</i>	Y	0	0	0
PES	<i>Pesticide Register</i>	Y	0	0	0
PITS	<i>Conglomerate and Waste Management Facilities</i>	Y	0	0	0
PSP	<i>Alberta Private Sewage Disposal Permits</i>	Y	0	0	0
PTAP	<i>PTMAA Approved (Open) Permits</i>	Y	0	0	0
REC	<i>Hazardous Waste Receivers Summary</i>	Y	0	0	0
RST	<i>Retail Fuel Storage Tanks</i>	Y	0	1	1
SCT	<i>Scott's Manufacturing Directory</i>	Y	0	4	4
SPEC	<i>Special Operation Classifications - Certificates of Approval</i>	Y	0	0	0
WDS	<i>Inventory of Waste Disposal Sites</i>	Y	0	0	0
WSTE	<i>Wastewater Operations</i>	Y	0	1	1
WWIS	<i>Alberta Water Well Information Database</i>	Y	0	10	10
Total:			0	110	110

Executive Summary: Site Report Summary - Project Property

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev diff (m)</i>	<i>Page Number</i>
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No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
1	WWIS		AB Well ID: 498388	NE/0.9	5.14	31
2	ESAR	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	SSW/11.3	1.14	37
2	ESAR	Reclamation	NE-23-25-1-5 AB	SSW/11.3	1.14	38
2	ESAR	Reclamation	8-26-25-1-5 AB	SSW/11.3	1.14	38
2	ESAR	Reclamation	NE-23-25-1-5 AB	SSW/11.3	1.14	39
3	ESAR		Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	S/18.4	1.83	39
3	ESAR	Reclamation	NW-24-25-1-5 AB	S/18.4	1.83	39
4	CBL	MERCEDES-BENZ COUNTRY HILLS	2450 COUNTRY HILLS BV NE AB	E/21.0	10.90	40
4	CTNK	MERCEDES-BENZ COUNTRY HILLS	2450 COUNTRY HILLS BV NE AB	E/21.0	10.90	40
5	ESAR	Reclamation	SW-25-25-1-5 AB	ENE/24.5	7.71	40
5	ESAR	Reclamation	SW-25-25-1-5 AB	ENE/24.5	7.71	41
5	ESAR	Reclamation	SW-25-25-1-5 AB	ENE/24.5	7.71	41

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
5	ESAR	Reclamation	SW-25-25-1-5 AB	ENE/24.5	7.71	42
6	CBL	COUNTRY HILLS AUTOMOTIVE	2307 COUNTRY HILLS BV NE AB	E/26.8	10.13	42
6	FST	COUNTRY HILLS HYUNDAI	2307-COUNTRY HILLS BLVD. NE CALGARY T3J 5E3 AB AB T3J 5E3	E/26.8	10.13	42
7	WWIS		AB Well ID: 12011832	SSW/33.9	-0.86	43
8	CTNK	DEERFOOT SHELL	11175 14 ST NE AB	W/34.1	-1.81	45
8	FST	SHELL FUELING STATION & CONVENIENCE STORE	11175-14 STREET NE CALGARY AB AB	W/34.1	-1.81	45
9	CBL	COUNTRY HILLS NISSAN	2451 COUNTRY HILLS BV NE AB	E/34.8	11.19	46
10	CBL	SENS-NET CANADA	11141 15 ST NE AB	WSW/48.5	1.06	46
11	CBL	COUNTRY HILLS TOYOTA	20 FREEPORT LD NE AB	E/88.4	12.14	46
12	ESAR	GENSTAR DEVELOPMENTS CO	Calgary NW 23-25-1 W5M AB	W/97.4	-16.86	47
12	ESAR	Reclamation	14-23-25-1-5 AB	W/97.4	-16.86	47
12	ESAR	GENSTAR	Calgary PORTION OF 10820 6 ST NE AB	W/97.4	-16.86	47
12	ESAR	Reclamation	NE-23-25-1-5 AB	W/97.4	-16.86	48

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
12	ESAR	Reclamation	NE-23-25-1-5 AB	W/97.4	-16.86	48
12	ESAR	Reclamation	8-26-25-1-5 AB	W/97.4	-16.86	49
12	ESAR	Reclamation	14-23-25-1-5 AB	W/97.4	-16.86	49
12	ESAR	Reclamation	NW-23-25-1-5 AB	W/97.4	-16.86	50
13	ESAR	Reclamation	8-23-25-1-5 AB	SSW/104.9	1.14	50
13	ESAR	Reclamation	8-23-25-1-5 AB	SSW/104.9	1.14	50
13	ESAR	Reclamation	8-23-25-1-5 AB	SSW/104.9	1.14	51
13	ESAR	Reclamation	8-23-25-1-5 AB	SSW/104.9	1.14	51
14	AERW	PIONEER CANADA CROSSFIELD 8-23-25-1	AB Well ID: 00/08-23-025-01W5/0	SSW/115.7	2.14	52
14	AERW	Bonavista Energy Corporation(A5RX)	AB	SSW/115.7	2.14	52
14	FAC	Bonavista Energy Corporation	AB	SSW/115.7	2.14	53
14	OGF	Northstar Crossfield 08-23	8-23-25-1-W5 AB	SSW/115.7	2.14	53
15	WWIS		AB	NNE/122.4	5.14	53

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 408700			
16	CBL	A R I FINANCIAL SERVICES	#31 112 FREEPORT CR NE AB	SSW/123.8	1.14	62
17	ESAR	Reclamation	8-26-25-1-5 AB	WSW/128.3	-17.22	62
17	ESAR	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	WSW/128.3	-17.22	62
17	ESAR	Reclamation	NE-23-25-1-5 AB	WSW/128.3	-17.22	63
17	ESAR	Reclamation	NE-23-25-1-5 AB	WSW/128.3	-17.22	63
18	WWIS		AB Well ID: 408701	WNW/136.3	0.14	63
19	WWIS		AB Well ID: 12011600	SSW/137.8	-0.18	66
19	WWIS		AB Well ID: 12011831	SSW/137.8	-0.18	68
19	WWIS		AB Well ID: 12011830	SSW/137.8	-0.18	70
20	CBL	COUNTRY HILLS VOLKSWAGEN	11380 STONEHILL DR NE AB	ENE/141.5	10.14	72
21	AERW	DEML CROSS 14-23-25-1	AB Well ID: F1/14-23-025-01W5/0	W/153.2	-19.95	73
21	AERW	Direct Energy Marketing Limited(ORC3)	AB	W/153.2	-19.95	73
22	ESAR	Reclamation	14-23-25-1-5 AB	W/166.6	-18.94	74

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
22	ESAR	Reclamation	14-23-25-1-5 AB	W/166.6	-18.94	74
22	ESAR	Reclamation	14-23-25-1-5 AB	W/166.6	-18.94	75
22	ESAR	Reclamation	14-23-25-1-5 AB	W/166.6	-18.94	75
23	AOGW		AB <i>Licence NO: 0022219</i>	SSW/168.5	2.14	75
24	FST	AVEDA TRANSPORTATION AND ENERGY SERVICES	2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB T3N 1A6	E/174.4	14.08	76
24	FST	AVEDA TRANSPORTATION AND ENERGY SERVICES	2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB T3N 1A6	E/174.4	14.08	76
24	FST	AVEDA TRANSPORTATION AND ENERGY SERVICES	2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB	E/174.4	14.08	76
24	SCT	Finnie Hauling & Storage Ltd.	2505 Country Hills Blvd NE Calgary AB T3N 1A6	E/174.4	14.08	77
24	SCT	Phoenix Oilfield Hauling Inc.	2505 Country Hills Blvd NE Calgary AB T3N 1A6	E/174.4	14.08	77
25	CBL	JIFFY LUBE	#150 11135 14 ST NE AB	WSW/177.1	2.00	77
25	RST	JIFFY LUBE	11135 14 ST NE APT 150 CALGARY AB T3K0Z7	WSW/177.1	2.00	77
26	CBL	NOVATEL	10921 14 ST NE AB	SW/177.5	-0.31	78
27	WWIS		AB	SE/178.2	9.14	78

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 408698			
28	ESAR	Reclamation	NW-24-25-1-5 AB	SE/179.5	7.14	82
28	ESAR		Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	SE/179.5	7.14	82
28	ESAR		Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	SE/179.5	7.14	83
28	ESAR	Reclamation	NW-24-25-1-5 AB	SE/179.5	7.14	83
28	ESAR		Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	SE/179.5	7.14	84
28	ESAR	Reclamation	NW-24-25-1-5 AB	SE/179.5	7.14	84
29	CHEM	One Man and a Ladybug Ltd.	327 Coventry Close NE Calgary AB T3K 4C5	W/179.8	-2.86	84
30	WWIS		AB Well ID: 467800	ENE/182.8	9.14	85
31	AERW	PIONEER CANADA CROSSFIELD 14-23-25-1	AB Well ID: 00/14-23-025-01W5/0	WSW/183.7	-19.89	94
31	AERW	Devon Canada Corporation(0K29)	AB	WSW/183.7	-19.89	95
32	FAC		AB	WSW/185.1	-19.83	95
32	OGF	Baysel Cross R1 15-23-25-1	AB	WSW/185.1	-19.83	95

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
33	AOGW		AB <i>Licence NO:</i> 0022789	WSW/185.8	-19.89	96
33	AOGW		AB <i>Licence NO:</i> 0038439	WSW/185.8	-19.89	96
34	WWIS		AB <i>Well ID:</i> 12011273	NNE/191.5	7.14	96
35	CBL	PETRO-CANADA / A & W	2600 COUNTRY HILLS BV NE AB	E/195.5	14.09	105
35	CTNK	PETRO-CANADA / A & W	2600 COUNTRY HILLS BV NE AB	E/195.5	14.09	105
35	FST	STONEGATE NEIGHBOURS 77872	2600-COUNTRY HILLS BLVD. NE CALGARY AB AB	E/195.5	14.09	105
36	CBL	COUNTRY HILLS COLLISION	24 FREEPORT LD NE AB	E/209.0	13.12	106
37	ESAR	Reclamation	NE-23-25-1-5 AB	SW/216.8	-2.72	106
37	ESAR	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	SW/216.8	-2.72	106
37	ESAR	Reclamation	NE-23-25-1-5 AB	SW/216.8	-2.72	107
37	ESAR	Reclamation	8-26-25-1-5 AB	SW/216.8	-2.72	107
38	GEN	Harmony Logistics (Excl)	1724 - 115 AVE NE Calgary AB T3K 0P9	NNE/225.1	6.14	107
38	GEN	Harmony Logistics (Excl)	1724 - 115 AVE NE Calgary AB T3K 0P9	NNE/225.1	6.14	108

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
38	GEN	Harmony Logistics (Exel)	1724 - 115 AVE NE Calgary AB T3K 0P9 AB	NNE/225.1	6.14	108
38	GEN	Harmony Logistics (Exel)	1724 - 115 AVE NE Calgary AB T3K 0P9 AB	NNE/225.1	6.14	108
38	GEN	Harmony Logistics (Exel)	1724 - 115 AVE NE Calgary AB T3K 0P9 AB	NNE/225.1	6.14	108
39	ESAR	Reclamation	8-26-25-1-5 AB	WSW/226.7	-20.86	108
39	ESAR	Reclamation	NE-23-25-1-5 AB	WSW/226.7	-20.86	109
39	ESAR	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	WSW/226.7	-20.86	109
39	ESAR	Reclamation	NE-23-25-1-5 AB	WSW/226.7	-20.86	109
40	CBL	COMPLETION TOOLS	#40 10221 15 ST NE AB	S/251.6	3.45	110
41	WSTE	City of Calgary	Calgary AB	SW/259.3	-0.17	110
42	CBL	RUN DIGITAL	#118 10707 25 ST NE AB	E/282.1	14.09	110
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	ESE/283.3	9.14	110
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	ESE/283.3	9.14	111
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB T3J 5J9	ESE/283.3	9.14	111

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev Diff (m)</i>	<i>Page Number</i>
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	ESE/283.3	9.14	111
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	ESE/283.3	9.14	111
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	ESE/283.3	9.14	111
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	ESE/283.3	9.14	111
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	ESE/283.3	9.14	112
43	GEN	K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	ESE/283.3	9.14	112
43	SCT	Can West Projects Inc.	202-90 Freeport Blvd NE Calgary AB T3J 5J9	ESE/283.3	9.14	112
43	SCT	K'(Prime) Technologies	105-90 Freeport Blvd NE Calgary AB T3J 5J9	ESE/283.3	9.14	112

Executive Summary: Summary By Data Source

AERW - Well Licenses

A search of the AERW database, dated Sep 30, 2018 has found that there are 6 AERW site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
Bonavista Energy Corporation(A5RX)	AB	115.7	<u>14</u>
PIONEER CANADA CROSSFIELD 8-23-25-1	AB <i>Well ID: 00/08-23-025-01W5/0</i>	115.7	<u>14</u>
DEML CROSS 14-23-25-1	AB <i>Well ID: F1/14-23-025-01W5/0</i>	153.2	<u>21</u>
Direct Energy Marketing Limited(0RC3)	AB	153.2	<u>21</u>
PIONEER CANADA CROSSFIELD 14-23-25-1	AB <i>Well ID: 00/14-23-025-01W5/0</i>	183.7	<u>31</u>
Devon Canada Corporation(0K29)	AB	183.7	<u>31</u>

AOGW - Alberta Oil and Gas Wells

A search of the AOGW database, dated 1883-Sept 2003* has found that there are 3 AOGW site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
	AB <i>Licence NO: 0022219</i>	168.5	<u>23</u>
	AB	185.8	<u>33</u>

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
	<i>Licence NO:</i> 0038439		
	AB	185.8	33
	<i>Licence NO:</i> 0022789		

CBL - Commercial Activity Risk

A search of the CBL database, dated Apr 30, 2019 has found that there are 13 CBL site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
MERCEDES-BENZ COUNTRY HILLS	2450 COUNTRY HILLS BV NE AB	21.0	4
COUNTRY HILLS AUTOMOTIVE	2307 COUNTRY HILLS BV NE AB	26.8	6
COUNTRY HILLS NISSAN	2451 COUNTRY HILLS BV NE AB	34.8	9
SENS-NET CANADA	11141 15 ST NE AB	48.5	10
COUNTRY HILLS TOYOTA	20 FREEPORT LD NE AB	88.4	11
A R I FINANCIAL SERVICES	#31 112 FREEPORT CR NE AB	123.8	16
COUNTRY HILLS VOLKSWAGEN	11380 STONEHILL DR NE AB	141.5	20
JIFFY LUBE	#150 11135 14 ST NE AB	177.1	25

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
NOVATEL	10921 14 ST NE AB	177.5	<u>26</u>
PETRO-CANADA / A & W	2600 COUNTRY HILLS BV NE AB	195.5	<u>35</u>
COUNTRY HILLS COLLISION	24 FREEPORT LD NE AB	209.0	<u>36</u>
COMPLETION TOOLS	#40 10221 15 ST NE AB	251.6	<u>40</u>
RUN DIGITAL	#118 10707 25 ST NE AB	282.1	<u>42</u>

CHEM - Chemical Processing Operations - Certificates of Approval

A search of the CHEM database, dated 1993-2012 has found that there are 1 CHEM site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
One Man and a Ladybug Ltd.	327 Coventry Close NE Calgary AB T3K 4C5	179.8	<u>29</u>

CTNK - Fuel Sales and Storage

A search of the CTNK database, dated Jun 30, 2019 has found that there are 3 CTNK site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
MERCEDES-BENZ COUNTRY HILLS	2450 COUNTRY HILLS BV NE AB	21.0	<u>4</u>
DEERFOOT SHELL	11175 14 ST NE AB	34.1	<u>8</u>

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
PETRO-CANADA / A & W	2600 COUNTRY HILLS BV NE AB	195.5	<u>35</u>

ESAR - Environmental Site Assessment Repository

A search of the ESAR database, dated 1960-Apr 2019 has found that there are 44 ESAR site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	11.3	<u>2</u>
Reclamation	NE-23-25-1-5 AB	11.3	<u>2</u>
Reclamation	8-26-25-1-5 AB	11.3	<u>2</u>
Reclamation	NE-23-25-1-5 AB	11.3	<u>2</u>
	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	18.4	<u>3</u>
Reclamation	NW-24-25-1-5 AB	18.4	<u>3</u>
Reclamation	SW-25-25-1-5 AB	24.5	<u>5</u>
Reclamation	SW-25-25-1-5 AB	24.5	<u>5</u>
Reclamation	SW-25-25-1-5 AB	24.5	<u>5</u>

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
Reclamation	SW-25-25-1-5 AB	24.5	<u>5</u>
GENSTAR DEVELOPMENTS CO	Calgary NW 23-25-1 W5M AB	97.4	<u>12</u>
GENSTAR	Calgary PORTION OF 10820 6 ST NE AB	97.4	<u>12</u>
Reclamation	NE-23-25-1-5 AB	97.4	<u>12</u>
Reclamation	NE-23-25-1-5 AB	97.4	<u>12</u>
Reclamation	8-26-25-1-5 AB	97.4	<u>12</u>
Reclamation	14-23-25-1-5 AB	97.4	<u>12</u>
Reclamation	NW-23-25-1-5 AB	97.4	<u>12</u>
Reclamation	14-23-25-1-5 AB	97.4	<u>12</u>
Reclamation	8-23-25-1-5 AB	104.9	<u>13</u>
Reclamation	8-23-25-1-5 AB	104.9	<u>13</u>

Site	Address	Distance (m)	Map Key
Reclamation	8-23-25-1-5 AB	104.9	<u>13</u>
Reclamation	8-23-25-1-5 AB	104.9	<u>13</u>
Reclamation	8-26-25-1-5 AB	128.3	<u>17</u>
ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	128.3	<u>17</u>
Reclamation	NE-23-25-1-5 AB	128.3	<u>17</u>
Reclamation	NE-23-25-1-5 AB	128.3	<u>17</u>
Reclamation	14-23-25-1-5 AB	166.6	<u>22</u>
Reclamation	14-23-25-1-5 AB	166.6	<u>22</u>
Reclamation	14-23-25-1-5 AB	166.6	<u>22</u>
Reclamation	14-23-25-1-5 AB	166.6	<u>22</u>
Reclamation	NW-24-25-1-5 AB	179.5	<u>28</u>
	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	179.5	<u>28</u>

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	179.5	<u>28</u>
Reclamation	NW-24-25-1-5 AB	179.5	<u>28</u>
	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	179.5	<u>28</u>
Reclamation	NW-24-25-1-5 AB	179.5	<u>28</u>
Reclamation	NE-23-25-1-5 AB	216.8	<u>37</u>
ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	216.8	<u>37</u>
Reclamation	NE-23-25-1-5 AB	216.8	<u>37</u>
Reclamation	8-26-25-1-5 AB	216.8	<u>37</u>
Reclamation	NE-23-25-1-5 AB	226.7	<u>39</u>
Reclamation	8-26-25-1-5 AB	226.7	<u>39</u>
Reclamation	NE-23-25-1-5 AB	226.7	<u>39</u>

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	AB	226.7	39

FAC - Facility List

A search of the FAC database, dated Up to Jun 30, 2019 has found that there are 2 FAC site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
Bonavista Energy Corporation	AB	115.7	14
	AB	185.1	32

FST - PTMAA Fuel Storage Tanks

A search of the FST database, dated 1985-May 2019 has found that there are 6 FST site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
COUNTRY HILLS HYUNDAI	2307-COUNTRY HILLS BLVD. NE CALGARY T3J 5E3 AB AB T3J 5E3	26.8	6
SHELL FUELING STATION & CONVENIENCE STORE	11175-14 STREET NE CALGARY AB AB	34.1	8
AVEDA TRANSPORTATION AND ENERGY SERVICES	2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB T3N 1A6	174.4	24
AVEDA TRANSPORTATION AND ENERGY SERVICES	2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB T3N 1A6	174.4	24
AVEDA TRANSPORTATION AND ENERGY SERVICES	2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB	174.4	24

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
STONEGATE NEIGHBOURS 77872	2600-COUNTRY HILLS BLVD. NE CALGARY AB AB	195.5	35

GEN - Waste Generators Summary

A search of the GEN database, dated 1993-Aug 2018 has found that there are 14 GEN site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
Harmony Logistics (Excl)	1724 - 115 AVE NE Calgary AB T3K 0P9	225.1	38
Harmony Logistics (Excl)	1724 - 115 AVE NE Calgary AB T3K 0P9	225.1	38
Harmony Logistics (Exel)	1724 - 115 AVE NE Calgary AB T3K 0P9 AB	225.1	38
Harmony Logistics (Exel)	1724 - 115 AVE NE Calgary AB T3K 0P9 AB	225.1	38
Harmony Logistics (Exel)	1724 - 115 AVE NE Calgary AB T3K 0P9 AB	225.1	38
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB T3J 5J9	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	283.3	43

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	283.3	43
K'(Prime) Technologies Incorporated	Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	283.3	43

OGF - Oil and Gas Facilities - ST102 & ST50

A search of the OGF database, dated Apr 30, 2019 has found that there are 2 OGF site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
Northstar Crossfield 08-23	8-23-25-1-W5 AB	115.7	14
Baysel Cross R1 15-23-25-1	AB	185.1	32

RST - Retail Fuel Storage Tanks

A search of the RST database, dated 1999-Jan 31, 2019 has found that there are 1 RST site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
JIFFY LUBE	11135 14 ST NE APT 150 CALGARY AB T3K0Z7	177.1	25

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
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SCT - Scott's Manufacturing Directory

A search of the SCT database, dated 1992-Mar 2011* has found that there are 4 SCT site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
Finnie Hauling & Storage Ltd.	2505 Country Hills Blvd NE Calgary AB T3N 1A6	174.4	24
Phoenix Oilfield Hauling Inc.	2505 Country Hills Blvd NE Calgary AB T3N 1A6	174.4	24
K'(Prime) Technologies	105-90 Freeport Blvd NE Calgary AB T3J 5J9	283.3	43
Can West Projects Inc.	202-90 Freeport Blvd NE Calgary AB T3J 5J9	283.3	43

WSTE - Wastewater Operations

A search of the WSTE database, dated 1993-2012 has found that there are 1 WSTE site(s) within approximately 0.30 kilometers of the project property.

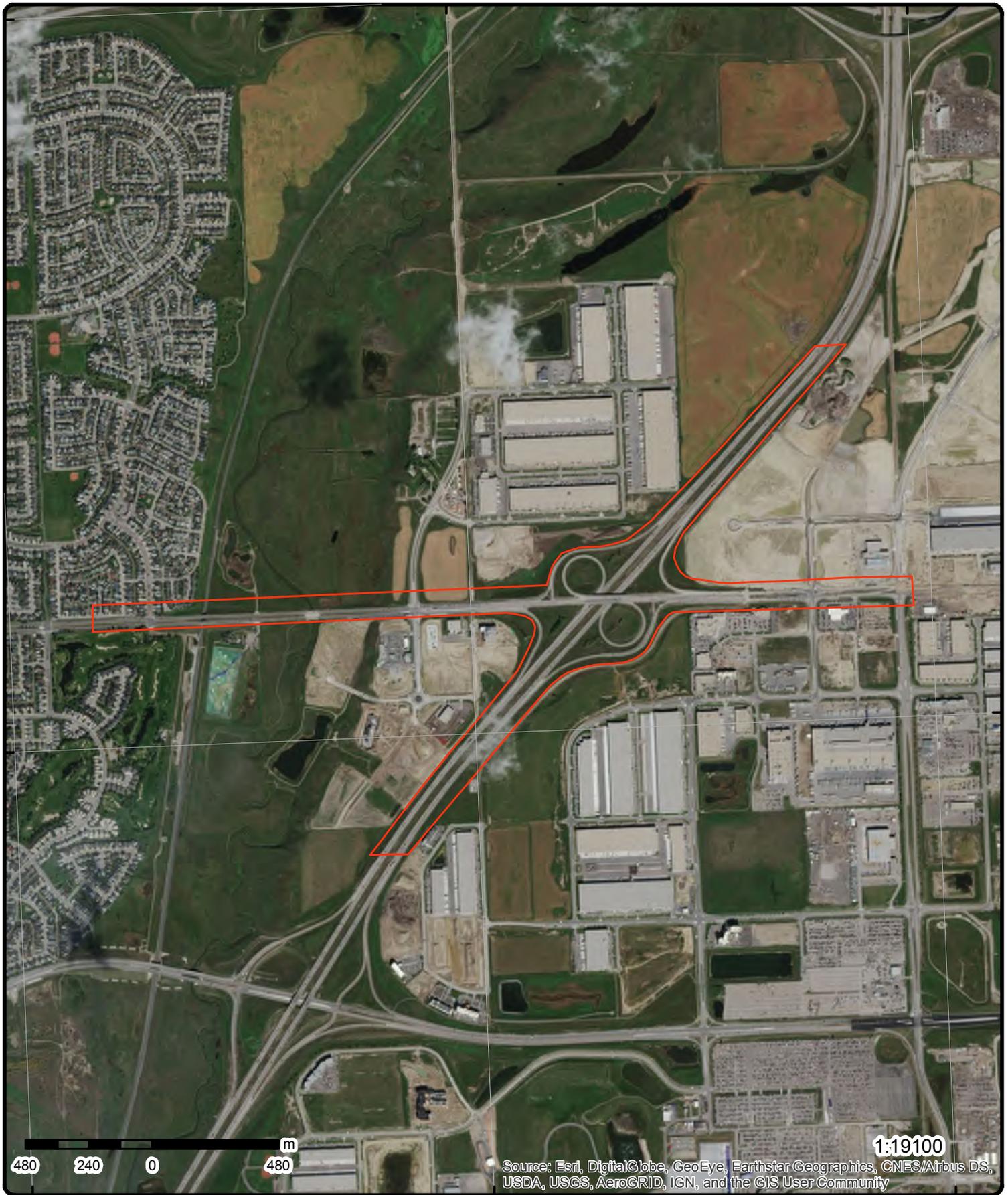
<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
City of Calgary	Calgary AB	259.3	41

WWIS - Alberta Water Well Information Database

A search of the WWIS database, dated 1880-Apr 30, 2019 has found that there are 10 WWIS site(s) within approximately 0.30 kilometers of the project property.

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
	AB	0.9	1

<u>Site</u>	<u>Address</u>	<u>Distance (m)</u>	<u>Map Key</u>
	<i>Well ID:</i> 498388		
	AB	33.9	<u>7</u>
	<i>Well ID:</i> 12011832		
	AB	122.4	<u>15</u>
	<i>Well ID:</i> 408700		
	AB	136.3	<u>18</u>
	<i>Well ID:</i> 408701		
	AB	137.8	<u>19</u>
	<i>Well ID:</i> 12011600		
	AB	137.8	<u>19</u>
	<i>Well ID:</i> 12011831		
	AB	137.8	<u>19</u>
	<i>Well ID:</i> 12011830		
	AB	178.2	<u>27</u>
	<i>Well ID:</i> 408698		
	AB	182.8	<u>30</u>
	<i>Well ID:</i> 467800		
	AB	191.5	<u>34</u>
	<i>Well ID:</i> 12011273		



Aerial (2016)

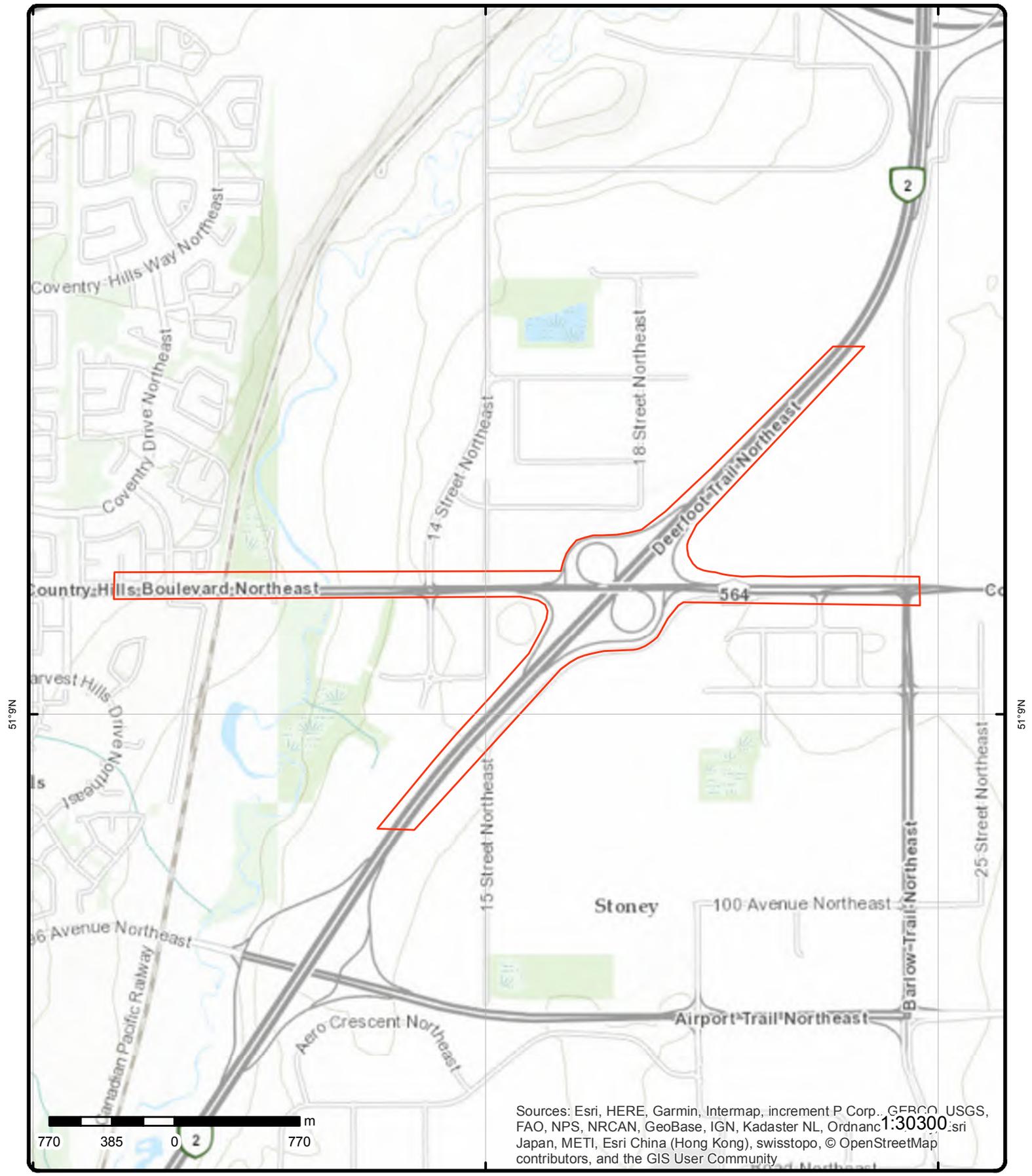
Address: Country Hills Boulevard, Calgary, AB

Source: ESRI World Imagery

Order No: 20190808157



© ERIS Information Limited Partnership



Topographic Map

Address: Country Hills Boulevard, Calgary, AB

Source: ESRI World Topographic Map

Order No: 20190808157



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Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>1</u>	1 of 1	NE/0.9	1,085.0 / 5.14	AB	WWIS

<p>Well ID: 498388 Driller ID: 24540 Licence No: GIC Well ID: 498388 GOA Well Tag No: Elevation (ft): Depth (ft): Date Completed: Proposed Use: Lot: Block: 4 Plan: 8810335 Type of Work: Flowing Well: Date Started: Water Req Per Day: Gas Present: Oil Present: Flow Rate: Drilling Company: Owner Mailing Address: Driller Mailing Address:</p>	<p>Elevation Source: Not Obtained Method of Drilling: GPS Obtained: Not Verified Boundary From: Distance North: Distance South: Distance East: Distance West: Additional Desc: Validated?: Yes Submitted?: Yes Location Locked?: Yes Longitude: -114.007578 Latitude: 51.161647 LSD: EH Section: 25 Township: 25 Range: 1 Meridian: 5 DLS Coordinates: EH-25-25-1-5</p>
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Well Reports

<p>Well Report ID: 498388 Well Owner ID: 10764721 Driller ID: 2533726 Drill Company ID: 24540 Drill Instance ID: 8338342 Drill Comp Well ID: Existing Well ID: Date Received: 6/26/2001 0:00:00 Type of Work: New Well Plug Date: Plug Material Type: Plug Mat Amount: Plugged Units: Well Use: Domestic Other Well Use: Total Depth Drill: 192 Finish Well Depth: Casing Material: Steel Casing OD: 6.62 Casing Thickness: 0.188 Casing Bottom: 38 Liner Material: Plastic Liner OD: 4.5 Liner Thickness: 0.404 Liner Top: 30 Liner Bottom: 192 Perforation by: Saw</p>	<p>Annular Seal Mat: Driven Annular Seal from: 0 Annular Seal to: 38 Annular Seal Amt: Annular Seal Units: Drilling Method: Rotary Drilling Start Dt: 4/26/2001 0:00:00 Drilling End Dt: 4/28/2001 0:00:00 Pack Type: Pack Grain Size: Pack Amount: Pack Units: Loc Verify Method: Not Verified Dist Casing Ground: Artesian Flow?: No Artesian Flow Rate: Gas Depth: Encounter Gas?: No Flow Ctrl Install?: No Recommended Rate: 5 Recom Intake Depth: 180 Pump Installed?: No Pump Install Depth: Pump Model: Pump Horsepower: Well Disinfected?: No Other Log:</p>
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Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Screen Material:				Divert Water Src:	
Screen Size OD:	0			Divert Water Amt:	
Screen Attachment:				Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:		No			
Saline Water Depth:					
Potability Sample Taken?:		No			
Potable Sample Sent to AENV?:		No			
Approval Holder Sign Date:					
Drilling Report Given to Owner:		No			
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:					
Submitted by:					
Additional Comments:		DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 1.5'.			

Well Owners

Well Owner ID: 10764721
Owner Name: ABERHAMSON, AL
PO Box:
Address: 12221 BARLOW TRAIL, CALGARY
City:
Postal Code:
Province:
Country:

Drillers

Driller ID: 2533726
Last Name: DRILLER
Middle Initial: NA
First Name: UNKNOWN
Journeyman No: 1
Is Active?: Yes

Drilling Companies

Starting Well ID: 1635000
Ending Well ID: 1639999
Last Well ID Used: 1635040
Company Name: ROCKYVIEW DRILLING LTD.
Street Address: BOX 226
City: BALZAC
Province: AB
Country: CA
Postal Code: T0M 0E0
E-Mail: gwinfo@gov.ab.ca
Is Active?: No

Perforations

Perforation ID: 4231208
From: 172
To: 192
Diameter: 0.125
Interval: 12

Geophysical Logs

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
Geophysical Log ID:		6059132			
Log Type:		Gamma			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Geophysical Logs</u>					
Geophysical Log ID:		5656057			
Log Type:		Electric			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Boreholes</u>					
Borehole ID:		758130			
Diameter:		0			
From:		0			
To:		192			
<u>Lithologies</u>					
Depth:		48			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		147			
Water Bearing:		No			
Colour:		Dark Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		175			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		56			
Water Bearing:		No			
Colour:		Gray			
Description:		Sandy			
Material:		Shale			
<u>Lithologies</u>					
Depth:		135			
Water Bearing:		No			
Colour:		Brown			
Description:					
Material:		Shale			

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<u>Lithologies</u>					
<i>Depth:</i>			182		
<i>Water Bearing:</i>			Yes		
<i>Colour:</i>					
<i>Description:</i>			Water Bearing		
<i>Material:</i>			Sandstone		
<u>Lithologies</u>					
<i>Depth:</i>			36		
<i>Water Bearing:</i>			No		
<i>Colour:</i>			Brown		
<i>Description:</i>					
<i>Material:</i>			Till		
<u>Lithologies</u>					
<i>Depth:</i>			75		
<i>Water Bearing:</i>			No		
<i>Colour:</i>			Light Gray		
<i>Description:</i>					
<i>Material:</i>			Shale		
<u>Lithologies</u>					
<i>Depth:</i>			105		
<i>Water Bearing:</i>			No		
<i>Colour:</i>			Gray		
<i>Description:</i>					
<i>Material:</i>			Shale		
<u>Lithologies</u>					
<i>Depth:</i>			192		
<i>Water Bearing:</i>			No		
<i>Colour:</i>			Gray		
<i>Description:</i>					
<i>Material:</i>			Shale		
<u>Pump Tests</u>					
<i>Pump Test ID:</i>			10395245		
<i>Test Date:</i>			4/29/2001 0:00:00		
<i>Start Time:</i>			1/9/1900 7:12:00		
<i>Taken from Top of Casing:</i>			No		
<i>Static Water Level:</i>			49		
<i>End Water Level:</i>			70		
<i>Water Removal Type:</i>			Pump		
<i>Water Removal Rate:</i>			15		
<i>Removal Depth from:</i>			180		
<i>Reason for Short Test:</i>					
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			8288971		
<i>Minutes:</i>			0		
<i>Pumping Depth:</i>			49		
<i>Recovery Depth:</i>			70.33		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Pump Test Items</u>					
Pump Test Item ID:		8288979			
Minutes:		8			
Pumping Depth:		64.33			
Recovery Depth:		55.42			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288981			
Minutes:		10			
Pumping Depth:		65.25			
Recovery Depth:		54.5			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288975			
Minutes:		4			
Pumping Depth:		62.25			
Recovery Depth:		61			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288978			
Minutes:		7			
Pumping Depth:		64			
Recovery Depth:		56			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288974			
Minutes:		3			
Pumping Depth:		61.58			
Recovery Depth:		64			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288976			
Minutes:		5			
Pumping Depth:		63			
Recovery Depth:		60			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288984			
Minutes:		16			
Pumping Depth:		66.75			
Recovery Depth:		54			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288988			
Minutes:		35			
Pumping Depth:		68.08			
Recovery Depth:		52.25			
<u>Pump Test Items</u>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Pump Test Item ID:		8288989			
Minutes:		40			
Pumping Depth:		68.17			
Recovery Depth:		52			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288992			
Minutes:		75			
Pumping Depth:		68.67			
Recovery Depth:		51.33			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288972			
Minutes:		1			
Pumping Depth:		58			
Recovery Depth:		69.42			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288980			
Minutes:		9			
Pumping Depth:		64.67			
Recovery Depth:		55			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288982			
Minutes:		12			
Pumping Depth:		65.67			
Recovery Depth:		54.17			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288985			
Minutes:		20			
Pumping Depth:		67.33			
Recovery Depth:		53.67			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288991			
Minutes:		60			
Pumping Depth:		68.42			
Recovery Depth:		51.58			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288987			
Minutes:		30			
Pumping Depth:		67.75			
Recovery Depth:		53			
<u>Pump Test Items</u>					
Pump Test Item ID:		8288990			
Minutes:		50			
Pumping Depth:		68.25			

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<i>Recovery Depth:</i>		51.67			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288995			
<i>Minutes:</i>		120			
<i>Pumping Depth:</i>		70.33			
<i>Recovery Depth:</i>		51			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288973			
<i>Minutes:</i>		2			
<i>Pumping Depth:</i>		65			
<i>Recovery Depth:</i>		65.17			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288983			
<i>Minutes:</i>		14			
<i>Pumping Depth:</i>		66.33			
<i>Recovery Depth:</i>		54			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288986			
<i>Minutes:</i>		25			
<i>Pumping Depth:</i>		67.5			
<i>Recovery Depth:</i>		53.17			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288993			
<i>Minutes:</i>		90			
<i>Pumping Depth:</i>		70			
<i>Recovery Depth:</i>		51.17			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288977			
<i>Minutes:</i>		6			
<i>Pumping Depth:</i>		63.5			
<i>Recovery Depth:</i>		58			
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>		8288994			
<i>Minutes:</i>		105			
<i>Pumping Depth:</i>		70.17			
<i>Recovery Depth:</i>		51			
2	1 of 4	SSW/11.3	1,081.0 / 1.14	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE	ESAR
				AB	
<i>ESA ID:</i>		8058562			
<i>ESRD File:</i>		SCD02333			
<i>File Classification:</i>		SCD			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Name: ALBERTA TRANSPORTATION FORMER DRYWASTE SITE 10tm Point Coordinate: 68070,5664419 LLD: 5;1;25;23;NE 7598JK; LINC: 0035522219 0035522219 0025893330 0035522219 0032569478 Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=8058562 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333					
<u>Document Detail</u>					
Doc Desc: Various Correspondence for Dry Waste Site For Alberta Transportation.pdf					
Doc Date: 8/4/1992					
2	2 of 4	SSW/11.3	1,081.0 / 1.14	Reclamation NE-23-25-1-5 AB	ESAR
ESA ID: 2624469 ESRD File: 00108527 File Classification: REC Name: Reclamation 10tm Point Coordinate: 68070,5664419 LLD: 5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW LINC: Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527					
<u>Document Detail</u>					
Doc Desc: Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M					
Doc Date: 9/14/1982					
<u>Document Detail</u>					
Doc Desc: Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M					
Doc Date: 6/14/1982					
2	3 of 4	SSW/11.3	1,081.0 / 1.14	Reclamation 8-26-25-1-5 AB	ESAR
ESA ID: 2689695 ESRD File: 00108527 File Classification: REC Name: Reclamation 10tm Point Coordinate: 68070,5664419 LLD: 5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW LINC: Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2689695 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527					
<u>Document Detail</u>					
Doc Desc: Reclamation Certificate Documentation - CANPET ET AL CALG CROSS 8-26-25-1					
Doc Date: 5/23/1978					
<u>Document Detail</u>					
Doc Desc: Reclamation Application Documentation - CANPET ET AL CALG CROSS 8-26-25-1					
Doc Date: 2/23/1978					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
2	4 of 4	SSW/11.3	1,081.0 / 1.14	Reclamation NE-23-25-1-5 AB	ESAR
ESA ID: 2624469 ESRD File: SCD02333 File Classification: SCD Name: Reclamation 10tm Point Coordinate: 68070,5664419 LLD: 5;1;25;23;NE 7598JK; LINC: 0035522219 0035522219 0025893330 0035522219 0032569478 Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333					
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M			
Doc Date:		6/14/1982			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M			
Doc Date:		9/14/1982			
3	1 of 2	S/18.4	1,081.7 / 1.83	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	ESAR
ESA ID: 1345558 ESRD File: 00125843 File Classification: REC Name: 10tm Point Coordinate: 68248,5664859 LLD: 5;1;25;24;NW 5;1;25;24;SW LINC: Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=1345558 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00125843					
<u>Document Detail</u>					
Doc Desc:		PHASE II ESA			
Doc Date:		10/1/2008			
<u>Document Detail</u>					
Doc Desc:		PHASE I ESA			
Doc Date:		3/1/2008			
3	2 of 2	S/18.4	1,081.7 / 1.83	Reclamation NW-24-25-1-5 AB	ESAR
ESA ID: 2792955 ESRD File: 00125843 File Classification: REC Name: Reclamation 10tm Point Coordinate: 68248,5664859 LLD: 5;1;25;24;NW 5;1;25;24;SW LINC: Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2792955 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00125843					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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Document Detail

Doc Desc: Reclamation Application Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M
Doc Date: 12/15/1964

Document Detail

Doc Desc: Reclamation Certificate Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M
Doc Date: 3/15/1965

<u>4</u>	1 of 2	E/21.0	1,090.8 / 10.90	MERCEDES-BENZ COUNTRY HILLS 2450 COUNTRY HILLS BV NE AB	CBL
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Comdistnm: STONEGATE LANDING
Latitude: 51.155581855284
Longitude: -114.003020634241
Location: (51.155581855284, -114.003020634241)

City Quadrants: 4
Ward Boundaries: 11
Calgary Communities: 6

Licence Type Information

Licence Types: MOTOR VEHICLE DEALER - PREMISES
Job Status: PENDING RENEWAL
Job Created Date: 2017/05/03

Licence Type Information

Licence Types: MOTOR VEHICLE REPAIR AND SERVICE (1)
Job Status: PENDING RENEWAL
Job Created Date: 2017/05/03

<u>4</u>	2 of 2	E/21.0	1,090.8 / 10.90	MERCEDES-BENZ COUNTRY HILLS 2450 COUNTRY HILLS BV NE AB	CTNK
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Comdistnm: STONEGATE LANDING
Latitude: 51.155581855284
Longitude: -114.003020634241
Location: (51.155581855284, -114.003020634241)

City Quadrants:
Ward Boundaries:
Calgary Communities:

Licence Type Information

Licence Types: FUEL SALES/STORAGE
Job Status: RENEWAL LICENSED
Job Created Date: 2017/05/03

<u>5</u>	1 of 4	ENE/24.5	1,087.6 / 7.71	Reclamation SW-25-25-1-5 AB	ESAR
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ESA ID: 2792879
ESRD File: 00236449
File Classification: REC
Name: Reclamation
10tm Point Coordinate: 68963,5665357
LLD: 5;1;25;25;SW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2792879>

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00236449			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - R OF E CANCELLATION (NOT ABANDONED) IN SW 25- 25- 1 W5M			
Doc Date:		12/2/1964			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - R OF E CANCELLATION (NOT ABANDONED) IN SW 25- 25- 1 W5M			
Doc Date:		3/2/1965			
5	2 of 4	ENE/24.5	1,087.6 / 7.71	Reclamation SW-25-25-1-5 AB	ESAR
ESA ID:		2348636			
ESRD File:		00236449			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		68963,5665357			
LLD:		5;1;25;25;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2348636			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00236449			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation-2 PIPELINES WITHIN SW 25-25-1 W5M			
Doc Date:		12/20/2006			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation-2 PIPELINES WITHIN SW 25-25-1 W5M			
Doc Date:		4/30/2007			
5	3 of 4	ENE/24.5	1,087.6 / 7.71	Reclamation SW-25-25-1-5 AB	ESAR
ESA ID:		2792879			
ESRD File:		00125759			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		68963,5665357			
LLD:		5;1;25;25;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2792879			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00125759			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - R OF E CANCELLATION (NOT ABANDONED) IN SW 25- 25- 1 W5M			
Doc Date:		12/2/1964			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - R OF E CANCELLATION (NOT ABANDONED) IN SW 25- 25- 1 W5M			
Doc Date:		3/2/1965			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
5	4 of 4	ENE/24.5	1,087.6 / 7.71	Reclamation SW-25-25-1-5 AB	ESAR
ESA ID:		2348636			
ESRD File:		00125759			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		68963,5665357			
LLD:		5;1;25;25;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2348636			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00125759			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation-2 PIPELINES WITHIN SW 25-25-1 W5M			
Doc Date:		12/20/2006			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation-2 PIPELINES WITHIN SW 25-25-1 W5M			
Doc Date:		4/30/2007			
6	1 of 2	E/26.8	1,090.0 / 10.13	COUNTRY HILLS AUTOMOTIVE 2307 COUNTRY HILLS BV NE AB	CBL
Comdistnm:		STONEY 2		City Quadrants: 4	
Latitude:		51.1536211301941		Ward Boundaries: 11	
Longitude:		-114.005150648274		Calgary Communities: 13	
Location:		(51.1536211301941, -114.005150648274)			
<u>Licence Type Information</u>					
Licence Types:		MOTOR VEHICLE REPAIR AND SERVICE (1)			
Job Status:		RENEWAL LICENSED			
Job Created Date:		2013/02/06			
<u>Licence Type Information</u>					
Licence Types:		MOTOR VEHICLE DEALER - PREMISES			
Job Status:		RENEWAL LICENSED			
Job Created Date:		2013/02/06			
6	2 of 2	E/26.8	1,090.0 / 10.13	COUNTRY HILLS HYUNDAI 2307-COUNTRY HILLS BLVD. NE CALGARY T3J 5E3 AB AB T3J 5E3	FST
Site No:		8729		Dt Form Rcvd:	
Tank No:				Date Removed:	
No of Tanks:				Removal Reason:	
Tank Type:				Located 200m:	
Tank Status:				Located 500m:	
Site Status:		Active		DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	
Contents:				Plan:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: LLD: Spill Containment: Tank Status by Site Name:				Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4:	
		Active Tanks			
Active Tank Sites					
	UST/AST:	0 / 1			

<u>7</u>	1 of 1	SSW/33.9	1,079.0 / -0.86	AB	WWIS
Well ID:	12011832			Elevation Source:	Not Obtained
Driller ID:	24041			Method of Drilling:	
Licence No:				GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022282			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):				Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	No
Block:				Submitted?:	No
Plan:				Location Locked?:	No
Type of Work:				Longitude:	-114.023391
Flowing Well:				Latitude:	51.153783
Date Started:				LSD:	13
Water Req Per Day:				Section:	24
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5
Drilling Company:				DLS Coordinates:	13-24-25-1-5
Owner Mailing Address:					
Driller Mailing Address:					

Well Reports

Well Report ID:	12012986	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12013192	Annular Seal from:	0
Driller ID:	12000012	Annular Seal to:	44
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	4.5	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	55	Artesian Flow Rate:	
Finish Well Depth:	55	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Liner Material:	Plastic			Pump Installed?:	No
Liner OD:	2			Pump Install Depth:	
Liner Thickness:	0.188			Pump Model:	
Liner Top:	0			Pump Horsepower:	
Liner Bottom:	55			Well Disinfected?:	Yes
Perforation by:				Other Log:	
Screen Material:	Plastic			Divert Water Src:	
Screen Size OD:	2			Divert Water Amt:	
Screen Attachment:	Attached To Riser			Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:	No				
Saline Water Depth:					
Potability Sample Taken?:	No				
Potable Sample Sent to AENV?:	No				
Approval Holder Sign Date:	11/6/2012 0:00:00				
Drilling Report Given to Owner:	Yes				
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:	{9643AF3C-582C-4B03-870D-F553D107F23D}				
Submitted by:	{9643AF3C-582C-4B03-870D-F553D107F23D}				
Additional Comments:					

Well Owners

Well Owner ID: 12013192
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

Drillers

Driller ID: 12000012
Last Name: QUINLAN
Middle Initial:
First Name: CHRIS
Journeyman No: 48135A
Is Active?: Yes

Drilling Companies

Starting Well ID: 1020000
Ending Well ID: 1024999
Last Well ID Used: 1023090
Company Name: AARON DRILLING INC.
Street Address: 242222 2nd Street East
City: Foothills
Province: ALBERTA
Country: CANADA
Postal Code: T1S 3K9
E-Mail: admin@aarondrilling.com
Is Active?: Yes

Boreholes

Borehole ID: 810102

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<hr/>					
Diameter:		6.125			
From:		0			
To:		55			
<u>Screen Type</u>					
Screen ID:		1120235			
From:		45			
To:		55			
Slot Size:		0.02			
<u>Pump Tests</u>					
Pump Test ID:		16010208			
Test Date:					
Start Time:		1/1/1980 11:00:00			
Taken from Top of Casing:		Yes			
Static Water Level:		6.5			
End Water Level:					
Water Removal Type:					
Water Removal Rate:					
Removal Depth from:					
Reason for Short Test:					
<hr/>					
<u>8</u>	1 of 2	W/34.1	1,078.0 / -1.81	DEERFOOT SHELL 11175 14 ST NE AB	CTNK
Comdistnm:	STONEY 1			City Quadrants:	
Latitude:	51.1537726573046			Ward Boundaries:	
Longitude:	-114.028502457194			Calgary Communities:	
Location:	(51.1537726573046, -114.028502457194)				
<u>Licence Type Information</u>					
Licence Types:	FUEL SALES/STORAGE				
Job Status:	RENEWAL INVOICED				
Job Created Date:	2017/05/10				
<hr/>					
<u>8</u>	2 of 2	W/34.1	1,078.0 / -1.81	SHELL FUELING STATION & CONVENIENCE STORE 11175-14 STREET NE CALGARY AB AB	FST
Site No:	9587			Dt Form Rcvd:	
Tank No:				Date Removed:	
No of Tanks:				Removal Reason:	
Tank Type:				Located 200m:	
Tank Status:				Located 500m:	
Site Status:	Active			DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	
Contents:				Plan:	
Other Contents:				Municipality:	
Capacity:				Postal:	
Other Capacity:				Facility 1:	
UST Secondary:				Facility 2:	
AST Secondary:				Facility 3:	
Overfill Prevention:				Facility 4:	
LLD:	NE 1/4 Of Sec. 23 TWP 25 Rge 1 West of Mer 5 Lot 1 Block 3 Plan 1213696				
Spill Containment:					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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Tank Status by Site Name: Active Tanks

Active Tank Sites

UST/AST: 3 / 0

9	1 of 1	E/34.8	1,091.0 / 11.19	COUNTRY HILLS NISSAN 2451 COUNTRY HILLS BV NE AB	CBL
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Comdistnm:	STONEY 2	City Quadrants:	4
Latitude:	51.1534952294772	Ward Boundaries:	11
Longitude:	-114.002871741905	Calgary Communities:	13
Location:	(51.1534952294772, -114.002871741905)		

Licence Type Information

Licence Types: MOTOR VEHICLE DEALER - PREMISES
Job Status: PENDING RENEWAL
Job Created Date: 2018/04/24

Licence Type Information

Licence Types: MOTOR VEHICLE REPAIR AND SERVICE (1)
Job Status: PENDING RENEWAL
Job Created Date: 2018/04/24

10	1 of 1	WSW/48.5	1,080.9 / 1.06	SENS-NET CANADA 11141 15 ST NE AB	CBL
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Comdistnm:	STONEY 1	City Quadrants:	4
Latitude:	51.1536928871936	Ward Boundaries:	11
Longitude:	-114.025977139172	Calgary Communities:	163
Location:	(51.1536928871936, -114.025977139172)		

Licence Type Information

Licence Types: MANUFACTURER
Job Status: RENEWAL LICENSED
Job Created Date: 2014/08/22

11	1 of 1	E/88.4	1,092.0 / 12.14	COUNTRY HILLS TOYOTA 20 FREEPORT LD NE AB	CBL
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Comdistnm:	STONEY 2	City Quadrants:	4
Latitude:	51.1533742034325	Ward Boundaries:	11
Longitude:	-114.012078608474	Calgary Communities:	13
Location:	(51.1533742034325, -114.012078608474)		

Licence Type Information

Licence Types: MOTOR VEHICLE REPAIR AND SERVICE (1)
Job Status: RENEWAL LICENSED
Job Created Date: 2004/09/01

Licence Type Information

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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Licence Types: MOTOR VEHICLE DEALER - PREMISES
Job Status: RENEWAL LICENSED
Job Created Date: 2004/09/01

12	1 of 8	W/97.4	1,063.0 / -16.86	GENSTAR DEVELOPMENTS CO Calgary NW 23-25-1 W5M AB	ESAR
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ESA ID: 1344793
ESRD File: 00139327
File Classification: REC
Name: GENSTAR DEVELOPMENTS CO
10tm Point Coordinate: 67091,5665025
LLD: 5;1;25;23;NW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=1344793>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=00139327>

Document Detail

Doc Desc: CORRESPONDENCE_2
Doc Date: 11/20/1992

Document Detail

Doc Desc: SUPPLEMENTARY HYDROCARBON ASSESSMENT
Doc Date: 6/10/1992

12	2 of 8	W/97.4	1,063.0 / -16.86	Reclamation 14-23-25-1-5 AB	ESAR
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ESA ID: 2574796
ESRD File: 00139327
File Classification: REC
Name: Reclamation
10tm Point Coordinate: 67091,5665025
LLD: 5;1;25;23;NW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2574796>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=00139327>

Document Detail

Doc Desc: Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL
Doc Date: 5/29/1979

Document Detail

Doc Desc: Reclamation Application Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL
Doc Date: 2/28/1979

12	3 of 8	W/97.4	1,063.0 / -16.86	GENSTAR Calgary PORTION OF 10820 6 ST NE AB	ESAR
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ESA ID: 1344499
ESRD File: 00139327
File Classification: REC

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Name:		GENSTAR			
10tm Point Coordinate:		67091,5665025			
LLD:		5;1;25;23;NW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=1344499			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00139327			
<u>Document Detail</u>					
Doc Desc:		SUBSOIL HYDROCARBON ASSESSMENT			
Doc Date:		8/1/1991			
<u>Document Detail</u>					
Doc Desc:		CORRESPONDENCE_3			
Doc Date:		6/22/1999			
<u>Document Detail</u>					
Doc Desc:		CORRESPONDENCE			
Doc Date:		10/3/1991			
<u>Document Detail</u>					
Doc Desc:		SUPPLEMENTAL HYDROCARBON ASSESSMENT			
Doc Date:		6/10/1992			

12	4 of 8	W/97.4	1,063.0 / -16.86	Reclamation NE-23-25-1-5 AB	ESAR
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ESA ID: 2624469
ESRD File: 00139327
File Classification: REC
Name: Reclamation
10tm Point Coordinate: 67091,5665025
LLD: 5;1;25;23;NW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=00139327>

Document Detail

Doc Desc: Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 6/14/1982

Document Detail

Doc Desc: Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 9/14/1982

12	5 of 8	W/97.4	1,063.0 / -16.86	Reclamation NE-23-25-1-5 AB	ESAR
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ESA ID: 2624469
ESRD File: 00108527
File Classification: REC
Name: Reclamation

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<hr/>					
10tm Point Coordinate: LLD: LINC: Map Link: ESAR Link:		67091,5665025	5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW		
Document Detail					
Doc Desc: Doc Date:		Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M 6/14/1982			
Document Detail					
Doc Desc: Doc Date:		Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M 9/14/1982			
<hr/>					
12	6 of 8	W/97.4	1,063.0 / -16.86	Reclamation 8-26-25-1-5 AB	ESAR
ESA ID: 2689695					
ESRD File: 00108527					
File Classification: REC					
Name: Reclamation					
10tm Point Coordinate: 67091,5665025					
LLD: 5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW					
LINC:					
Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2689695					
ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527					
Document Detail					
Doc Desc: Doc Date:		Reclamation Application Documentation - CANPET ET AL CALG CROSS 8-26-25-1 2/23/1978			
Document Detail					
Doc Desc: Doc Date:		Reclamation Certificate Documentation - CANPET ET AL CALG CROSS 8-26-25-1 5/23/1978			
<hr/>					
12	7 of 8	W/97.4	1,063.0 / -16.86	Reclamation 14-23-25-1-5 AB	ESAR
ESA ID: 2662911					
ESRD File: 00139327					
File Classification: REC					
Name: Reclamation					
10tm Point Coordinate: 67091,5665025					
LLD: 5;1;25;23;NW					
LINC:					
Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2662911					
ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00139327					
Document Detail					
Doc Desc: Doc Date:		Reclamation Application Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL, SITE REDUCTION 12/3/1963			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL, SITE REDUCTION			
Doc Date:		3/3/1964			
12	8 of 8	W/97.4	1,063.0 / -16.86	Reclamation NW-23-25-1-5 AB	ESAR
ESA ID:		813082			
ESRD File:		00139327			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		67091,5665025			
LLD:		5;1;25;23;NW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=813082			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00139327			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - A Sand and Gravel Pit, held under Approval No.SG-73-84			
Doc Date:		9/6/1991			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - A Sand and Gravel Pit, held under Approval No.SG-73-84			
Doc Date:		9/6/1991			
13	1 of 4	SSW/104.9	1,081.0 / 1.14	Reclamation 8-23-25-1-5 AB	ESAR
ESA ID:		2662871			
ESRD File:		00296783			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		67954,5664153			
LLD:		5;1;25;23;SE;8			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2662871			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00296783			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - CANPET SARCEE CALG CROSS 8-23-25-1 WELL,(SITE REDUCTON)			
Doc Date:		12/3/1963			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 8-23-25-1 WELL,(SITE REDUCTON)			
Doc Date:		3/3/1964			
13	2 of 4	SSW/104.9	1,081.0 / 1.14	Reclamation 8-23-25-1-5 AB	ESAR
ESA ID:		5700841			
ESRD File:		00296783			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
File Classification: REC					
Name: Reclamation					
10tm Point Coordinate: 67954,5664153					
LLD: 5;1;25;23;SE;8					
LINC:					
Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=5700841					
ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00296783					
<u>Document Detail</u>					
Doc Desc: Reclamation Application Documentation - PIONEER CANADA CROSSFIELD 8-23-25-1 WELL-PART 2					
Doc Date: 8/30/2011					
<u>Document Detail</u>					
Doc Desc: Reclamation Application Documentation - PIONEER CANADA CROSSFIELD 8-23-25-1 WELL-PART 1					
Doc Date: 8/30/2011					
<u>Document Detail</u>					
Doc Desc: Reclamation Certificate Documentation - PIONEER CANADA CROSSFIELD 8-23-25-1 WELL					
Doc Date: 2/28/2012					
13	3 of 4	SSW/104.9	1,081.0 / 1.14	Reclamation 8-23-25-1-5 AB	ESAR
ESA ID: 2662871					
ESRD File: 00114262					
File Classification: REC					
Name: Reclamation					
10tm Point Coordinate: 67954,5664153					
LLD: 5;1;25;23;SE;8					
LINC:					
Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=2662871					
ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00114262					
<u>Document Detail</u>					
Doc Desc: Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 8-23-25-1 WELL,(SITE REDUCTON)					
Doc Date: 3/3/1964					
<u>Document Detail</u>					
Doc Desc: Reclamation Application Documentation - CANPET SARCEE CALG CROSS 8-23-25-1 WELL,(SITE REDUCTON)					
Doc Date: 12/3/1963					
13	4 of 4	SSW/104.9	1,081.0 / 1.14	Reclamation 8-23-25-1-5 AB	ESAR
ESA ID: 5700841					
ESRD File: 00114262					
File Classification: REC					
Name: Reclamation					
10tm Point Coordinate: 67954,5664153					
LLD: 5;1;25;23;SE;8					
LINC:					
Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=5700841					
ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00114262					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - PIONEER CANADA CROSSFIELD 8-23-25-1 WELL-PART 1			
Doc Date:		8/30/2011			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - PIONEER CANADA CROSSFIELD 8-23-25-1 WELL			
Doc Date:		2/28/2012			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - PIONEER CANADA CROSSFIELD 8-23-25-1 WELL-PART 2			
Doc Date:		8/30/2011			

14	1 of 4	SSW/115.7	1,082.0 / 2.14	PIONEER CANADA CROSSFIELD 8-23-25-1	AERW
AB					
Well ID:	00/08-23-025-01W5/0	Agent:			
Well Status:	0102000000	Operator:			
Keylist:	0255012308000	Field:	0267		
License No:	0022219	Pool:	0176001		
Licence Status:	Issued	OS Area:			
Licence Date:	1962-03-06	OS Dep:	0000000		
Stat Date:	2011-01-05	Max Tvd:	0		
Well Fluid:	CR-OIL	Ground Elevation:	1079		
Well Mode:	ABD	Surf Loc:			
Well Type:	N/A	EDCT:			
Well Structure:	N/A	Rating Ev:			
Scheme Type:	Conventional ER	Op Surv Prov:			
Scheme Subt:	Waterflood	FD Date:	1962-04-14		
Bttm/Surface Hole:	Bottom Holes	Total Dep:	1783.1		
Fluid Short Desc:	CRUDE OIL	KBE:	1083		
Mode Short Desc:	ABANDONED	Latitude:	51.145166		
Type Short Desc:	Not Applicable	Longitude:	-114.027944		
Update:					
Structure Short Description:	Not Applicable				
Licensee:	Bonavista Energy Corporation				

14	2 of 4	SSW/115.7	1,082.0 / 2.14	Bonavista Energy Corporation(A5RX)	AERW
AB					
Well ID:		Agent:			
Well Status:		Operator:			
Keylist:		Field:			
License No:	0022219	Pool:			
Licence Status:	RecCertified	OS Area:			
Licence Date:	28 Mar 2012	OS Dep:			
Stat Date:		Max Tvd:			
Well Fluid:		Ground Elevation:	1079		
Well Mode:		Surf Loc:	08-23-025-01W5		
Well Type:		EDCT:	BWL		
Well Structure:		Rating Ev:	J		
Scheme Type:		Op Surv Prov:			
Scheme Subt:		FD Date:			
Bttm/Surface Hole:	Surface Holes	Total Dep:			
Fluid Short Desc:		KBE:	1083		
Mode Short Desc:		Latitude:	51.145166		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Type Short Desc: Update: Structure Short Description: Licensee:				Longitude:	-114.027944
14	3 of 4	SSW/115.7	1,082.0 / 2.14	Bonavista Energy Corporation AB	FAC
Facility ID:	ABBT2670014	LE:			
Facility Name:	Northstar Crossfield 08-23	LSD:	8		
License No:	W 0022219	Section:	23		
Licensee Code:	A5RX	Township:	25		
Operational Status:	Suspended	Range:	1		
Operator Code:	A5RX	Meridian:	W5		
Sub Type Code:	311	EDCT Code:			
Sub Type:	Crude Oil Single-Well Battery	EDCT Short Desc.:			
EDCT Description:					
<u>Facility List Shapefile Details</u>					
Lic BA ID:	A5RX	Licensee:	Bonavista Energy Corporation		
Lic Type:	W	EDCT Type:			
Fac Name:	Northstar Crossfield 08-23	EDCT Desc:			
Fac Status:	Suspended	Loc Source:	Well Licence		
14	4 of 4	SSW/115.7	1,082.0 / 2.14	Northstar Crossfield 08-23 8-23-25-1-W5 AB	OGF
Facility ID:	ABBT2670014				
License No:	W 0022219				
LE:					
Location Latitude:	51.1451660000001				
Location Longitude:	-114.027944				
<u>New/Active Reporting Facilities List</u>					
EDCT Code:					
EDCT Description:					
Licensee Code:	A5RX				
Operational Status:	Suspended				
Operator Code:	A5RX				
Operator Name:	Bonavista Energy Corporation				
Sub Type:	Crude Oil Single-Well Battery				
Sub Type Code:	311				
<u>Facility List Shapefile</u>					
Fac Status:	Suspended	Sub Code:	311		
OP BA ID:	A5RX	Fac Sub TY:	Crude Oil Single-Well Battery		
Lic BA ID:	A5RX	EDCT Type:			
Lic Type:	W	EDCT Descr:			
Licensee:	Bonavista Energy Corporation	Loc Source:	Well Licence		
Operator:	Bonavista Energy Corporation				
15	1 of 1	NNE/122.4	1,085.0 / 5.14	AB	WWIS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Well ID:	408700			Elevation Source:	Estimated
Driller ID:	14405			Method of Drilling:	
Licence No:				GPS Obtained:	Map
GIC Well ID:	408700			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):	3575			Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	Yes
Block:				Submitted?:	Yes
Plan:				Location Locked?:	Yes
Type of Work:				Longitude:	-114.021957
Flowing Well:				Latitude:	51.156223
Date Started:				LSD:	4
Water Req Per Day:				Section:	25
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5
Drilling Company:				DLS Coordinates:	4-25-25-1-5
Owner Mailing Address:					
Driller Mailing Address:					

Chemical Analysis

Chem Analysis ID: 2081866
Well Report ID: 408700
Sample No: 71D143
Sample Date: 6/22/1971 0:00:00
Analysis Date: 7/14/1971 0:00:00
Laboratory: AE
Water Level: 50
Aquifer:
Remarks:

Analysis Items

Chemical Analysis ID: 2081866
Element Name: total Kjeldahl nitrogen
Element Symbol: TKN
Decimal Places: 4
Value: 0

Analysis Items

Chemical Analysis ID: 2081866
Element Name: Magnesium
Element Symbol: MG
Decimal Places: 4
Value: 3.002304

Analysis Items

Chemical Analysis ID: 2081866
Element Name: Electrical Conductivity
Element Symbol: EC
Decimal Places: 0
Value: 1025

Analysis Items

Chemical Analysis ID: 2081866

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Element Name:		Calcium			
Element Symbol:		CA			
Decimal Places:		4			
Value:		3.999984			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		Total Alkalinity			
Element Symbol:		TA			
Decimal Places:		4			
Value:		485			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		Hydroxide			
Element Symbol:		OH			
Decimal Places:		4			
Value:		0			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		Total Phosphorus			
Element Symbol:		TP			
Decimal Places:		4			
Value:		0			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		Total Hardness			
Element Symbol:		TH			
Decimal Places:		4			
Value:		20			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		Total Dissolved Solids			
Element Symbol:		TDS			
Decimal Places:		0			
Value:		920			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		pH			
Element Symbol:		PH			
Decimal Places:		2			
Value:		8.6			
<u>Analysis Items</u>					
Chemical Analysis ID:		2081866			
Element Name:		Nitrate			
Element Symbol:		NO3			
Decimal Places:		4			
Value:		0.0994			

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<u>Chemical Analysis</u>					
Chem Analysis ID:		2084100			
Well Report ID:		408700			
Sample No:		71D143			
Sample Date:		6/22/1971 0:00:00			
Analysis Date:		7/14/1971 0:00:00			
Laboratory:		AE			
Water Level:		50			
Aquifer:					
Remarks:					
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Total Alkalinity			
Element Symbol:		TA			
Decimal Places:		4			
Value:		485			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		total Kjeldahl nitrogen			
Element Symbol:		TKN			
Decimal Places:		4			
Value:		0			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Electrical Conductivity			
Element Symbol:		EC			
Decimal Places:		0			
Value:		1025			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Total Dissolved Solids			
Element Symbol:		TDS			
Decimal Places:		0			
Value:		920			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Total Phosphorus			
Element Symbol:		TP			
Decimal Places:		4			
Value:		0			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Magnesium			
Element Symbol:		MG			
Decimal Places:		4			
Value:		3.002304			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Calcium			
Element Symbol:		CA			
Decimal Places:		4			
Value:		3.999984			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Hydroxide			
Element Symbol:		OH			
Decimal Places:		4			
Value:		0			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Total Hardness			
Element Symbol:		TH			
Decimal Places:		4			
Value:		20			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Nitrate			
Element Symbol:		NO3			
Decimal Places:		4			
Value:		0.0994			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		pH			
Element Symbol:		PH			
Decimal Places:		2			
Value:		8.6			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Chloride			
Element Symbol:		CL			
Decimal Places:		4			
Value:		6.01015			
<u>Analysis Items</u>					
Chemical Analysis ID:		2084100			
Element Name:		Sulphate			
Element Symbol:		SO4			
Decimal Places:		4			
Value:		230.33647			

Well Reports

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Well Report ID:	408700			Annular Seal Mat:	Driven
Well Owner ID:	10687190			Annular Seal from:	74
Driller ID:	2533726			Annular Seal to:	75
Drill Company ID:	14405			Annular Seal Amt:	
Drill Instance ID:	8337238			Annular Seal Units:	
Drill Comp Well ID:				Drilling Method:	Rotary
Existing Well ID:				Drilling Start Dt:	
Date Received:				Drilling End Dt:	3/1/1971 0:00:00
Type of Work:	New Well			Pack Type:	
Plug Date:				Pack Grain Size:	
Plug Material Type:				Pack Amount:	
Plug Mat Amount:				Pack Units:	
Plugged Units:				Loc Verify Method:	Map
Well Use:	Stock			Dist Casing Ground:	
Other Well Use:				Artesian Flow?:	No
Total Depth Drill:	150			Artesian Flow Rate:	
Finish Well Depth:				Gas Depth:	
Casing Material:	Steel			Encounter Gas?:	No
Casing OD:	4.56			Flow Ctrl Install?:	No
Casing Thickness:	0			Recommended Rate:	0
Casing Bottom:	150			Recom Intake Depth:	0
Liner Material:				Pump Installed?:	No
Liner OD:	0			Pump Install Depth:	
Liner Thickness:	0			Pump Model:	
Liner Top:	0			Pump Horsepower:	
Liner Bottom:	0			Well Disinfected?:	No
Perforation by:				Other Log:	
Screen Material:				Divert Water Src:	
Screen Size OD:	0			Divert Water Amt:	
Screen Attachment:				Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:	No				
Saline Water Depth:					
Potability Sample Taken?:	No				
Potable Sample Sent to AENV?:	No				
Approval Holder Sign Date:					
Drilling Report Given to Owner:	No				
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:					
Submitted by:					
Additional Comments:					

Well Owners

Well Owner ID: 10687190
Owner Name: BLAIR, GORDON
PO Box:
Address: BALZAC
City:
Postal Code:
Province:
Country:

Drillers

Driller ID: 2533726
Last Name: DRILLER
Middle Initial: NA
First Name: UNKNOWN
Journeyman No: 1

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Is Active?:		Yes			
<u>Drilling Companies</u>					
Starting Well ID:					
Ending Well ID:					
Last Well ID Used:					
Company Name:		ANDERSON C G			
Street Address:					
City:					
Province:					
Country:					
Postal Code:					
E-Mail:					
Is Active?:		No			
<u>Geophysical Logs</u>					
Geophysical Log ID:		5515827			
Log Type:		Electric			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Geophysical Logs</u>					
Geophysical Log ID:		5918902			
Log Type:		Gamma			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Boreholes</u>					
Borehole ID:		618035			
Diameter:		0			
From:		0			
To:		150			
<u>Lithologies</u>					
Depth:		18			
Water Bearing:		No			
Colour:					
Description:					
Material:		Clay & Boulders			
<u>Lithologies</u>					
Depth:		111			
Water Bearing:		No			
Colour:					
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		116			
Water Bearing:		No			
Colour:					
Description:					
Material:		Shale			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Lithologies</u>					
Depth:			150		
Water Bearing:			No		
Colour:					
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			128		
Water Bearing:			No		
Colour:					
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			139		
Water Bearing:			No		
Colour:					
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			48		
Water Bearing:			No		
Colour:					
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			72		
Water Bearing:			No		
Colour:					
Description:			Soft		
Material:			Sand & Sandstone		
<u>Lithologies</u>					
Depth:			88		
Water Bearing:			No		
Colour:					
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			90		
Water Bearing:			No		
Colour:					
Description:					
Material:			Sandstone		
<u>Lithologies</u>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Depth:		140			
Water Bearing:		No			
Colour:					
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		32			
Water Bearing:		No			
Colour:					
Description:		Sandy			
Material:		Clay & Sandstone			
<u>Lithologies</u>					
Depth:		130			
Water Bearing:		No			
Colour:					
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		119			
Water Bearing:		No			
Colour:					
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		50			
Water Bearing:		No			
Colour:					
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		110			
Water Bearing:		No			
Colour:					
Description:					
Material:		Shale			
<u>Pump Tests</u>					
Pump Test ID:		10349549			
Test Date:		3/1/1971 0:00:00			
Start Time:		1/12/1900 0:00:00			
Taken from Top of Casing:		No			
Static Water Level:		14			
End Water Level:		90			
Water Removal Type:		Bailer			
Water Removal Rate:		8			
Removal Depth from:		0			
Reason for Short Test:					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
16	1 of 1	SSW/123.8	1,081.0 / 1.14	A R I FINANCIAL SERVICES #31 112 FREEPORT CR NE AB	CBL

Comdistnm: STONEY 2
Latitude: 51.1446536859592
Longitude: -114.027442947642
Location: (51.1446536859592, -114.027442947642)

City Quadrants: 4
Ward Boundaries: 11
Calgary Communities: 13

Licence Type Information

Licence Types: MOTOR VEHICLE DEALER - PREMISES
Job Status: RENEWAL LICENSED
Job Created Date: 2016/03/03

17	1 of 4	WSW/128.3	1,062.6 / -17.22	Reclamation 8-26-25-1-5 AB	ESAR
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ESA ID: 2689695
ESRD File: 00108527
File Classification: REC
Name: Reclamation
10tm Point Coordinate: 67644,5665005
LLD: 5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2689695>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527>

Document Detail

Doc Desc: Reclamation Application Documentation - CANPET ET AL CALG CROSS 8-26-25-1
Doc Date: 2/23/1978

Document Detail

Doc Desc: Reclamation Certificate Documentation - CANPET ET AL CALG CROSS 8-26-25-1
Doc Date: 5/23/1978

17	2 of 4	WSW/128.3	1,062.6 / -17.22	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE AB	ESAR
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ESA ID: 8058562
ESRD File: SCD02333
File Classification: SCD
Name: ALBERTA TRANSPORTATION FORMER DRYWASTE SITE
10tm Point Coordinate: 67644,5665005
LLD: 5;1;25;23;NE 7598JK;
LINC: 0035522219 0035522219 0025893330 0035522219 0032569478
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=8058562>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333>

Document Detail

Doc Desc: Various Correspondence for Dry Waste Site For Alberta Transportation.pdf
Doc Date: 8/4/1992

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
17	3 of 4	WSW/128.3	1,062.6 / -17.22	Reclamation NE-23-25-1-5 AB	ESAR

ESA ID: 2624469
ESRD File: 00108527
File Classification: REC
Name: Reclamation
10tm Point Coordinate: 67644,5665005
LLD: 5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527>

Document Detail

Doc Desc: Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 6/14/1982

Document Detail

Doc Desc: Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 9/14/1982

17	4 of 4	WSW/128.3	1,062.6 / -17.22	Reclamation NE-23-25-1-5 AB	ESAR
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ESA ID: 2624469
ESRD File: SCD02333
File Classification: SCD
Name: Reclamation
10tm Point Coordinate: 67644,5665005
LLD: 5;1;25;23;NE 7598JK;
LINC: 0035522219 0035522219 0025893330 0035522219 0032569478
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333>

Document Detail

Doc Desc: Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 6/14/1982

Document Detail

Doc Desc: Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 9/14/1982

18	1 of 1	WNW/136.3	1,080.0 / 0.14	AB	WWIS
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Well ID: 408701
Driller ID: 24483
Licence No:
GIC Well ID: 408701
GOA Well Tag No:
Elevation (ft): 3525
Depth (ft):
Date Completed:
Proposed Use:
Lot:

Elevation Source: Estimated
Method of Drilling:
GPS Obtained: Not Verified
Boundary From:
Distance North:
Distance South:
Distance East:
Distance West:
Additional Desc:
Validated?: Yes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Block:				Submitted?:	Yes
Plan:				Location Locked?:	Yes
Type of Work:				Longitude:	-114.027944
Flowing Well:				Latitude:	51.156177
Date Started:				LSD:	1
Water Req Per Day:				Section:	26
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5
Drilling Company:				DLS Coordinates:	1-26-25-1-5
Owner Mailing Address:					
Driller Mailing Address:					

Well Reports

Well Report ID:	408701	Annular Seal Mat:	Drive Shoe
Well Owner ID:	10687191	Annular Seal from:	0
Driller ID:	2533726	Annular Seal to:	82
Drill Company ID:	24483	Annular Seal Amt:	
Drill Instance ID:	8335462	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Cable Tool
Existing Well ID:		Drilling Start Dt:	8/20/1975 0:00:00
Date Received:	12/10/1975 0:00:00	Drilling End Dt:	9/12/1975 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	Not Verified
Well Use:	Domestic & Stock	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	245	Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	7	Flow Ctrl Install?:	No
Casing Thickness:	0.231	Recommended Rate:	
Casing Bottom:	82	Recom Intake Depth:	
Liner Material:	Steel	Pump Installed?:	No
Liner OD:	5.56	Pump Install Depth:	
Liner Thickness:	0	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	245	Well Disinfected?:	No
Perforation by:	Torch	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:	0	Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:			
Drilling Report Given to Owner:	No		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:			
Submitted by:			
Additional Comments:	WATER AT 180'		

Well Owners

Well Owner ID: 10687191

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
Owner Name:		BAR OW RANCH #OFFICE WELL			
PO Box:					
Address:		1102 EDMONTON TRAIL, CALGARY			
City:					
Postal Code:					
Province:					
Country:					
 <u>Drillers</u>					
Driller ID:		2533726			
Last Name:		DRILLER			
Middle Initial:		NA			
First Name:		UNKNOWN			
Journeyman No:		1			
Is Active?:		Yes			
 <u>Drilling Companies</u>					
Starting Well ID:					
Ending Well ID:					
Last Well ID Used:					
Company Name:		PARSONS DRILLING			
Street Address:					
City:					
Province:					
Country:					
Postal Code:					
E-Mail:					
Is Active?:		No			
 <u>Perforations</u>					
Perforation ID:		4189417			
From:		160			
To:		242			
Diameter:		0.375			
Interval:		8			
 <u>Geophysical Logs</u>					
Geophysical Log ID:		5515829			
Log Type:		Electric			
Log Taken?:		No			
Sent to AENV?:		No			
 <u>Geophysical Logs</u>					
Geophysical Log ID:		5918904			
Log Type:		Gamma			
Log Taken?:		No			
Sent to AENV?:		No			
 <u>Boreholes</u>					
Borehole ID:		618037			
Diameter:		0			
From:		0			
To:		245			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Lithologies</u>					
Depth:		38			
Water Bearing:		No			
Colour:		Brown			
Description:					
Material:		Clay & Boulders			
<u>Lithologies</u>					
Depth:		245			
Water Bearing:		No			
Colour:		Gray			
Description:		Firm			
Material:		Shale			
<u>Lithologies</u>					
Depth:		43			
Water Bearing:		No			
Colour:					
Description:					
Material:		Boulders			
<u>Lithologies</u>					
Depth:		55			
Water Bearing:		No			
Colour:		Brown			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		83			
Water Bearing:		No			
Colour:		Brown			
Description:		Silty			
Material:		Clay			
<u>19</u>	1 of 3	SSW/137.8	1,079.7 / -0.18	AB	WWIS
Well ID:	12011600			Elevation Source:	Not Obtained
Driller ID:	24041			Method of Drilling:	
Licence No:				GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022279			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):				Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	No
Block:				Submitted?:	No
Plan:				Location Locked?:	No
Type of Work:				Longitude:	-114.02442
Flowing Well:				Latitude:	51.15269
Date Started:				LSD:	13
Water Req Per Day:				Section:	24
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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Drilling Company:
Owner Mailing Address:
Driller Mailing Address:

DLS Coordinates: 13-24-25-1-5

Well Reports

Well Report ID:	12012724	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12012930	Annular Seal from:	
Driller ID:	12000012	Annular Seal to:	
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	1	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	17	Artesian Flow Rate:	
Finish Well Depth:	17	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	2	Pump Install Depth:	
Liner Thickness:	0.209	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	17	Well Disinfected?:	Yes
Perforation by:	Machine	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:		Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	11/6/2012 0:00:00		
Drilling Report Given to Owner:	Yes		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:	{9643AF3C-582C-4B03-870D-F553D107F23D}		
Submitted by:	{9643AF3C-582C-4B03-870D-F553D107F23D}		
Additional Comments:			

Well Owners

Well Owner ID: 12012930
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Drillers</u>					
Driller ID:		12000012			
Last Name:		QUINLAN			
Middle Initial:					
First Name:		CHRIS			
Journeyman No:		48135A			
Is Active?:		Yes			
<u>Drilling Companies</u>					
Starting Well ID:		1020000			
Ending Well ID:		1024999			
Last Well ID Used:		1023090			
Company Name:		AARON DRILLING INC.			
Street Address:		242222 2nd Street East			
City:		Foothills			
Province:		ALBERTA			
Country:		CANADA			
Postal Code:		T1S 3K9			
E-Mail:		admin@aarondrilling.com			
Is Active?:		Yes			
<u>Perforations</u>					
Perforation ID:		4274892			
From:		12			
To:		17			
Diameter:		0.02			
Interval:		0.25			
19	2 of 3	SSW/137.8	1,079.7 / -0.18	AB	WWIS
Well ID:	12011831			Elevation Source:	Not Obtained
Driller ID:	24041			Method of Drilling:	
Licence No:				GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022281			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):				Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	No
Block:				Submitted?:	No
Plan:				Location Locked?:	No
Type of Work:				Longitude:	-114.024421
Flowing Well:				Latitude:	51.152693
Date Started:				LSD:	13
Water Req Per Day:				Section:	24
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5
Drilling Company:				DLS Coordinates:	13-24-25-1-5
Owner Mailing Address:					
Driller Mailing Address:					
<u>Well Reports</u>					
Well Report ID:	12012985			Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12013191			Annular Seal from:	0
Driller ID:	12000012			Annular Seal to:	54

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Drill Company ID:	24041			Annular Seal Amt:	
Drill Instance ID:				Annular Seal Units:	
Drill Comp Well ID:				Drilling Method:	Rotary - Air
Existing Well ID:				Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00			Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned			Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00			Pack Grain Size:	
Plug Material Type:	Bentonite Chips			Pack Amount:	
Plug Mat Amount:	8			Pack Units:	
Plugged Units:	Bags			Loc Verify Method:	
Well Use:	Monitoring			Dist Casing Ground:	
Other Well Use:				Artesian Flow?:	No
Total Depth Drill:	65			Artesian Flow Rate:	
Finish Well Depth:	64			Gas Depth:	
Casing Material:	Steel			Encounter Gas?:	No
Casing OD:	4			Flow Ctrl Install?:	No
Casing Thickness:	0.188			Recommended Rate:	
Casing Bottom:	2			Recom Intake Depth:	
Liner Material:	Plastic			Pump Installed?:	No
Liner OD:	2			Pump Install Depth:	
Liner Thickness:	0.209			Pump Model:	
Liner Top:	0			Pump Horsepower:	
Liner Bottom:	6			Well Disinfected?:	Yes
Perforation by:				Other Log:	
Screen Material:	Plastic			Divert Water Src:	
Screen Size OD:	2			Divert Water Amt:	
Screen Attachment:	Attached To Riser			Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:	No				
Saline Water Depth:					
Potability Sample Taken?:	No				
Potable Sample Sent to AENV?:	No				
Approval Holder Sign Date:	11/6/2012 0:00:00				
Drilling Report Given to Owner:	Yes				
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:	{9643AF3C-582C-4B03-870D-F553D107F23D}				
Submitted by:	{9643AF3C-582C-4B03-870D-F553D107F23D}				
Additional Comments:					

Well Owners

Well Owner ID: 12013191
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

Drillers

Driller ID: 12000012
Last Name: QUINLAN
Middle Initial:
First Name: CHRIS
Journeyman No: 48135A
Is Active?: Yes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Drilling Companies</u>					
Starting Well ID:		1020000			
Ending Well ID:		1024999			
Last Well ID Used:		1023090			
Company Name:		AARON DRILLING INC.			
Street Address:		242222 2nd Street East			
City:		Foothills			
Province:		ALBERTA			
Country:		CANADA			
Postal Code:		T1S 3K9			
E-Mail:		admin@aarondrilling.com			
Is Active?:		Yes			
<u>Boreholes</u>					
Borehole ID:		810101			
Diameter:		6.125			
From:		0			
To:		65			
<u>Screen Type</u>					
Screen ID:		1120234			
From:		55			
To:		65			
Slot Size:		0.02			
<u>Pump Tests</u>					
Pump Test ID:		16010206			
Test Date:					
Start Time:		1/1/1980 11:00:00			
Taken from Top of Casing:		No			
Static Water Level:		9			
End Water Level:					
Water Removal Type:					
Water Removal Rate:					
Removal Depth from:					
Reason for Short Test:					
<u>19</u>	3 of 3	SSW/137.8	1,079.7 / -0.18	AB	WWIS
Well ID:	12011830			Elevation Source:	Not Obtained
Driller ID:	24041			Method of Drilling:	
Licence No:				GPS Obtained:	Hand held autonomous GPS 20-30m
GIC Well ID:	1022280			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):				Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	No
Block:				Submitted?:	No
Plan:				Location Locked?:	No
Type of Work:				Longitude:	-114.02442
Flowing Well:				Latitude:	51.15269
Date Started:				LSD:	13
Water Req Per Day:				Section:	24
Gas Present:				Township:	25
Oil Present:				Range:	1

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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Flow Rate:
Drilling Company:
Owner Mailing Address:
Driller Mailing Address:

Meridian: 5
DLS Coordinates: 13-24-25-1-5

Well Reports

Well Report ID:	12012984	Annular Seal Mat:	Bentonite Chips/Tablets
Well Owner ID:	12013190	Annular Seal from:	0
Driller ID:	12000012	Annular Seal to:	8
Drill Company ID:	24041	Annular Seal Amt:	
Drill Instance ID:		Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Rotary - Air
Existing Well ID:		Drilling Start Dt:	9/26/2012 0:00:00
Date Received:	11/6/2012 0:00:00	Drilling End Dt:	9/26/2012 0:00:00
Type of Work:	Existing Well-Decommissioned	Pack Type:	Gravel
Plug Date:	9/26/2012 0:00:00	Pack Grain Size:	
Plug Material Type:	Bentonite Chips	Pack Amount:	
Plug Mat Amount:	3.5	Pack Units:	
Plugged Units:	Bags	Loc Verify Method:	
Well Use:	Monitoring	Dist Casing Ground:	24
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	20	Artesian Flow Rate:	
Finish Well Depth:	14	Gas Depth:	
Casing Material:	Steel	Encounter Gas?:	No
Casing OD:	4	Flow Ctrl Install?:	No
Casing Thickness:	0.188	Recommended Rate:	
Casing Bottom:	2	Recom Intake Depth:	
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	2	Pump Install Depth:	
Liner Thickness:	0.209	Pump Model:	
Liner Top:	0	Pump Horsepower:	
Liner Bottom:	14	Well Disinfected?:	Yes
Perforation by:	Machine	Other Log:	
Screen Material:	Plastic	Divert Water Src:	
Screen Size OD:	2	Divert Water Amt:	
Screen Attachment:	Attached To Riser	Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	11/6/2012 0:00:00		
Drilling Report Given to Owner:	Yes		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:	{9643AF3C-582C-4B03-870D-F553D107F23D}		
Submitted by:	{9643AF3C-582C-4B03-870D-F553D107F23D}		
Additional Comments:			

Well Owners

Well Owner ID: 12013190
Owner Name: BORGER EARTHWORKS
PO Box:
Address: 7719-40 ST. S.E.
City: CALGARY
Postal Code: T2C 2G9
Province: ALBERTA
Country: CANADA

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<u>Drillers</u>					
Driller ID:		12000012			
Last Name:		QUINLAN			
Middle Initial:					
First Name:		CHRIS			
Journeyman No:		48135A			
Is Active?:		Yes			
<u>Drilling Companies</u>					
Starting Well ID:		1020000			
Ending Well ID:		1024999			
Last Well ID Used:		1023090			
Company Name:		AARON DRILLING INC.			
Street Address:		242222 2nd Street East			
City:		Foothills			
Province:		ALBERTA			
Country:		CANADA			
Postal Code:		T1S 3K9			
E-Mail:		admin@aarondrilling.com			
Is Active?:		Yes			
<u>Perforations</u>					
Perforation ID:		4274973			
From:		9			
To:		14			
Diameter:		0.02			
Interval:		0.25			
<u>Boreholes</u>					
Borehole ID:		810100			
Diameter:		6.125			
From:		0			
To:		14			
<u>Screen Type</u>					
Screen ID:		1120233			
From:		9			
To:		14			
Slot Size:		0.02			
<u>Pump Tests</u>					
Pump Test ID:		16010205			
Test Date:					
Start Time:		1/1/1980 11:00:00			
Taken from Top of Casing:		No			
Static Water Level:		7			
End Water Level:					
Water Removal Type:					
Water Removal Rate:					
Removal Depth from:					
Reason for Short Test:					
20	1 of 1	ENE/141.5	1,090.0 / 10.14	COUNTRY HILLS VOLKSWAGEN 11380 STONEHILL DR NE	CBL

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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AB

Comdistnm: STONEGATE LANDING
Latitude: 51.156107270065
Longitude: -114.005556028438
Location: (51.156107270065, -114.005556028438)

City Quadrants: 4
Ward Boundaries: 11
Calgary Communities: 6

Licence Type Information

Licence Types: MOTOR VEHICLE DEALER - PREMISES
Job Status: PENDING RENEWAL
Job Created Date: 2018/04/04

Licence Type Information

Licence Types: MOTOR VEHICLE REPAIR AND SERVICE (1)
Job Status: PENDING RENEWAL
Job Created Date: 2018/04/04

21	1 of 2	W/153.2	1,059.9 / -19.95	DEML CROSS 14-23-25-1	AERW
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AB

Well ID: F1/14-23-025-01W5/0 Well Status: 0002000000 Keylist: 0255012314F10 License No: 0038439 Licence Status: Issued Licence Date: 1970-07-17 Stat Date: 1970-11-05 Well Fluid: N/A Well Mode: ABD Well Type: N/A Well Structure: N/A Scheme Type: Scheme Subt: Bttm/Surface Hole: Bottom Holes Fluid Short Desc: Not Applicable Mode Short Desc: ABANDONED Type Short Desc: Not Applicable Update: Structure Short Description: Not Applicable Licensee: Direct Energy Marketing Limited	Agent: Operator: Field: 0267 Pool: 0000000 OS Area: OS Dep: 0000000 Max Tvd: 0 Ground Elevation: 1059.6 Surf Loc: EDCT: Rating Ev: Op Surv Prov: FD Date: 1970-07-28 Total Dep: 228.6 KBE: 1059.6 Latitude: 51.152647 Longitude: -114.038584
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21	2 of 2	W/153.2	1,059.9 / -19.95	Direct Energy Marketing Limited(ORC3)	AERW
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AB

Well ID: Well Status: Keylist: License No: 0038439 Licence Status: RecCertified Licence Date: 28 Nov 2012 Stat Date: Well Fluid: Well Mode: Well Type: Well Structure: Scheme Type: Scheme Subt:	Agent: Operator: Field: Pool: OS Area: OS Dep: Max Tvd: Ground Elevation: 1059.6 Surf Loc: 14-23-025-01W5 EDCT: BWL Rating Ev: J Op Surv Prov: FD Date:
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Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Bttm/Surface Hole: Fluid Short Desc: Mode Short Desc: Type Short Desc: Update: Structure Short Description: Licensee:	Surface Holes			Total Dep: KBE: 1059.6 Latitude: 51.152647 Longitude: -114.038584	

22	1 of 4	W/166.6	1,060.9 / -18.94	Reclamation 14-23-25-1-5 AB	ESAR
ESA ID:	2662911				
ESRD File:	00105455				
File Classification:	REC				
Name:	Reclamation				
10tm Point Coordinate:	67150,5664957				
LLD:	5;1;25;23;NW;14				
LINC:					
Map Link:	http://www.esar.alberta.ca/esarmap.aspx?esaid=2662911				
ESAR Link:	http://www.esar.alberta.ca/esarmain.aspx?esaid=00105455				
<u>Document Detail</u>					
Doc Desc:	Reclamation Application Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL, SITE REDUCTION				
Doc Date:	12/3/1963				
<u>Document Detail</u>					
Doc Desc:	Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL, SITE REDUCTION				
Doc Date:	3/3/1964				

22	2 of 4	W/166.6	1,060.9 / -18.94	Reclamation 14-23-25-1-5 AB	ESAR
ESA ID:	2662911				
ESRD File:	00114272				
File Classification:	REC				
Name:	Reclamation				
10tm Point Coordinate:	67150,5664957				
LLD:	5;1;25;23;NW;14				
LINC:					
Map Link:	http://www.esar.alberta.ca/esarmap.aspx?esaid=2662911				
ESAR Link:	http://www.esar.alberta.ca/esarmain.aspx?esaid=00114272				
<u>Document Detail</u>					
Doc Desc:	Reclamation Application Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL, SITE REDUCTION				
Doc Date:	12/3/1963				
<u>Document Detail</u>					
Doc Desc:	Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL, SITE REDUCTION				
Doc Date:	3/3/1964				

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
22	3 of 4	W/166.6	1,060.9 / -18.94	Reclamation 14-23-25-1-5 AB	ESAR
ESA ID:		2574796			
ESRD File:		00114272			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		67150,5664957			
LLD:		5;1;25;23;NW;14			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2574796			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00114272			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL			
Doc Date:		5/29/1979			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL			
Doc Date:		2/28/1979			
22	4 of 4	W/166.6	1,060.9 / -18.94	Reclamation 14-23-25-1-5 AB	ESAR
ESA ID:		2574796			
ESRD File:		00105455			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		67150,5664957			
LLD:		5;1;25;23;NW;14			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2574796			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00105455			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL			
Doc Date:		2/28/1979			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - CANPET SARCEE CALG CROSS 14-23-25-1 WELL			
Doc Date:		5/29/1979			
23	1 of 1	SSW/168.5	1,082.0 / 2.14	AB	AOGW
Licence NO:		0022219		ATS Coordinates: 8-23-25-1-5	
Licence Date:		19620306		Structure:	
Mode:		PUMPING		Type:	
Well Status Date:		19660501		Fluid: CRUDE OIL	
Total Depth (m):		1783.10		Licencee: Bonavista Petroleum Ltd.	
Final Drill Date:		19620414			
Well Name:		PIONEER CANADA CROSSFIELD 8-23-25-1			
Licencee Address:		1100, 321 - 6 Avenue SW Calgary, AB T2P 3H3			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
24	1 of 5	E/174.4	1,093.9 / 14.08	AVEDA TRANSPORTATION AND ENERGY SERVICES 2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB T3N 1A6	FST
Site No: 1100 Tank No: 1 No of Tanks: Tank Type: Aboveground Tank Status: Currently in service Site Status: Date Last Used: UST/AST: Contents: Gasoline Other Contents: Capacity: Other - specify in liters Other Capacity: 5,000 litres UST Secondary: AST Secondary: Steel Overfill Prevention: Liquid - Tight Fill Box LLD: Spill Containment: Tank Status by Site Name:		Dt Form Rcvd: 2007/07/24 Date Removed: Removal Reason: Located 200m: NO Located 500m: YES DLS Coord: Lot: Block: 449 Plan: 779GNA Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4: Commercial / Industrial			
24	2 of 5	E/174.4	1,093.9 / 14.08	AVEDA TRANSPORTATION AND ENERGY SERVICES 2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB T3N 1A6	FST
Site No: 1100 Tank No: 2 No of Tanks: Tank Type: Aboveground Tank Status: Currently in service Site Status: Date Last Used: UST/AST: Contents: Diesel Other Contents: Capacity: Other - specify in liters Other Capacity: 20,000 litres UST Secondary: AST Secondary: Steel Overfill Prevention: Liquid - Tight Fill Box LLD: Spill Containment: Tank Status by Site Name:		Dt Form Rcvd: 2007/07/24 Date Removed: Removal Reason: Located 200m: NO Located 500m: YES DLS Coord: Lot: Block: 449 Plan: 779GNA Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4: Commercial / Industrial			
24	3 of 5	E/174.4	1,093.9 / 14.08	AVEDA TRANSPORTATION AND ENERGY SERVICES 2505-COUNTRY HILLS BLVD. NE CALGARY (A) AB	FST
Site No: 1100 Tank No: No of Tanks: Tank Type: Tank Status: Site Status: Date Last Used: UST/AST: Contents: Other Contents:		Dt Form Rcvd: Date Removed: Removal Reason: Located 200m: Located 500m: DLS Coord: Lot: Block: 449 Plan: 779GNA Municipality: CALGARY (A)			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: LLD: Spill Containment: Tank Status by Site Name:				Postal: Facility 1: Facility 2: Facility 3: Facility 4:	
24	4 of 5	E/174.4	1,093.9 / 14.08	Finnie Hauling & Storage Ltd. 2505 Country Hills Blvd NE Calgary AB T3N 1A6	SCT
Established: Plant Size (ft²): Employment:		1959			
--Details--					
Description:		Services to Oil and Gas Extraction			
SIC/NAICS Code:		213118			
Description:		Other Warehousing and Storage			
SIC/NAICS Code:		493190			
24	5 of 5	E/174.4	1,093.9 / 14.08	Phoenix Oilfield Hauling Inc. 2505 Country Hills Blvd NE Calgary AB T3N 1A6	SCT
Established: Plant Size (ft²): Employment:					
--Details--					
Description:		Services to Oil and Gas Extraction			
SIC/NAICS Code:		213118			
25	1 of 2	WSW/177.1	1,081.9 / 2.00	JIFFY LUBE #150 11135 14 ST NE AB	CBL
Comdistnm:		STONEY 1		City Quadrants:	4
Latitude:		51.1527497079022		Ward Boundaries:	11
Longitude:		-114.02940946291		Calgary Communities:	163
Location:		(51.1527497079022, -114.02940946291)			
<u>Licence Type Information</u>					
Licence Types:		MOTOR VEHICLE REPAIR AND SERVICE (1)			
Job Status:		RENEWAL INVOICED			
Job Created Date:		2016/04/29			
25	2 of 2	WSW/177.1	1,081.9 / 2.00	JIFFY LUBE 11135 14 ST NE APT 150 CALGARY AB T3K0Z7	RST
Headcode:		00921430			
Headcode Desc:		OIL CHANGES & LUBRICATION SERVICE			
Phone:		5872300146			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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List Name: INFO-DIRECT(TM) BUSINESS FILE
Description:

[26](#) 1 of 1 SW/177.5 1,079.6 / -0.31 NOVATEL 10921 14 ST NE AB CBL

Comdistnm: STONEY 1 City Quadrants: 4
Latitude: 51.1502063437489 Ward Boundaries: 11
Longitude: -114.030796241847 Calgary Communities: 163
Location: (51.1502063437489, -114.030796241847)

Licence Type Information

Licence Types: MANUFACTURER
Job Status: LICENSED
Job Created Date: 2018/09/14

[27](#) 1 of 1 SE/178.2 1,089.0 / 9.14 AB WWIS

Well ID: 408698	Elevation Source: Not Obtained
Driller ID: 24659	Method of Drilling:
Licence No:	GPS Obtained: Map
GIC Well ID: 408698	Boundary From:
GOA Well Tag No:	Distance North:
Elevation (ft):	Distance South:
Depth (ft):	Distance East:
Date Completed:	Distance West:
Proposed Use:	Additional Desc: WELL # 1
Lot:	Validated?: Yes
Block:	Submitted?: Yes
Plan:	Location Locked?: Yes
Type of Work:	Longitude: -114.01735
Flowing Well:	Latitude: 51.15061
Date Started:	LSD: 11
Water Req Per Day:	Section: 24
Gas Present:	Township: 25
Oil Present:	Range: 1
Flow Rate:	Meridian: 5
Drilling Company:	DLS Coordinates: 11-24-25-1-5
Owner Mailing Address:	
Driller Mailing Address:	

Well Reports

Well Report ID: 408698	Annular Seal Mat: Driven
Well Owner ID: 10687188	Annular Seal from: 0
Driller ID: 2533726	Annular Seal to: 0
Drill Company ID: 24267	Annular Seal Amt:
Drill Instance ID: 8335500	Annular Seal Units:
Drill Comp Well ID:	Drilling Method: Rotary
Existing Well ID:	Drilling Start Dt: 5/12/1983 0:00:00
Date Received: 8/15/1985 0:00:00	Drilling End Dt: 5/15/1983 0:00:00
Type of Work: New Well	Pack Type:
Plug Date:	Pack Grain Size:
Plug Material Type:	Pack Amount:
Plug Mat Amount:	Pack Units:
Plugged Units:	Loc Verify Method: Map
Well Use: Domestic & Stock	Dist Casing Ground:
Other Well Use:	Artesian Flow?: No
Total Depth Drill: 210	Artesian Flow Rate:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Finish Well Depth:				Gas Depth:	
Casing Material:	Steel			Encounter Gas?:	No
Casing OD:	6.63			Flow Ctrl Install?:	No
Casing Thickness:	0.188			Recommended Rate:	0
Casing Bottom:	63			Recom Intake Depth:	0
Liner Material:	Plastic			Pump Installed?:	No
Liner OD:	4.5			Pump Install Depth:	
Liner Thickness:	0.218			Pump Model:	
Liner Top:	0			Pump Horsepower:	
Liner Bottom:	210			Well Disinfected?:	No
Perforation by:	Machine			Other Log:	
Screen Material:				Divert Water Src:	
Screen Size OD:	0			Divert Water Amt:	
Screen Attachment:				Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:	No				
Saline Water Depth:					
Potability Sample Taken?:	No				
Potable Sample Sent to AENV?:	No				
Approval Holder Sign Date:					
Drilling Report Given to Owner:	No				
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:					
Submitted by:					
Additional Comments:					

Well Owners

Well Owner ID: 10687188
Owner Name: BILBEN, BOB
PO Box:
Address: BALZAC
City:
Postal Code:
Province:
Country:

Drillers

Driller ID: 2533726
Last Name: DRILLER
Middle Initial: NA
First Name: UNKNOWN
Journeyman No: 1
Is Active?: Yes

Drilling Companies

Starting Well ID:
Ending Well ID:
Last Well ID Used:
Company Name: SANDO DRILLING LTD.
Street Address:
City:
Province:
Country:
Postal Code:
E-Mail:
Is Active?: No

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<u>Perforations</u>					
<i>Perforation ID:</i>		4189559			
<i>From:</i>		180			
<i>To:</i>		200			
<i>Diameter:</i>		0			
<i>Interval:</i>		0			
<u>Geophysical Logs</u>					
<i>Geophysical Log ID:</i>		5919261			
<i>Log Type:</i>		Gamma			
<i>Log Taken?:</i>		No			
<i>Sent to AENV?:</i>		No			
<u>Geophysical Logs</u>					
<i>Geophysical Log ID:</i>		5516186			
<i>Log Type:</i>		Electric			
<i>Log Taken?:</i>		No			
<i>Sent to AENV?:</i>		No			
<u>Boreholes</u>					
<i>Borehole ID:</i>		618394			
<i>Diameter:</i>		0			
<i>From:</i>		0			
<i>To:</i>		210			
<u>Lithologies</u>					
<i>Depth:</i>		55			
<i>Water Bearing:</i>		No			
<i>Colour:</i>					
<i>Description:</i>					
<i>Material:</i>		Clay			
<u>Lithologies</u>					
<i>Depth:</i>		210			
<i>Water Bearing:</i>		No			
<i>Colour:</i>					
<i>Description:</i>					
<i>Material:</i>		Shale & Sandstone Ledges			
<u>Pump Tests</u>					
<i>Pump Test ID:</i>		10349547			
<i>Test Date:</i>		5/15/1983 0:00:00			
<i>Start Time:</i>		1/12/1900 0:00:00			
<i>Taken from Top of Casing:</i>		No			
<i>Static Water Level:</i>		60			
<i>End Water Level:</i>					
<i>Water Removal Type:</i>		Unknown			
<i>Water Removal Rate:</i>		8			
<i>Removal Depth from:</i>		0			
<i>Reason for Short Test:</i>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Well Reports</u>					
Well Report ID:	12005368			Annular Seal Mat:	
Well Owner ID:	12005420			Annular Seal from:	
Driller ID:	10773525			Annular Seal to:	
Drill Company ID:	24659			Annular Seal Amt:	
Drill Instance ID:				Annular Seal Units:	
Drill Comp Well ID:				Drilling Method:	Unknown
Existing Well ID:				Drilling Start Dt:	
Date Received:	1/25/2011 0:00:00			Drilling End Dt:	
Type of Work:	Existing Well-Decommissioned			Pack Type:	
Plug Date:	9/20/2010 0:00:00			Pack Grain Size:	
Plug Material Type:	Bentonite Chips			Pack Amount:	
Plug Mat Amount:	41			Pack Units:	
Plugged Units:	Bags			Loc Verify Method:	
Well Use:	Unknown			Dist Casing Ground:	
Other Well Use:				Artesian Flow?:	No
Total Depth Drill:	210			Artesian Flow Rate:	
Finish Well Depth:				Gas Depth:	
Casing Material:	Steel			Encounter Gas?:	No
Casing OD:	7			Flow Ctrl Install?:	No
Casing Thickness:				Recommended Rate:	
Casing Bottom:				Recom Intake Depth:	
Liner Material:				Pump Installed?:	No
Liner OD:				Pump Install Depth:	
Liner Thickness:				Pump Model:	
Liner Top:				Pump Horsepower:	
Liner Bottom:				Well Disinfected?:	No
Perforation by:				Other Log:	
Screen Material:				Divert Water Src:	
Screen Size OD:				Divert Water Amt:	
Screen Attachment:				Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:	No				
Saline Water Depth:					
Potability Sample Taken?:	No				
Potable Sample Sent to AENV?:	No				
Approval Holder Sign Date:	9/20/2010 0:00:00				
Drilling Report Given to Owner:	No				
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:	{5C7BF00A-B7C4-44D2-9347-5EE440D7F884}				
Submitted by:	{5C7BF00A-B7C4-44D2-9347-5EE440D7F884}				
Additional Comments:	CASING COULD NOT BE PULLED. REASON FOR PLUGGING THE WELL: NEW DEVELOPMENT FOR INDUSTRIAL. STATIC WATER LEVEL 74', WELL WAS RECLAIMED WITH 41 BAGS ENVIRO GROUT 30% SOLID. MATERIAL WAS PUMPED FROM BOTTOM TO SURFACE BY DRILL PIPE.				

Well Owners

Well Owner ID: 12005420
Owner Name: FLINTSTONE CONTRACTING
PO Box:
Address:
City:
Postal Code:
Province: ALBERTA
Country: CANADA

Drillers

Driller ID: 10773525

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Last Name: Middle Initial: First Name: Journeyman No: Is Active?:		GERRITSEN CHRIS 4385Q Yes			
<u>Drilling Companies</u>					
Starting Well ID: Ending Well ID: Last Well ID Used: Company Name: Street Address: City: Province: Country: Postal Code: E-Mail: Is Active?:		1305000 1309999 1305787 GERRITSEN DRILLING BOX 187 ROCKYFORD ALBERTA CANADA T0J 2R0 drilling@ccewireless.ca Yes			
<u>Lithologies</u>					
Depth: Water Bearing: Colour: Description: Material:		210 No Old Well			
28	1 of 6	SE/179.5	1,087.0 / 7.14	Reclamation NW-24-25-1-5 AB	ESAR
ESA ID: ESRD File: File Classification: Name: 10tm Point Coordinate: LLD: LINC: Map Link: ESAR Link:		2792955 SCD01756 SCD Reclamation 68582,5664739 5;1;25;24;NW 0021032610 http://www.esar.alberta.ca/esarmap.aspx?esaid=2792955 http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD01756			
<u>Document Detail</u>					
Doc Desc: Doc Date:		Reclamation Application Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M 12/15/1964			
<u>Document Detail</u>					
Doc Desc: Doc Date:		Reclamation Certificate Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M 3/15/1965			
28	2 of 6	SE/179.5	1,087.0 / 7.14	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	ESAR
ESA ID: ESRD File: File Classification: Name: 10tm Point Coordinate: LLD:		1345558 SCD01756 SCD 68582,5664739 5;1;25;24;NW			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<hr/>					
LINC:		0021032610			
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=1345558			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD01756			
 <u>Document Detail</u>					
Doc Desc:		PHASE I ESA			
Doc Date:		3/1/2008			
 <u>Document Detail</u>					
Doc Desc:		PHASE II ESA			
Doc Date:		10/1/2008			
<hr/>					
<u>28</u>	3 of 6	SE/179.5	1,087.0 / 7.14	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	ESAR
ESA ID:		1345558			
ESRD File:		00125843			
File Classification:		REC			
Name:					
10tm Point Coordinate:		68582,5664739			
LLD:		5;1;25;24;NW 5;1;25;24;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=1345558			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00125843			
 <u>Document Detail</u>					
Doc Desc:		PHASE II ESA			
Doc Date:		10/1/2008			
 <u>Document Detail</u>					
Doc Desc:		PHASE I ESA			
Doc Date:		3/1/2008			
<hr/>					
<u>28</u>	4 of 6	SE/179.5	1,087.0 / 7.14	Reclamation NW-24-25-1-5 AB	ESAR
ESA ID:		2792955			
ESRD File:		00125843			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		68582,5664739			
LLD:		5;1;25;24;NW 5;1;25;24;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2792955			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00125843			
 <u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M			
Doc Date:		3/15/1965			
 <u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Doc Date:		12/15/1964			
28	5 of 6	SE/179.5	1,087.0 / 7.14	Calgary 10524 - 15 St NE 1620 - 96 Ave NE AB	ESAR
ESA ID:		1345558			
ESRD File:		00125843			
File Classification:		REC			
Name:					
10tm Point Coordinate:		68581,5664739			
LLD:		5;1;25;24;NW 5;1;25;24;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=1345558			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00125843			
<u>Document Detail</u>					
Doc Desc:		PHASE I ESA			
Doc Date:		3/1/2008			
<u>Document Detail</u>					
Doc Desc:		PHASE II ESA			
Doc Date:		10/1/2008			
28	6 of 6	SE/179.5	1,087.0 / 7.14	Reclamation NW-24-25-1-5 AB	ESAR
ESA ID:		2792955			
ESRD File:		00125843			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		68581,5664739			
LLD:		5;1;25;24;NW 5;1;25;24;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2792955			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00125843			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M			
Doc Date:		12/15/1964			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - R OF E CANCELLATION (NOT ABANDONED) IN W 24- 25- 1 W5M			
Doc Date:		3/15/1965			
29	1 of 1	W/179.8	1,077.0 / -2.86	One Man and a Ladybug Ltd. 327 Coventry Close NE Calgary AB T3K 4C5	CHEM
Certificate NO:		155227-01-00		Approval Type: Renewal	
Status:		Operating		DLS:	
Status Date:		31-Oct-01		Lot:	
Effective Date:		1-Apr-09		Block:	
Expiry Date:		31-Mar-19		Plan:	
Description:		Structural			
Facility Name:		Pesticide Service Registration			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Operator:		One Man and a Ladybug Ltd.			
Mailing Address:		327 COVENTRY CLOSE NE, Calgary, AB, T3K 4C5			

<u>30</u>	1 of 1	ENE/182.8	1,089.0 / 9.14	AB	WWIS
Well ID:	467800			Elevation Source:	Not Obtained
Driller ID:	24621			Method of Drilling:	
Licence No:				GPS Obtained:	Not Verified
GIC Well ID:	467800			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):				Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	Yes
Block:				Submitted?:	Yes
Plan:				Location Locked?:	Yes
Type of Work:				Longitude:	-114.007577
Flowing Well:				Latitude:	51.158031
Date Started:				LSD:	SE
Water Req Per Day:				Section:	25
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5
Drilling Company:				DLS Coordinates:	SE-25-25-1-5
Owner Mailing Address:					
Driller Mailing Address:					

Well Reports

Well Report ID:	11426213	Annular Seal Mat:	Unknown
Well Owner ID:	11426214	Annular Seal from:	
Driller ID:	10776669	Annular Seal to:	
Drill Company ID:	24621	Annular Seal Amt:	
Drill Instance ID:	10776670	Annular Seal Units:	
Drill Comp Well ID:		Drilling Method:	Unknown
Existing Well ID:		Drilling Start Dt:	
Date Received:	2/10/2008 0:00:00	Drilling End Dt:	
Type of Work:	Existing Well-Decommissioned	Pack Type:	Unknown
Plug Date:	8/7/2007 0:00:00	Pack Grain Size:	
Plug Material Type:	Cement	Pack Amount:	
Plug Mat Amount:		Pack Units:	Unknown
Plugged Units:		Loc Verify Method:	Not Verified
Well Use:	Unknown	Dist Casing Ground:	
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:		Artesian Flow Rate:	
Finish Well Depth:		Gas Depth:	
Casing Material:	Unknown	Encounter Gas?:	No
Casing OD:		Flow Ctrl Install?:	No
Casing Thickness:		Recommended Rate:	
Casing Bottom:		Recom Intake Depth:	
Liner Material:	Unknown	Pump Installed?:	No
Liner OD:		Pump Install Depth:	
Liner Thickness:		Pump Model:	
Liner Top:		Pump Horsepower:	
Liner Bottom:		Well Disinfected?:	No
Perforation by:	Unknown	Other Log:	
Screen Material:		Divert Water Src:	
Screen Size OD:		Divert Water Amt:	
Screen Attachment:		Diversion Dt/Time:	
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Encounter Saline Water?:		No			
Saline Water Depth:					
Potability Sample Taken?:		No			
Potable Sample Sent to AENV?:		No			
Approval Holder Sign Date:					
Drilling Report Given to Owner:		No			
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:					
Submitted by:					
Additional Comments:		LOCATED NW CORNER OF COUNTRY HILLS BLVD. AND BARLOW TRAIL. CASING CUT 18 INCHES BELOW GROUND. ENVIRO PLUG MONITORING WELL GROUT WAS USED TO BACKFILL WELL. 25 BAGS. THE ENVIRO PLUG GROUT WAS TREMIE PUMPED INTO HOLE, VERY DIRTY WATER AND SILT DISPLACED FROM WELL DURING GROUTING PROCEDURES.			
<u>Well Owners</u>					
Well Owner ID:		11426214			
Owner Name:		CALGARY, CITY OF			
PO Box:					
Address:		BOX 2100 STATION M			
City:		CALGARY			
Postal Code:		T2P 2M5			
Province:		ALBERTA			
Country:		CA			
<u>Drillers</u>					
Driller ID:		10776669			
Last Name:		WEGLEITNER			
Middle Initial:					
First Name:		GARRY			
Journeyman No:		0000			
Is Active?:		Yes			
<u>Drilling Companies</u>					
Starting Well ID:		1125000			
Ending Well ID:		1129999			
Last Well ID Used:		1125065			
Company Name:		BECK DRILLING & ENVIRONMENTAL SERVICES LTD.			
Street Address:		543 71 AVE SE			
City:		CALGARY			
Province:		AB			
Country:		CA			
Postal Code:		T2H 2Y2			
E-Mail:		GWINFO@GOV.AB.CA			
Is Active?:		No			
<u>Geophysical Logs</u>					
Geophysical Log ID:		5682844			
Log Type:		Electric			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Geophysical Logs</u>					
Geophysical Log ID:		6085919			
Log Type:		Gamma			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Log Taken?:		No			
Sent to AENV?:		No			
<u>Pump Tests</u>					
Pump Test ID:		11426215			
Test Date:					
Start Time:		1/12/1900 0:00:00			
Taken from Top of Casing:		No			
Static Water Level:		49.5			
End Water Level:					
Water Removal Type:		Unknown			
Water Removal Rate:					
Removal Depth from:					
Reason for Short Test:					
<u>Well Reports</u>					
Well Report ID:	467800			Annular Seal Mat:	Driven & Bentonite
Well Owner ID:	10741745			Annular Seal from:	0
Driller ID:	2533726			Annular Seal to:	118
Drill Company ID:	24227			Annular Seal Amt:	
Drill Instance ID:	8335390			Annular Seal Units:	
Drill Comp Well ID:				Drilling Method:	Rotary
Existing Well ID:				Drilling Start Dt:	8/20/1997 0:00:00
Date Received:	9/17/1997 0:00:00			Drilling End Dt:	8/25/1997 0:00:00
Type of Work:	New Well			Pack Type:	
Plug Date:				Pack Grain Size:	
Plug Material Type:				Pack Amount:	
Plug Mat Amount:				Pack Units:	
Plugged Units:				Loc Verify Method:	Not Verified
Well Use:	Domestic			Dist Casing Ground:	
Other Well Use:				Artesian Flow?:	No
Total Depth Drill:	240			Artesian Flow Rate:	
Finish Well Depth:				Gas Depth:	
Casing Material:				Encounter Gas?:	No
Casing OD:	0			Flow Ctrl Install?:	No
Casing Thickness:	0			Recommended Rate:	2
Casing Bottom:	0			Recom Intake Depth:	155
Liner Material:	Steel			Pump Installed?:	No
Liner OD:	5.56			Pump Install Depth:	
Liner Thickness:	0.188			Pump Model:	
Liner Top:	0			Pump Horsepower:	
Liner Bottom:	157			Well Disinfected?:	No
Perforation by:	Torch			Other Log:	
Screen Material:				Divert Water Src:	
Screen Size OD:	0			Divert Water Amt:	
Screen Attachment:				Diversion Dt/Time:	
Screen Top Fitting:				Is Submitted?:	Yes
Screen Bot Fitting:				Is Validated?:	Yes
Encounter Saline Water?:	No				
Saline Water Depth:					
Potability Sample Taken?:	No				
Potable Sample Sent to AENV?:	No				
Approval Holder Sign Date:					
Drilling Report Given to Owner:	No				
Model Output Rating:					
Remedial Action:					
Flow Control Description:					
Pump Type Installed:					
Created by:					
Submitted by:					
Additional Comments:		DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 21". FIELD TEST 550 TDS, SOFT WATER.			

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<u>Well Owners</u>					
Well Owner ID:		10741745			
Owner Name:		SPRUCE LANE FARMS LTD			
PO Box:					
Address:		28 AREA RD NE, CALGARY			
City:					
Postal Code:		T2E 8E5			
Province:					
Country:					
<u>Drillers</u>					
Driller ID:		2533726			
Last Name:		DRILLER			
Middle Initial:		NA			
First Name:		UNKNOWN			
Journeyman No:		1			
Is Active?:		Yes			
<u>Drilling Companies</u>					
Starting Well ID:		1475000			
Ending Well ID:		1479999			
Last Well ID Used:		1477040			
Company Name:		M&M DRILLING CO. LTD.			
Street Address:		BOX 1, SITE 22, RR 2			
City:		STRATHMORE			
Province:		AB			
Country:		CA			
Postal Code:		T1P 1K5			
E-Mail:		murraywh@mmdrilling.ca			
Is Active?:		Yes			
<u>Perforations</u>					
Perforation ID:		4189416			
From:		121			
To:		157			
Diameter:		0.125			
Interval:		10			
<u>Geophysical Logs</u>					
Geophysical Log ID:		5515828			
Log Type:		Electric			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Geophysical Logs</u>					
Geophysical Log ID:		5918903			
Log Type:		Gamma			
Log Taken?:		No			
Sent to AENV?:		No			
<u>Boreholes</u>					
Borehole ID:		618036			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Diameter:		0			
From:		0			
To:		240			
<u>Lithologies</u>					
Depth:		25			
Water Bearing:		Yes			
Colour:		Blue			
Description:		Water Bearing			
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		96			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		155			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		197			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		215			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		45			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		57			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Sandstone			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Lithologies</u>					
Depth:			152		
Water Bearing:			No		
Colour:			Blue		
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			14		
Water Bearing:			No		
Colour:			Brown		
Description:					
Material:			Clay & Rocks		
<u>Lithologies</u>					
Depth:			16		
Water Bearing:			No		
Colour:			Brown		
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			55		
Water Bearing:			No		
Colour:			Blue		
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			20		
Water Bearing:			No		
Colour:			Blue		
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			174		
Water Bearing:			No		
Colour:			Blue		
Description:					
Material:			Shale		
<u>Lithologies</u>					
Depth:			236		
Water Bearing:			No		
Colour:			Blue		
Description:					
Material:			Sandstone		
<u>Lithologies</u>					
Depth:			47		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		94			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		176			
Water Bearing:		No			
Colour:		Dark Blue			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		120			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		229			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		240			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Pump Tests</u>					
Pump Test ID:		10379245			
Test Date:		8/28/1997 0:00:00			
Start Time:		1/12/1900 0:00:00			
Taken from Top of Casing:		No			
Static Water Level:		48			
End Water Level:		130			
Water Removal Type:		Pump			
Water Removal Rate:		2.8			
Removal Depth from:		156			
Reason for Short Test:					
<u>Pump Test Items</u>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Pump Test Item ID:		8189601			
Minutes:		8			
Pumping Depth:		68.31			
Recovery Depth:		110.9			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189604			
Minutes:		12			
Pumping Depth:		74.29			
Recovery Depth:		106.33			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189610			
Minutes:		35			
Pumping Depth:		97.94			
Recovery Depth:		85.48			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189613			
Minutes:		60			
Pumping Depth:		113.58			
Recovery Depth:		76			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189615			
Minutes:		90			
Pumping Depth:		123.54			
Recovery Depth:		68			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189606			
Minutes:		16			
Pumping Depth:		79.63			
Recovery Depth:		102.23			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189611			
Minutes:		40			
Pumping Depth:		101.54			
Recovery Depth:		84.75			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189612			
Minutes:		50			
Pumping Depth:		107.69			
Recovery Depth:		78.63			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189596			
Minutes:		3			
Pumping Depth:		58.85			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Recovery Depth:		117.44			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189608			
Minutes:		25			
Pumping Depth:		89.4			
Recovery Depth:		94.54			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189609			
Minutes:		30			
Pumping Depth:		93.88			
Recovery Depth:		91.08			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189617			
Minutes:		120			
Pumping Depth:		130.13			
Recovery Depth:		62.85			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189594			
Minutes:		1			
Pumping Depth:		53.27			
Recovery Depth:		125.04			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189595			
Minutes:		2			
Pumping Depth:		55.58			
Recovery Depth:		119.42			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189597			
Minutes:		4			
Pumping Depth:		60.21			
Recovery Depth:		116.08			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189614			
Minutes:		75			
Pumping Depth:		118.69			
Recovery Depth:		71.13			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189616			
Minutes:		105			
Pumping Depth:		127.29			
Recovery Depth:		65.38			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Pump Test Items</u>					
Pump Test Item ID:		8189598			
Minutes:		5			
Pumping Depth:		62.85			
Recovery Depth:		114.77			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189600			
Minutes:		7			
Pumping Depth:		67.13			
Recovery Depth:		112.08			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189607			
Minutes:		20			
Pumping Depth:		84.71			
Recovery Depth:		98.44			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189599			
Minutes:		6			
Pumping Depth:		113.35			
Recovery Depth:					
<u>Pump Test Items</u>					
Pump Test Item ID:		8189602			
Minutes:		9			
Pumping Depth:		70.58			
Recovery Depth:		109.54			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189603			
Minutes:		10			
Pumping Depth:		71.58			
Recovery Depth:		108.52			
<u>Pump Test Items</u>					
Pump Test Item ID:		8189605			
Minutes:		14			
Pumping Depth:		77.46			
Recovery Depth:		104.15			

[31](#) 1 of 2 WSW/183.7 1,060.0 / -19.89 PIONEER CANADA CROSSFIELD 14-23-25-1 **AERW**

AB

Well ID:	00/14-23-025-01W5/0	Agent:	
Well Status:	0602030000	Operator:	
Keylist:	0255012314000	Field:	0267
License No:	0022789	Pool:	0176001
Licence Status:	Issued	OS Area:	
Licence Date:	1962-08-01	OS Dep:	0000000
Stat Date:	1973-04-04	Max Tvd:	0

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Well Fluid:	WATER			Ground Elevation:	1059.5
Well Mode:	ABD			Surf Loc:	
Well Type:	INJ			EDCT:	
Well Structure:	N/A			Rating Ev:	
Scheme Type:	Conventional ER			Op Surv Prov:	
Scheme Subt:	Waterflood			FD Date:	1962-08-18
Bttm/Surface Hole:	Bottom Holes			Total Dep:	1777.6
Fluid Short Desc:	WATER			KBE:	1063.1
Mode Short Desc:	ABANDONED			Latitude:	51.152373
Type Short Desc:	INJECTION			Longitude:	-114.038585
Update:					
Structure Short Description:	Not Applicable				
Licensee:	Devon Canada Corporation				

31	2 of 2	WSW/183.7	1,060.0 / -19.89	Devon Canada Corporation(0K29)	AERW
				AB	
Well ID:				Agent:	
Well Status:				Operator:	
Keylist:				Field:	
License No:	0022789			Pool:	
Licence Status:	RecCertified			OS Area:	
Licence Date:	29 May 1979			OS Dep:	
Stat Date:				Max Tvd:	
Well Fluid:				Ground Elevation:	1059.5
Well Mode:				Surf Loc:	14-23-025-01W5
Well Type:				EDCT:	BWL
Well Structure:				Rating Ev:	J
Scheme Type:				Op Surv Prov:	
Scheme Subt:				FD Date:	
Bttm/Surface Hole:	Surface Holes			Total Dep:	
Fluid Short Desc:				KBE:	1063.1
Mode Short Desc:				Latitude:	51.152373
Type Short Desc:				Longitude:	-114.038585
Update:					
Structure Short Description:					
Licensee:					

32	1 of 2	WSW/185.1	1,060.0 / -19.83	AB	FAC
Facility ID:	ABWS0000107			LE:	
Facility Name:	Baysel Cross R1 15-23-25-1			LSD:	
Licence No:				Section:	
Licensee Code:				Township:	
Operational Status:				Range:	
Operator Code:				Meridian:	
Sub Type Code:	901			EDCT Code:	
Sub Type:	Water Source (Alberta Environment Licensed)			EDCT Short Desc.:	
EDCT Description:					
<u>Facility List Shapefile Details</u>					
Lic BA ID:				Licensee:	
Lic Type:				EDCT Type:	
Fac Name:	Baysel Cross R1 15-23-25-1			EDCT Desc:	
Fac Status:				Loc Source:	LSD Centre

32	2 of 2	WSW/185.1	1,060.0 / -19.83	Baysel Cross R1 15-23-25-1	OGF
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Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
AB					
Facility ID:	ABWS0000107				
Licence No:					
LE:					
Location Latitude:	51.152381				
Location Longitude:	-114.033641				
<u>Facility List Shapefile</u>					
Fac Status:			Sub Code:	901	
OP BA ID:			Fac Sub TY:	Water Source (Alberta Environment Licensed)	
Lic BA ID:			EDCT Type:		
Lic Type:			EDCT Descr:		
Licensee:			Loc Source:	LSD Centre	
Operator:					
<u>33</u>	1 of 2	WSW/185.8	1,060.0 / -19.89	AB	AOGW
Licence NO:	0022789			ATS Coordinates:	14-23-25-1-5
Licence Date:	19620801			Structure:	
Mode:	ABANDONED			Type:	INJECTION
Well Status Date:	19730404			Fluid:	WATER
Total Depth (m):	1777.60			Licencee:	Northstar Energy Corporation
Final Drill Date:	19620818				
Well Name:	PIONEER CANADA CROSSFIELD 14-23-25-1				
Licencee Address:	1600, 324 - 8 Avenue SW Calgary, AB T2P 2Z5				
<u>33</u>	2 of 2	WSW/185.8	1,060.0 / -19.89	AB	AOGW
Licence NO:	0038439			ATS Coordinates:	14-23-25-1-5
Licence Date:	19700717			Structure:	
Mode:	ABANDONED			Type:	
Well Status Date:	19701105			Fluid:	
Total Depth (m):	0228.60			Licencee:	Petro-Canada
Final Drill Date:	19700728				
Well Name:	BAYSEL ET AL CROSS WW 14-23-25-1				
Licencee Address:	Box 2844, 150 - 6 Avenue SW Floor 10 Calgary, AB T2P 3E3				
<u>34</u>	1 of 1	NNE/191.5	1,087.0 / 7.14	AB	WWIS
Well ID:	12011273			Elevation Source:	Not Obtained
Driller ID:	24659			Method of Drilling:	
Licence No:				GPS Obtained:	Not Verified
GIC Well ID:	1305458			Boundary From:	
GOA Well Tag No:				Distance North:	
Elevation (ft):				Distance South:	
Depth (ft):				Distance East:	
Date Completed:				Distance West:	
Proposed Use:				Additional Desc:	
Lot:				Validated?:	No
Block:				Submitted?:	No
Plan:				Location Locked?:	No
Type of Work:				Longitude:	-114.019188
Flowing Well:				Latitude:	51.15792
Date Started:				LSD:	SW
Water Req Per Day:				Section:	25

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Gas Present:				Township:	25
Oil Present:				Range:	1
Flow Rate:				Meridian:	5
Drilling Company:				DLS Coordinates:	SW-25-25-1-5
Owner Mailing Address:					
Driller Mailing Address:					

Well Reports

Well Report ID:	12012196	Annular Seal Mat:	Bentonite Slurry
Well Owner ID:	12012402	Annular Seal from:	0
Driller ID:	12000056	Annular Seal to:	95
Drill Company ID:	24659	Annular Seal Amt:	120
Drill Instance ID:		Annular Seal Units:	Gallons
Drill Comp Well ID:		Drilling Method:	Rotary - Mud
Existing Well ID:		Drilling Start Dt:	9/25/2012 0:00:00
Date Received:	10/2/2012 0:00:00	Drilling End Dt:	9/25/2012 0:00:00
Type of Work:	New Well	Pack Type:	
Plug Date:		Pack Grain Size:	
Plug Material Type:		Pack Amount:	
Plug Mat Amount:		Pack Units:	
Plugged Units:		Loc Verify Method:	
Well Use:	Domestic	Dist Casing Ground:	22
Other Well Use:		Artesian Flow?:	No
Total Depth Drill:	232	Artesian Flow Rate:	
Finish Well Depth:	232	Gas Depth:	
Casing Material:	Plastic	Encounter Gas?:	No
Casing OD:	6	Flow Ctrl Install?:	No
Casing Thickness:	0.38	Recommended Rate:	4
Casing Bottom:	95	Recom Intake Depth:	200
Liner Material:	Plastic	Pump Installed?:	No
Liner OD:	4.5	Pump Install Depth:	
Liner Thickness:	0.237	Pump Model:	
Liner Top:	90	Pump Horsepower:	
Liner Bottom:	232	Well Disinfected?:	Yes
Perforation by:	Saw	Other Log:	
Screen Material:		Divert Water Src:	TOWN OF STRATHMORE
Screen Size OD:		Divert Water Amt:	2000
Screen Attachment:		Diversion Dt/Time:	9/26/2012 1:00:00
Screen Top Fitting:		Is Submitted?:	Yes
Screen Bot Fitting:		Is Validated?:	Yes
Encounter Saline Water?:	No		
Saline Water Depth:			
Potability Sample Taken?:	No		
Potable Sample Sent to AENV?:	No		
Approval Holder Sign Date:	10/2/2012 0:00:00		
Drilling Report Given to Owner:	Yes		
Model Output Rating:			
Remedial Action:			
Flow Control Description:			
Pump Type Installed:			
Created by:	{8464950F-7A58-403F-A673-9B788A3F13CA}		
Submitted by:	{8464950F-7A58-403F-A673-9B788A3F13CA}		
Additional Comments:			

Well Owners

Well Owner ID:	12012402
Owner Name:	LEES, TOM
PO Box:	
Address:	11420 -15 STREET NE
City:	CALGARY
Postal Code:	T3K 5Y8
Province:	ALBERTA

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Country:		CANADA			
<u>Drillers</u>					
Driller ID:		12000056			
Last Name:		PHILLIPS			
Middle Initial:					
First Name:		MICHAEL			
Journeyman No:		136572A			
Is Active?:		Yes			
<u>Drilling Companies</u>					
Starting Well ID:		1305000			
Ending Well ID:		1309999			
Last Well ID Used:		1305787			
Company Name:		GERRITSEN DRILLING			
Street Address:		BOX 187			
City:		ROCKYFORD			
Province:		ALBERTA			
Country:		CANADA			
Postal Code:		T0J 2R0			
E-Mail:		drilling@ccewireless.ca			
Is Active?:		Yes			
<u>Perforations</u>					
Perforation ID:		4274737			
From:		202			
To:		232			
Diameter:		0.187			
Interval:		3			
<u>Boreholes</u>					
Borehole ID:		809497			
Diameter:		7.88			
From:		0			
To:		92			
<u>Boreholes</u>					
Borehole ID:		809498			
Diameter:		5.875			
From:		92			
To:		95			
<u>Boreholes</u>					
Borehole ID:		809499			
Diameter:		5.125			
From:		95			
To:		232			
<u>Lithologies</u>					
Depth:		116			
Water Bearing:		No			
Colour:		Gray			
Description:					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Material:		Shale			
<u>Lithologies</u>					
Depth:		136			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		60			
Water Bearing:		No			
Colour:		Brown			
Description:					
Material:		Clay & Rocks			
<u>Lithologies</u>					
Depth:		105			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		145			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		231			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		5			
Water Bearing:		No			
Colour:		Brown			
Description:					
Material:		Sand			
<u>Lithologies</u>					
Depth:		176			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Depth:		225			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		2			
Water Bearing:		No			
Colour:		Dark Brown			
Description:					
Material:		Clay			
<u>Lithologies</u>					
Depth:		77			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Clay			
<u>Lithologies</u>					
Depth:		94			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		197			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		229			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		121			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		141			
Water Bearing:		No			
Colour:		Blue			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		185			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		201			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale & Coal			
<u>Lithologies</u>					
Depth:		206			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		108			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			
<u>Lithologies</u>					
Depth:		128			
Water Bearing:		No			
Colour:		Blue			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		157			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Lithologies</u>					
Depth:		165			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Sandstone			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Lithologies</u>					
Depth:		232			
Water Bearing:		No			
Colour:		Gray			
Description:					
Material:		Shale			
<u>Pump Tests</u>					
Pump Test ID:		16009904			
Test Date:		9/27/2012 0:00:00			
Start Time:		10/17/2012 9:00:00			
Taken from Top of Casing:		Yes			
Static Water Level:		50.45			
End Water Level:					
Water Removal Type:		PUMP			
Water Removal Rate:		3.99			
Removal Depth from:		213.25			
Reason for Short Test:					
<u>Pump Test Items</u>					
Pump Test Item ID:		12167359			
Minutes:		18			
Pumping Depth:		253.24			
Recovery Depth:		385.77			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167351			
Minutes:		2			
Pumping Depth:		167.52			
Recovery Depth:		385.47			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167368			
Minutes:		90			
Pumping Depth:		362.13			
Recovery Depth:		220.06			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167352			
Minutes:		4			
Pumping Depth:		169.37			
Recovery Depth:		385.95			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167355			
Minutes:		10			
Pumping Depth:		214.72			
Recovery Depth:		386.38			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167372			
Minutes:		156			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Pumping Depth:					
Recovery Depth:		210.07			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167350			
Minutes:		0			
Pumping Depth:		165.55			
Recovery Depth:		385.51			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167353			
Minutes:		6			
Pumping Depth:		171.08			
Recovery Depth:		385.97			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167370			
Minutes:		120			
Pumping Depth:		375.21			
Recovery Depth:		213.04			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167354			
Minutes:		8			
Pumping Depth:		196.9			
Recovery Depth:		386.42			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167361			
Minutes:		22			
Pumping Depth:		266.75			
Recovery Depth:		358.97			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167367			
Minutes:		80			
Pumping Depth:		355.61			
Recovery Depth:		224.91			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167357			
Minutes:		14			
Pumping Depth:		237.12			
Recovery Depth:		387.01			
<u>Pump Test Items</u>					
Pump Test Item ID:		12167362			
Minutes:		24			
Pumping Depth:		272.29			
Recovery Depth:		347.24			

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction/ Distance (m)</i>	<i>Elev/Diff (m)</i>	<i>Site</i>	<i>DB</i>
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167366		
<i>Minutes:</i>			60		
<i>Pumping Depth:</i>			337.45		
<i>Recovery Depth:</i>			242.91		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167369		
<i>Minutes:</i>			100		
<i>Pumping Depth:</i>			367.31		
<i>Recovery Depth:</i>			216.8		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167356		
<i>Minutes:</i>			12		
<i>Pumping Depth:</i>			226.73		
<i>Recovery Depth:</i>			386.88		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167358		
<i>Minutes:</i>			16		
<i>Pumping Depth:</i>			245.45		
<i>Recovery Depth:</i>			387.36		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167365		
<i>Minutes:</i>			50		
<i>Pumping Depth:</i>			324.98		
<i>Recovery Depth:</i>			258.96		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167360		
<i>Minutes:</i>			20		
<i>Pumping Depth:</i>			260.48		
<i>Recovery Depth:</i>			371.18		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167363		
<i>Minutes:</i>			30		
<i>Pumping Depth:</i>			288.38		
<i>Recovery Depth:</i>			316.33		
<u>Pump Test Items</u>					
<i>Pump Test Item ID:</i>			12167364		
<i>Minutes:</i>			40		
<i>Pumping Depth:</i>			308.57		
<i>Recovery Depth:</i>			282.64		
<u>Pump Test Items</u>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Pump Test Item ID:		12167371			
Minutes:		168			
Pumping Depth:		385.51			
Recovery Depth:					

35	1 of 3	E/195.5	1,094.0 / 14.09	PETRO-CANADA / A & W 2600 COUNTRY HILLS BV NE AB	CBL
Comdistnm:	STONEGATE LANDING			City Quadrants:	4
Latitude:	51.1547390750966			Ward Boundaries:	11
Longitude:	-113.997970435537			Calgary Communities:	6
Location:	(51.1547390750966, -113.997970435537)				

Licence Type Information

Licence Types: MOTOR VEHICLE REPAIR AND SERVICE (2-PROV N/R)
Job Status: RENEWAL LICENSED
Job Created Date: 2017/12/05

35	2 of 3	E/195.5	1,094.0 / 14.09	PETRO-CANADA / A & W 2600 COUNTRY HILLS BV NE AB	CTNK
Comdistnm:	STONEGATE LANDING			City Quadrants:	
Latitude:	51.1547390750966			Ward Boundaries:	
Longitude:	-113.997970435537			Calgary Communities:	
Location:	(51.1547390750966, -113.997970435537)				

Licence Type Information

Licence Types: FUEL SALES/STORAGE
Job Status: RENEWAL LICENSED
Job Created Date: 2017/12/05

35	3 of 3	E/195.5	1,094.0 / 14.09	STONEGATE NEIGHBOURS 77872 2600-COUNTRY HILLS BLVD. NE CALGARY AB AB	FST
Site No:	10434			Dt Form Rcvd:	
Tank No:				Date Removed:	
No of Tanks:				Removal Reason:	
Tank Type:				Located 200m:	
Tank Status:				Located 500m:	
Site Status:	Active			DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	
Contents:				Plan:	
Other Contents:				Municipality:	
Capacity:				Postal:	
Other Capacity:				Facility 1:	
UST Secondary:				Facility 2:	
AST Secondary:				Facility 3:	
Overfill Prevention:				Facility 4:	
LLD:	Lot 6 Block 1 Plan 1610330				
Spill Containment:					
Tank Status by Site Name:	Active Tanks				

Active Tank Sites

UST/AST: 4 / 0

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
36	1 of 1	E/209.0	1,093.0 / 13.12	COUNTRY HILLS COLLISION 24 FREEPORT LD NE AB	CBL
Comdistnm:	STONEY 2			City Quadrants:	4
Latitude:	51.1521739727413			Ward Boundaries:	11
Longitude:	-114.012535912065			Calgary Communities:	13
Location:	(51.1521739727413, -114.012535912065)				
<u>Licence Type Information</u>					
Licence Types:	MOTOR VEHICLE REPAIR AND SERVICE (1)				
Job Status:	PENDING RENEWAL				
Job Created Date:	2017/05/18				
<u>Licence Type Information</u>					
Licence Types:	AUTO BODY SHOP				
Job Status:	PENDING RENEWAL				
Job Created Date:	2017/05/18				
37	1 of 4	SW/216.8	1,077.1 / -2.72	Reclamation NE-23-25-1-5 AB	ESAR
ESA ID:	2624469				
ESRD File:	00108527				
File Classification:	REC				
Name:	Reclamation				
10tm Point Coordinate:	67775,5664616				
LLD:	5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW				
LINC:					
Map Link:	http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469				
ESAR Link:	http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527				
<u>Document Detail</u>					
Doc Desc:	Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M				
Doc Date:	9/14/1982				
<u>Document Detail</u>					
Doc Desc:	Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M				
Doc Date:	6/14/1982				
37	2 of 4	SW/216.8	1,077.1 / -2.72	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE AB	ESAR
ESA ID:	8058562				
ESRD File:	SCD02333				
File Classification:	SCD				
Name:	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE				
10tm Point Coordinate:	67775,5664616				
LLD:	5;1;25;23;NE 7598JK;				
LINC:	0035522219 0035522219 0025893330 0035522219 0032569478				
Map Link:	http://www.esar.alberta.ca/esarmap.aspx?esaid=8058562				
ESAR Link:	http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333				

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
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Document Detail

Doc Desc: Various Correspondence for Dry Waste Site For Alberta Transportation.pdf
Doc Date: 8/4/1992

37	3 of 4	SW/216.8	1,077.1 / -2.72	Reclamation NE-23-25-1-5 AB	ESAR
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ESA ID: 2624469
ESRD File: SCD02333
File Classification: SCD
Name: Reclamation
10tm Point Coordinate: 67775,5664616
LLD: 5;1;25;23;NE 7598JK;
LINC: 0035522219 0035522219 0025893330 0035522219 0032569478
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333>

Document Detail

Doc Desc: Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 9/14/1982

Document Detail

Doc Desc: Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M
Doc Date: 6/14/1982

37	4 of 4	SW/216.8	1,077.1 / -2.72	Reclamation 8-26-25-1-5 AB	ESAR
--------------------	--------	----------	-----------------	----------------------------------	------

ESA ID: 2689695
ESRD File: 00108527
File Classification: REC
Name: Reclamation
10tm Point Coordinate: 67775,5664616
LLD: 5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=2689695>
ESAR Link: <http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527>

Document Detail

Doc Desc: Reclamation Certificate Documentation - CANPET ET AL CALG CROSS 8-26-25-1
Doc Date: 5/23/1978

Document Detail

Doc Desc: Reclamation Application Documentation - CANPET ET AL CALG CROSS 8-26-25-1
Doc Date: 2/23/1978

38	1 of 5	NNE/225.1	1,086.0 / 6.14	Harmony Logistics (Excl) 1724 - 115 AVE NE Calgary AB T3K 0P9	GEN
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Approval No: **DLS:**

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Record ID: Approval Year:		May 2012- Jan 2013		Phone: Contact:	403-648-4898 Ryan Amey
38	2 of 5	NNE/225.1	1,086.0 / 6.14	Harmony Logistics (Excl) 1724 - 115 AVE NE Calgary AB T3K 0P9	GEN
Approval No: Record ID: Approval Year:		Feb 2013 - Sep 2013		DLS: Phone: Contact:	403-648-4898 Ryan Amey
38	3 of 5	NNE/225.1	1,086.0 / 6.14	Harmony Logistics (Exel) 1724 - 115 AVE NE Calgary AB T3K 0P9 AB	GEN
Approval No: Record ID: Approval Year:		Feb 2015		DLS: Phone: Contact:	403-648-4896 John Contrada
38	4 of 5	NNE/225.1	1,086.0 / 6.14	Harmony Logistics (Exel) 1724 - 115 AVE NE Calgary AB T3K 0P9 AB	GEN
Approval No: Record ID: Approval Year:		Jan 2016		DLS: Phone: Contact:	403-648-4896 John Contrada
38	5 of 5	NNE/225.1	1,086.0 / 6.14	Harmony Logistics (Exel) 1724 - 115 AVE NE Calgary AB T3K 0P9 AB	GEN
Approval No: Record ID: Approval Year:		Dec 2016; Apr 2017; Aug 2018		DLS: Phone: Contact:	John Contrada
39	1 of 4	WSW/226.7	1,059.0 / -20.86	Reclamation 8-26-25-1-5 AB	ESAR
ESA ID:		2689695			
ESRD File:		00108527			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		67458,5664903			
LLD:		5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2689695			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - CANPET ET AL CALG CROSS 8-26-25-1			
Doc Date:		2/23/1978			
<u>Document Detail</u>					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Doc Desc:		Reclamation Certificate Documentation - CANPET ET AL CALG CROSS 8-26-25-1			
Doc Date:		5/23/1978			
39	2 of 4	WSW/226.7	1,059.0 / -20.86	Reclamation NE-23-25-1-5 AB	ESAR
ESA ID:		2624469			
ESRD File:		SCD02333			
File Classification:		SCD			
Name:		Reclamation			
10tm Point Coordinate:		67458,5664903			
LLD:		5;1;25;23;NE 7598JK;			
LINC:		0035522219 0035522219 0025893330 0035522219 0032569478			
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333			
<u>Document Detail</u>					
Doc Desc:		Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M			
Doc Date:		6/14/1982			
<u>Document Detail</u>					
Doc Desc:		Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M			
Doc Date:		9/14/1982			
39	3 of 4	WSW/226.7	1,059.0 / -20.86	ALBERTA TRANSPORTATION FORMER DRYWASTE SITE AB	ESAR
ESA ID:		8058562			
ESRD File:		SCD02333			
File Classification:		SCD			
Name:		ALBERTA TRANSPORTATION FORMER DRYWASTE SITE			
10tm Point Coordinate:		67458,5664903			
LLD:		5;1;25;23;NE 7598JK;			
LINC:		0035522219 0035522219 0025893330 0035522219 0032569478			
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=8058562			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=SCD02333			
<u>Document Detail</u>					
Doc Desc:		Various Correspondence for Dry Waste Site For Alberta Transportation.pdf			
Doc Date:		8/4/1992			
39	4 of 4	WSW/226.7	1,059.0 / -20.86	Reclamation NE-23-25-1-5 AB	ESAR
ESA ID:		2624469			
ESRD File:		00108527			
File Classification:		REC			
Name:		Reclamation			
10tm Point Coordinate:		67458,5664903			
LLD:		5;1;25;23;NE 5;1;25;23;NW 5;1;25;26;SE 5;1;25;26;SW			
LINC:					
Map Link:		http://www.esar.alberta.ca/esarmap.aspx?esaid=2624469			
ESAR Link:		http://www.esar.alberta.ca/esarmain.aspx?esaid=00108527			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Document Detail</u>					
Doc Desc:	Reclamation Application Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M				
Doc Date:	6/14/1982				
<u>Document Detail</u>					
Doc Desc:	Reclamation Certificate Documentation - PIPELINE FROM N 23- 25- 1W5M TO S 26- 25- 1W5M				
Doc Date:	9/14/1982				
40	1 of 1	S/251.6	1,083.3 / 3.45	COMPLETION TOOLS #40 10221 15 ST NE AB	CBL
Comdistnm:	STONEY 2			City Quadrants:	4
Latitude:	51.1452683372379			Ward Boundaries:	11
Longitude:	-114.025872612697			Calgary Communities:	13
Location:	(51.1452683372379, -114.025872612697)				
<u>Licence Type Information</u>					
Licence Types:	MANUFACTURER				
Job Status:	RENEWAL LICENSED				
Job Created Date:	2018/02/27				
41	1 of 1	SW/259.3	1,079.7 / -0.17	City of Calgary Calgary AB	WSTE
Certificate NO:	255178-00-10			Approval Type:	Amendment
Status:	Operating			DLS:	NE-23-25-1-5
Status Date:	25-Jun-12			Lot:	
Effective Date:	25-Jun-12			Block:	
Expiry Date:				Plan:	
Facility Name:	Calgary Storm Drainage System				
Description:	Storm Drainage System				
Operator:					
Mailing Address:					
42	1 of 1	E/282.1	1,094.0 / 14.09	RUN DIGITAL #118 10707 25 ST NE AB	CBL
Comdistnm:	CALGARY INTERNATIONAL AIRPORT			City Quadrants:	4
Latitude:	51.1514332856793			Ward Boundaries:	11
Longitude:	-113.999362937807			Calgary Communities:	86
Location:	(51.1514332856793, -113.999362937807)				
<u>Licence Type Information</u>					
Licence Types:	MANUFACTURER				
Job Status:	PENDING RENEWAL				
Job Created Date:	2008/07/15				
43	1 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	GEN

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
AB					
Approval No: Record ID: Approval Year:	2009			DLS: Phone: 403-226-5897 Contact: Kham Lin	
43	2 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	GEN
Approval No: Record ID: Approval Year:	2010			DLS: Phone: 403-226-5897 Contact: Kham Lin	
43	3 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB T3J 5J9	GEN
Approval No: Record ID: Approval Year:				DLS: Phone: Contact:	
43	4 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	GEN
Approval No: Record ID: Approval Year:	May 2011-Apr 2012			DLS: Phone: Contact:	
43	5 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	GEN
Approval No: Record ID: Approval Year:	May 2012- Jan 2013			DLS: Phone: 403-226-5897 Contact: Kham Lin	
43	6 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9	GEN
Approval No: Record ID: Approval Year:	Feb 2013 - Sep 2013			DLS: Phone: 403-226-5897 Contact: Kham Lin	
43	7 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	GEN

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Approval No: Record ID: Approval Year: Feb 2015				DLS: Phone: 403-226-5897 Contact: Kham Lin	
43	8 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	GEN
Approval No: Record ID: Approval Year: Jan 2016				DLS: Phone: 403-226-5897 Contact: Kham Lin	
43	9 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies Incorporated Unit 105, 90 Freeport Blvd NE Calgary AB T3J 5J9 AB	GEN
Approval No: Record ID: Approval Year: Dec 2016; Apr 2017; Aug 2018				DLS: Phone: Contact: Kham Lin	
43	10 of 11	ESE/283.3	1,089.0 / 9.14	Can West Projects Inc. 202-90 Freeport Blvd NE Calgary AB T3J 5J9	SCT
Established: Plant Size (ft²): Employment:		01-FEB-78			
--Details-- Description: SIC/NAICS Code:		Services to Oil and Gas Extraction 213118			
43	11 of 11	ESE/283.3	1,089.0 / 9.14	K'(Prime) Technologies 105-90 Freeport Blvd NE Calgary AB T3J 5J9	SCT
Established: Plant Size (ft²): Employment:		01-JAN-97			
--Details-- Description: SIC/NAICS Code:		Wholesale Trade Agents and Brokers 419120			

Unplottable Summary

Total: **89** Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CHEM	One Man and a Ladybug Ltd.	Plan No. 9111941, Blk 3 Lot 49	Calgary AB	
ESAR	DEVELOPMENT PERMIT	Calgary N OF COVENTRY HILLS BLVD	AB	
ESAR	DEVELOPMENT PERMIT	Calgary N OF COVENTRY HILLS BLVD	AB	
FCON	Shell Canada Products - Head Office, Calgary		Calgary AB	
FCON	Shell Canada Products - Head Office, Calgary		Calgary AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M	Calgary AB	T2P 2H5
GEN	Shell Canada Products Limited	BOX 100 STN M	Calgary AB	
GEN	Shell Canada Products Limited	BOX 100 STN M	Calgary AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100	Calgary AB	T2P 2H5
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100	Calgary AB	T2P 2H5

GEN	Shell Canada Products Limited	BOX 100, STN M	Calgary AB	T2P 2H5
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Products Limited	BOX 100 STN M	Calgary AB	T2P 2H5
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 100 STN M	Calgary AB	T2P 2H5
GEN	Shell Canada Limited	BOX 100 STN M	Calgary AB	
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 100 STN M	Calgary AB	T2P 2H5
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 100, STATION 'M'	Calgary AB	T2P 2H5
GEN	Shell Canada Limited	BOX 100 STN M	Calgary AB	T2P 2H5
GEN	Shell Canada Limited	BOX 100, STATION 'M'	Calgary AB	T2P 2H5
GEN	Shell Canada Limited	BOX 2506	Calgary AB	T2P 3S6
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	Shell Canada Limited	BOX 2506	Calgary AB	T2P 3S6
GEN	Shell Canada Limited	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	SHELL CANADA PRODUCTS LIMITED	Box 100,Station M Calgary AB T2P 2H5	AB	
GEN	SHELL CANADA PRODUCTS LIMITED	P.O. Box 100 Calgary AB T2P 2H5	AB	
GEN	SHELL CANADA LIMITED	P.O. Box 100 Station M Calgary AB T2P 2H5	AB	

GEN	SHELL CANADA LIMITED	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	SHELL CANADA LIMITED	BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	SHELL CANADA LIMITED	P.O. Box 2929, Station M Calgary AB T2P 4V8	AB	
GEN	SHELL CANADA LIMITED	PO BOX 100 STN M Calgary AB T2P 2H5	AB	
GEN	SHELL CANADA LIMITED	P.O. Box 2506 Calgary AB T2P 3S6	AB	
GEN	Petro-Canada	BOX 2844	Calgary AB	T2P 3E3
GEN	Petro-Canada	BOX 2844	Calgary AB	T2P 3E3
GEN	PETRO-CANADA	P.O. Box 2844 Calgary AB T2P 3E3	AB	
GEN	PETRO-CANADA	CALGARY REFINERY BOX 2844	AB	
GEN	PETRO-CANADA	PO Box 2844, Room 2064 West Calgary AB T2P 3E3	AB	
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5	AB	
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16	Calgary AB	T2P 2G5
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5	AB	
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5	AB	
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5	AB	
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5	AB	
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16	Calgary AB	T2P 2G5
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16	Calgary AB	T2P 2G5
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16	Calgary AB	T2P 2G5
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16	Calgary AB	T2P 2G5
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16	Calgary AB	T2P 2G5
GEN	Ashe Aircraft Enterprises Ltd.	BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5	AB	
NPCB	PETRO-CANADA	P.O. Box 2844	Calgary AB	T2P 3E3

NPCB	PETRO-CANADA	P.O. Box 2844	Calgary AB	T2P 3E3
NPCB	SHELL CANADA LIMITED	Jumping Pound Complex P.O. Box 2929, Station "M"	Calgary AB	T2P 4V8
NPCB	PETRO-CANADA	P.O. Box 2844	Calgary AB	T2P 3E3
NPRI	SHELL CANADA	P.O. BOX STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
NPRI	SHELL CANADA	P.O. BOX 2929 STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
NPRI	SHELL CANADA	P.O. BOX 2929 STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
NPRI	SHELL CANADA	P.O. BOX STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
NPRI	SHELL CANADA	P.O. BOX STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
NPRI	SHELL CANADA	P.O. BOX STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
NPRI	SHELL CANADA	P.O. BOX 2929 STN. M NOT AVAILABLE	CALGARY AB	T2P4V8
PCG	Shell Canada Products Limited		Calgary AB	T2P 2H5
PCG	Petro-Canada		Calgary AB	T2P 3E3
RST	SHELL		CALGARY AB	
RST	BOW TRAIL SHELL SERVICE STATION		CALGARY AB	
RST	PETRO-CANADA	LUBRICANTS-CALGARY	CALGARY AB	T2P 3T6
RST	PETRO-CANADA	GASOLINE & DIESEL FUELS	CALGARY AB	T2P 3T6
RST	PETRO-CANADA CRANSTON		CALGARY AB	
RST	PETRO-CANADA ERIN WOODS		CALGARY AB	
RST	PETRO-CANADA INC		CALGARY AB	
SCT	Shell Canada Limited		Calgary AB	T2J 0N0
SCT	Helitrades Inc.	14 St NE	Calgary AB	T2E 6T7
SCT	Shell Canada Energy		Calgary AB	
SCT	Shell Canada Energy Limited		AB	

WSTE	Shell Canada Limited	Calgary AB	T2P 2H5
WSTE	Shell Canada Limited	Calgary AB	T2P 2H5

Unplottable Report

Site: *One Man and a Ladybug Ltd.*
Plan No. 9111941, Blk 3 Lot 49 Calgary AB

Database:
CHEM

Certificate NO: 155227-00-00 **Approval Type:** Initial
Status: Operating **DLS:**
Status Date: 31-Oct-01 **Lot:** 49
Effective Date: 31-Oct-01 **Block:** 3
Expiry Date: 31-Mar-09 **Plan:** 9111941
Description: Structural
Facility Name: PESTICIDE SERVICE REGISTRATION
Operator: ONE MAN AND A LADYBUG LTD.
Mailing Address: 327 COVENTRY CLOSE NE, Calgary, AB T3K 4C5

Site: *DEVLOPMENT PERMIT*
Calgary N OF COVENTRY HILLS BLVD AB

Database:
ESAR

ESA ID: 1344440
ESRD File: 108527
File Classification:
Name:
10tm Point Coordinate:
LLD:
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=1344440>
ESAR Link:

Site: *DEVLOPMENT PERMIT*
Calgary N OF COVENTRY HILLS BLVD AB

Database:
ESAR

ESA ID: 1344440
ESRD File: 96589
File Classification:
Name:
10tm Point Coordinate:
LLD:
LINC:
Map Link: <http://www.esar.alberta.ca/esarmap.aspx?esaid=1344440>
ESAR Link:

Site: *Shell Canada Products - Head Office, Calgary*
Calgary AB

Database:
FCON

Mailing Address:
Offence Date:
Offence: Benzene in Gasoline 3(1), 8(1)
Status: Closed
Offence Location: Calgary
Date Charged: 6/6/2002
Court Date: 12/20/2002
Penalty: Penalty: \$40,000; \$10,000. Fine \$5,000; \$3,000
Result:
Notes: Written court order directed \$35,000 to U of C Faculty Environmental Design. Written court order directed \$35,000 to U of C Faculty Environmental Design.

Site: *Shell Canada Products - Head Office, Calgary*

Database:
FCON

Calgary AB

Mailing Address:

Offence Date:

Offence: Fuels Information, No. 1 4(1)

Status: Closed

Offence Location: Calgary

Date Charged: 6/6/2002

Court Date: 12/20/2002

Penalty:

Result:

Notes:

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:

Record ID:

Approval Year: Jan 2016

DLS:

Phone:

Contact: 403-232-5601
Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:

Record ID:

Approval Year: Dec 2016; Apr 2017; Aug 2018

DLS:

Phone:

Contact: Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5

Database:
GEN

Approval No:

Record ID:

Approval Year: Feb 2013 - Sep 2013

DLS:

Phone:

Contact: 403-232-5601
Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB

Database:
GEN

Approval No:

Record ID:

Approval Year: May 2012- Jan 2013

DLS:

Phone:

Contact: 403-232-5601
Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB

Database:
GEN

Approval No:

Record ID:

Approval Year: May 2012- Jan 2013

DLS:

Phone:

Contact: 403-232-5601
Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:

Record ID:

Approval Year: Feb 2015

DLS:

Phone:

Contact: 403-232-5601
Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: May 2011-Apr 2012

DLS:
Phone:
Contact:

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2008/2009

DLS:
Phone: (403)232-5601
Contact: Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year:

DLS:
Phone:
Contact:

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year:

DLS:
Phone:
Contact:

Site: *Shell Canada Products Limited*
BOX 100 Calgary AB T2P 2H5

Database:
GEN

Approval No: ABG05188
Record ID: 692
Approval Year: 2000

DLS:
Phone:
Contact:

--Details--

Material Code: UN1325
Material Description: Flammable Solids, n.o.s.

Material Code: UN3175
Material Description: Solids containing flammable liquid, nos

Site: *Shell Canada Products Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2009

DLS:
Phone: (403)232-5601
Contact: Roman Lohin

Site: *Shell Canada Products Limited*
BOX 100 Calgary AB T2P 2H5

Database:
GEN

Approval No: ABG05188
Record ID: 271
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--

Material Code: UN1325
Material Description: Flammable Solids, n.o.s.

Site: Shell Canada Products Limited
BOX 100, STN M Calgary AB T2P 2H5 **Database:**
GEN

Approval No: ABG06257 **DLS:**
Record ID: 516 **Phone:**
Approval Year: 1999 **Contact:**

--Details--

Material Code: UN3175
Material Description: Solids containing flammable liquid, nos

Site: Shell Canada Products Limited
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: **DLS:**
Record ID: **Phone:** (403)232-5601
Approval Year: 2010 **Contact:** Roman Lohin

Site: Shell Canada Products Limited
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: **DLS:**
Record ID: **Phone:** (403)232-5601
Approval Year: 2008/2009 **Contact:** Roman Lohin

Site: Shell Canada Products Limited
BOX 100 STN M Calgary AB T2P 2H5 **Database:**
GEN

Approval No: **DLS:**
Record ID: **Phone:** (403) 216-5558
Approval Year: 2007/2008 **Contact:** Roman Lohin

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: **DLS:**
Record ID: **Phone:** (403)232-3214
Approval Year: 2010 **Contact:** Chris Clarke

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 **Database:**
GEN

Approval No: **DLS:**
Record ID: **Phone:** 403-232-3214
Approval Year: Feb 2013 - Sep 2013 **Contact:** Chris Clarke

Site: Shell Canada Limited
BOX 100 STN M Calgary AB **Database:**
GEN

Approval No: **DLS:**
Record ID: **Phone:** 403-232-3214
Approval Year: May 2012- Jan 2013 **Contact:** Chris Clarke

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No:
Record ID:
Approval Year:

DLS:
Phone:
Contact:

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2009

DLS:
Phone: (403)232-3214
Contact: Chris Clarke

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: Dec 2016; Apr 2017; Aug 2018

DLS:
Phone:
Contact: Chris Clarke

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2008/2009

DLS:
Phone: (403)232-3214
Contact: Chris Clarke

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5

Database:
GEN

Approval No: ABG04668
Record ID: 226
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--

Material Code: LA64
Material Description: Leachable Toxic Waste containing vinyl chloride

Material Code: UN2315
Material Description: Polychlorinated Biphenyls/PCB

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: May 2011-Apr 2012

DLS:
Phone:
Contact:

Site: Shell Canada Limited
BOX 100, STATION 'M' Calgary AB T2P 2H5

Database:
GEN

Approval No: ABG10512
Record ID: 687
Approval Year: 2000

DLS:
Phone:
Contact:

--Details--

Material Code: UN1993
Material Description: Flammable Liquids, n.o.s.

Material Code: UN3077

Material Description: Environmentally Hazardous sub., solid

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5

Database:
GEN

Approval No:
Record ID:
Approval Year: 2007/2008

DLS:
Phone: (403) 346-2711
Contact: Chris Clarke

Site: Shell Canada Limited
BOX 100, STATION 'M' Calgary AB T2P 2H5

Database:
GEN

Approval No: ABG10512
Record ID: 823
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--

Material Code: UN1993
Material Description: Flammable Liquids, n.o.s.

Material Code: UN3077
Material Description: Environmentally Hazardous sub., solid

Site: Shell Canada Limited
BOX 2506 Calgary AB T2P 3S6

Database:
GEN

Approval No: ABG03429
Record ID: 93
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--

Material Code: UN1953
Material Description: Compressed or liquified gases, flammable, toxic, n.o.s.

Material Code: UN1992
Material Description: Flammable Liquids, poisonous, n.o.s.

Material Code: UN1993
Material Description: Flammable Liquids, n.o.s.

Material Code: UN2809
Material Description: Mercury

Material Code: UN2810
Material Description: Poisonous Liquids, n.o.s.

Material Code: UN2811
Material Description: Poisonous Solids, n.o.s.

Material Code: UN3077
Material Description: Environmentally Hazardous sub., solid

Material Code: UN1202
Material Description: Fuel Oil or Fuel oil no. 1,2,4,5, or 6 or Gas oil

Material Code: UN1268
Material Description: Petroleum Distillates, n.o.s.

Material Code: UN1493
Material Description: Silver Nitrate

Material Code: UN1610

Material Description: Halogenated Irritating Liquids
Material Code: UN1759
Material Description: Corrosive Solids, n.o.s.
Material Code: UN1760
Material Description: Corrosive Liquids, n.o.s.
Material Code: UN1824
Material Description: Sodium hydroxide/Caustic soda, solution

Site: Shell Canada Limited
BOX 100 STN M Calgary AB T2P 2H5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: Jan 2016

DLS:
Phone: 403-232-3214
Contact: Chris Clarke

Site: Shell Canada Limited
BOX 2506 Calgary AB T2P 3S6

Database:
GEN

Approval No: ABG03429
Record ID: 688
Approval Year: 2000

DLS:
Phone:
Contact:

--Details--

Material Code: UN3175
Material Description: Solids containing flammable liquid, nos

Material Code: UN1385
Material Description: Sodium sulfide or Sodium sulfide anhydrous

Material Code: UN1479
Material Description: Oxidizing Substances, n.o.s. (Liquid or Solid)

Material Code: UN1436
Material Description: Zinc, powder or dust

Material Code: UN1760
Material Description: Corrosive Liquids, n.o.s.

Material Code: UN1950
Material Description: Aerosols

Material Code: UN2810
Material Description: Poisonous Liquids, n.o.s.

Material Code: UN1993
Material Description: Flammable Liquids, n.o.s.

Material Code: UN2315
Material Description: Polychlorinated Biphenyls/PCB

Material Code: UN2809
Material Description: Mercury

Material Code: UN2811
Material Description: Poisonous Solids, n.o.s.

Material Code: UN2846
Material Description: Pyrophoric Solids, n.o.s.

Material Code: UN3139
Material Description: Oxidizing liquid, n.o.s.

Material Code: UN1992
Material Description: Flammable Liquids, poisonous, n.o.s.

Site: *Shell Canada Limited*
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No:
Record ID:
Approval Year: Feb 2015

DLS:
Phone: 403-232-3214
Contact: Chris Clarke

Site: *SHELL CANADA PRODUCTS LIMITED*
Box 100,Station M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: ABG06257
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)691-2935
Contact: Roman Lohin

Site: *SHELL CANADA PRODUCTS LIMITED*
P.O. Box 100 Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: ABG05188
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)691-2732
Contact: Roman Lohin

Site: *SHELL CANADA LIMITED*
P.O. Box 100 Station M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: ABG02481
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)232-3214
Contact:

Site: *SHELL CANADA LIMITED*
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: ABG02831
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)992-3887
Contact: Walter Theuser

Site: *SHELL CANADA LIMITED*
BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: ABG05310
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)224-3525
Contact: (403)637-6000

Site: *SHELL CANADA LIMITED*
P.O. Box 2929, Station M Calgary AB T2P 4V8 AB **Database:**
GEN

Approval No: ABG03490
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)932-8216
Contact: Jim McEachern

Site: *SHELL CANADA LIMITED*
PO BOX 100 STN M Calgary AB T2P 2H5 AB **Database:**
GEN

Approval No: ABG04668 **DLS:**

Record ID:
Approval Year: 1993-1998

Phone: (403)691-4032
Contact: Richard Hart

Site: SHELL CANADA LIMITED
P.O. Box 2506 Calgary AB T2P 3S6 AB

Database:
GEN

Approval No: ABG03429
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)284-6535
Contact: Jeff Holland

Site: Petro-Canada
BOX 2844 Calgary AB T2P 3E3

Database:
GEN

Approval No: ABG8679
Record ID: 922
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--

Material Code: UN1719
Material Description: Caustic Alkalis Liquids, n.o.s.

Site: Petro-Canada
BOX 2844 Calgary AB T2P 3E3

Database:
GEN

Approval No: ABG05192
Record ID: 275
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--

Material Code: UN3082
Material Description: Environmentally Hazardous sub., liquid

Material Code: UN1760
Material Description: Corrosive Liquids, n.o.s.

Material Code: UN2315
Material Description: Polychlorinated Biphenyls/PCB

Material Code: UN1610
Material Description: Halogenated Irritating Liquids

Site: PETRO-CANADA
P.O. Box 2844 Calgary AB T2P 3E3 AB

Database:
GEN

Approval No: ABG04035
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)296-6568
Contact: Laurie McCann

Site: PETRO-CANADA
CALGARY REFINERY BOX 2844 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2006

DLS:
Phone:
Contact:

--Details--

Material Code: 3.00
Material Description: Flammable Liquids

Material Code: 4.1
Material Description: Readily Ignitable

Material Code: 5.1
Material Description: Contributes to Combustion

Material Code: 6.1
Material Description: Poisonous by Inhaling/Contact/Ingestion

Material Code: 6.1
Material Description: Poisonous by Inhaling/Contact/Ingestion

Material Code: 8
Material Description: Corrosive Substances

Material Code: 8
Material Description: Corrosive Substances

Material Code: 9
Material Description: Miscellaneous Dangerous Goods

Site: **PETRO-CANADA**
PO Box 2844, Room 2064 West Calgary AB T2P 3E3 AB

Database:
GEN

Approval No: ABG05192
Record ID:
Approval Year: 1993-1998

DLS:
Phone: (403)296-7770
Contact: Tim Taylor

Site: **Ashe Aircraft Enterprises Ltd.**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2008/2009

DLS:
Phone: (403)288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5

Database:
GEN

Approval No: ABG06614
Record ID: 77
Approval Year: 2000

DLS:
Phone:
Contact:

--Details--

Material Code: UN1863
Material Description: Fuel, aviation, turbine engine

Material Code: UN1263
Material Description: Paint or Paint related material

Site: **Ashe Aircraft Enterprises Ltd.**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2009

DLS:
Phone: (403)288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: Feb 2015

DLS:
Phone: 403-288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB **GEN**

Approval No:
Record ID:
Approval Year: May 2011-Apr 2012

DLS:
Phone:
Contact:

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB **GEN**

Approval No:
Record ID:
Approval Year:

DLS:
Phone: (403)288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB **GEN**

Approval No:
Record ID:
Approval Year: Jan 2016

DLS:
Phone: 403-288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 **GEN**

Approval No:
Record ID:
Approval Year: Feb 2013 - Sep 2013

DLS:
Phone: 403-288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 **GEN**

Approval No: ABG06614
Record ID: 612
Approval Year: 1999

DLS:
Phone:
Contact:

--Details--
Material Code: UN1263
Material Description: Paint or Paint related material

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB **GEN**

Approval No:
Record ID:
Approval Year: May 2012- Jan 2013

DLS:
Phone: 403-288-3305
Contact: Andrew Cook

Site: **Ashe Aircraft Enterprises Ltd.** **Database:**
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 **GEN**

Approval No:
Record ID:
Approval Year: 2007/2008

DLS:
Phone: (403) 288-3305
Contact: Andrew Cook

Site: Ashe Aircraft Enterprises Ltd.
BOX 27 RR 2 SITE 16 Calgary AB T2P 2G5 AB

Database:
GEN

Approval No:
Record ID:
Approval Year: 2010

DLS:
Phone: (403)288-3305
Contact: Andrew Cook

Site: PETRO-CANADA
P.O. Box 2844 Calgary AB T2P 3E3

Database:
NPCB

Company Code: T0150SL
Industry: Petroleum
Site Status:
Transaction Date: 1/6/1997
Inspection Date:

--Details--

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 10.40 L

Site: PETRO-CANADA
P.O. Box 2844 Calgary AB T2P 3E3

Database:
NPCB

Company Code: T0150SSL
Industry: Petroleum
Site Status:
Transaction Date: 1/6/1997
Inspection Date:

--Details--

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 0.20 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 3.25 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:

No. of Items:
Manufacturer:
Status: in-use
Contents: 6.20 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 6.50 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 9.40 L

Site: SHELL CANADA LIMITED
Jumping Pound Complex P.O. Box 2929, Station "M" Calgary AB T2P 4V8

Database:
NPCB

Company Code: T0173JPC
Industry: Petroleum
Site Status:
Transaction Date: 3/25/1997
Inspection Date:

--Details--

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: treated / in-use
Contents: 790.00 L

Site: PETRO-CANADA
P.O. Box 2844 Calgary AB T2P 3E3

Database:
NPCB

Company Code: T0150GA
Industry: Petroleum
Site Status:
Transaction Date: 1/6/1997
Inspection Date:

--Details--

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 0.50 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 1.00 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 2.40 L

Site: SHELL CANADA
P.O. BOX STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
NPRI

NPRI ID: 19826
Other ID: N
No Other ID:
Track ID: 35319
Report ID: 96148
Report Type: NPRI
Rpt Type ID: 1
Report Year: 2005
Not-Current Rpt?: No
Yr of Last Filed Rpt: 2008
Fac ID: 191331
Fac Name: JUMPING POUND 5-10 WELL SITE
COMPRESSOR
Fac Address1: P.O. BOX STN. M
Fac Address2: NOT AVAILABLE
Fac Postal Zip: T2P4V8
Facility Lat: 0
Facility Long: 0
DLS (Last Filed Rpt):
Facility DLS:
Datum: 1983
Facility Cmnts: False
URL:
No of Empl.: 1
Parent Co.: N
No Parent Co.:
Pollut Prev Cmnts: False
Stacks: False
No of Stacks:
Canadian SIC Code (2 digit):
Canadian SIC Code:
SIC Code Description:
American SIC Code:
NAICS Code (2 digit): 21
NAICS 2 Description: Mining and Oil and Gas Extraction
NAICS Code (4 digit): 2111
NAICS 4 Description: Oil and gas extraction
NAICS Code (6 digit): 211113
NAICS 6 Description: Conventional oil and gas extraction

Org ID: 65961
Submit Date: 5/24/2006
Last Modified: 5/29/2015 3:28:24 PM
Contact ID: 170850
Cont Type: MED
Contact Title:
Cont First Name: JONATHAN
Cont Last Name: PROUD
Contact Position: ENVIRONMENTAL COORDINATOR
Contact Fax:
Contact Ph.: 4039328230
Cont Area Code: 403
Contact Tel.: 39328230
Contact Ext.:
Cont Fax Area Cde:
Contact Fax:
Contact Email: JONATHAN.PROUD@SHELL.COM
Latitude: 0
Longitude: 0
UTM Zone:
UTM Northing:
UTM Easting:
Waste Streams: False
No Streams:
Waste Off Sites: False
No Off Sites:
Shutdown:
No of Shutdown:

Substance Release Report

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: Nitrogen oxides (expressed as NO2)
Chem (fr): Oxydes d'azote (exprimés en NO2)
Quantity: 11
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

Site: SHELL CANADA
 P.O. BOX 2929 STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
 NPRI

NPRI ID:	19827	Org ID:	65961
Other ID:	N	Submit Date:	5/28/2007
No Other ID:		Last Modified:	5/29/2015 3:28:24 PM
Track ID:	44711	Contact ID:	170850
Report ID:	104400	Cont Type:	MED
Report Type:	NPRI	Contact Title:	
Rpt Type ID:	1	Cont First Name:	JONATHAN
Report Year:	2006	Cont Last Name:	PROUD
Not-Current Rpt?:	No	Contact Position:	ENVIRONMENTAL COORDINATOR
Yr of Last Filed Rpt:	2007	Contact Fax:	
Fac ID:	191335	Contact Ph.:	4039328230
Fac Name:	JUMPING POUND 14-32 WELL SITE COMPRESSOR	Cont Area Code:	403
Fac Address1:	P.O. BOX 2929 STN. M	Contact Tel.:	39328230
Fac Address2:	NOT AVAILABLE	Contact Ext.:	
Fac Postal Zip:	T2P4V8	Cont Fax Area Cde:	
Facility Lat:	0	Contact Fax:	
Facility Long:	0	Contact Email:	JONATHAN.PROUD@SHELL.COM
DLS (Last Filed Rpt):		Latitude:	0
Facility DLS:		Longitude:	0
Datum:	1983	UTM Zone:	
Facility Cmnts:	False	UTM Northing:	
URL:		UTM Easting:	
No of Empl.:	1	Waste Streams:	True?
Parent Co.:	N	No Streams:	
No Parent Co.:		Waste Off Sites:	False
Pollut Prev Cmnts:	False	No Off Sites:	
Stacks:	True	Shutdown:	
No of Stacks:		No of Shutdown:	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	21		
NAICS 2 Description:	Mining and Oil and Gas Extraction		
NAICS Code (4 digit):	2111		
NAICS 4 Description:	Oil and gas extraction		
NAICS Code (6 digit):	211113		
NAICS 6 Description:	Conventional oil and gas extraction		

Substance Release Report

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: Nitrogen oxides (expressed as NO2)
Chem (fr): Oxydes d'azote (exprimés en NO2)
Quantity: 28
Unit: tonnes
Basis of Estimate Cd: E2

Site: SHELL CANADA
P.O. BOX 2929 STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
NPRI

NPRI ID:	19827	Org ID:	65961
Other ID:	N	Submit Date:	5/24/2006
No Other ID:		Last Modified:	5/29/2015 3:28:24 PM
Track ID:	35327	Contact ID:	170850
Report ID:	96198	Cont Type:	MED
Report Type:	NPRI	Contact Title:	
Rpt Type ID:	1	Cont First Name:	JONATHAN
Report Year:	2005	Cont Last Name:	PROUD
Not-Current Rpt?:	No	Contact Position:	ENVIRONMENTAL COORDINATOR
Yr of Last Filed Rpt:	2007	Contact Fax:	
Fac ID:	191335	Contact Ph.:	4039328230
Fac Name:	JUMPING POUND 14-32 WELL SITE COMPRESSOR	Cont Area Code:	403
Fac Address1:	P.O. BOX 2929 STN. M	Contact Tel.:	39328230
Fac Address2:	NOT AVAILABLE	Contact Ext.:	
Fac Postal Zip:	T2P4V8	Cont Fax Area Cde:	
Facility Lat:	0	Contact Fax:	
Facility Long:	0	Contact Email:	JONATHAN.PROUD@SHELL.COM
DLS (Last Filed Rpt):		Latitude:	0
Facility DLS:		Longitude:	0
Datum:	1983	UTM Zone:	
Facility Cmnts:	False	UTM Northing:	
URL:		UTM Easting:	
No of Empl.:	1	Waste Streams:	False
Parent Co.:	N	No Streams:	
No Parent Co.:		Waste Off Sites:	False
Pollut Prev Cmnts:	False	No Off Sites:	
Stacks:	False	Shutdown:	
No of Stacks:		No of Shutdown:	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	21		
NAICS 2 Description:	Mining and Oil and Gas Extraction		
NAICS Code (4 digit):	2111		
NAICS 4 Description:	Oil and gas extraction		
NAICS Code (6 digit):	211113		
NAICS 6 Description:	Conventional oil and gas extraction		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	23
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Site: SHELL CANADA
P.O. BOX STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
NPRI

NPRI ID:	19826	Org ID:	65961
Other ID:	N	Submit Date:	5/28/2008
No Other ID:		Last Modified:	5/29/2015 3:28:24 PM
Track ID:	54910	Contact ID:	170850
Report ID:	119352	Cont Type:	MED

Report Type: NPRI
Rpt Type ID: 1
Report Year: 2007
Not-Current Rpt?: No
Yr of Last Filed Rpt: 2008
Fac ID: 191331
Fac Name: JUMPING POUND 5-10 WELL SITE
 COMPRESSOR
Fac Address1: P.O. BOX STN. M
Fac Address2: NOT AVAILABLE
Fac Postal Zip: T2P4V8
Facility Lat: 0
Facility Long: 0
DLS (Last Filed Rpt):
Facility DLS:
Datum: 1983
Facility Cmnts: False
URL:
No of Empl.: 1
Parent Co.: N
No Parent Co.:
Pollut Prev Cmnts: False
Stacks: True
No of Stacks:
Canadian SIC Code (2 digit):
Canadian SIC Code:
SIC Code Description:
American SIC Code:
NAICS Code (2 digit): 21
NAICS 2 Description: Mining, quarrying, and oil and gas extraction
NAICS Code (4 digit): 2111
NAICS 4 Description: Oil and gas extraction
NAICS Code (6 digit): 211113
NAICS 6 Description: Conventional oil and gas extraction

Contact Title:
Cont First Name: JONATHAN
Cont Last Name: PROUD
Contact Position: ENVIRONMENTAL COORDINATOR
Contact Fax:
Contact Ph.: 4039328230
Cont Area Code: 403

Contact Tel.: 39328230
Contact Ext.:
Cont Fax Area Cde:
Contact Fax:
Contact Email: JONATHAN.PROUD@SHELL.COM
Latitude: 0
Longitude: 0
UTM Zone:
UTM Northing:
UTM Easting:
Waste Streams: True?
No Streams:
Waste Off Sites: True?
No Off Sites:
Shutdown:
No of Shutdown:

Substance Release Report

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: Nitrogen oxides (expressed as NO2)
Chem (fr): Oxydes d'azote (exprimés en NO2)
Quantity: 11.1
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

Site: SHELL CANADA
 P.O. BOX STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
 NPRI

NPRI ID: 19826
Other ID: *
No Other ID:
Track ID: 63522
Report ID: 125520
Report Type: DNMC
Rpt Type ID: 2
Report Year: 2008
Not-Current Rpt?: No
Yr of Last Filed Rpt: 2008
Fac ID: 191331
Fac Name: JUMPING POUND 5-10 WELL SITE
 COMPRESSOR
Fac Address1: P.O. BOX STN. M
Fac Address2: NOT AVAILABLE

Org ID: 65961
Submit Date: 5/22/2009
Last Modified: 5/29/2015 3:28:24 PM
Contact ID:
Cont Type:
Contact Title:
Cont First Name:
Cont Last Name:
Contact Position:
Contact Fax:
Contact Ph.:
Cont Area Code:

Contact Tel.:
Contact Ext.:

Fac Postal Zip:	T2P4V8	Cont Fax Area Cde:	
Facility Lat:	0	Contact Fax:	
Facility Long:	0	Contact Email:	
DLS (Last Filed Rpt):		Latitude:	0
Facility DLS:		Longitude:	0
Datum:	1983	UTM Zone:	
Facility Cmnts:	No	UTM Northing:	
URL:		UTM Easting:	
No of Empl.:	0	Waste Streams:	No
Parent Co.:	*	No Streams:	
No Parent Co.:		Waste Off Sites:	No
Pollut Prev Cmnts:	No	No Off Sites:	
Stacks:	No	Shutdown:	No
No of Stacks:		No of Shutdown:	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	21		
NAICS 2 Description:	Mining, quarrying, and oil and gas extraction		
NAICS Code (4 digit):	2111		
NAICS 4 Description:	Oil and gas extraction		
NAICS Code (6 digit):	211113		
NAICS 6 Description:	Conventional oil and gas extraction		

Site: SHELL CANADA
P.O. BOX STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
NPRI

NPRI ID:	19826	Org ID:	65961
Other ID:	N	Submit Date:	5/28/2007
No Other ID:		Last Modified:	5/29/2015 3:28:24 PM
Track ID:	44710	Contact ID:	170850
Report ID:	104399	Cont Type:	MED
Report Type:	NPRI	Contact Title:	
Rpt Type ID:	1	Cont First Name:	JONATHAN
Report Year:	2006	Cont Last Name:	PROUD
Not-Current Rpt?:	No	Contact Position:	ENVIRONMENTAL COORDINATOR
Yr of Last Filed Rpt:	2008	Contact Fax:	
Fac ID:	191331	Contact Ph.:	4039328230
Fac Name:	JUMPING POUND 5-10 WELL SITE COMPRESSOR	Cont Area Code:	403
Fac Address1:	P.O. BOX STN. M	Contact Tel.:	39328230
Fac Address2:	NOT AVAILABLE	Contact Ext.:	
Fac Postal Zip:	T2P4V8	Cont Fax Area Cde:	
Facility Lat:	0	Contact Fax:	
Facility Long:	0	Contact Email:	JONATHAN.PROUD@SHELL.COM
DLS (Last Filed Rpt):		Latitude:	0
Facility DLS:		Longitude:	0
Datum:	1983	UTM Zone:	
Facility Cmnts:	False	UTM Northing:	
URL:		UTM Easting:	
No of Empl.:	1	Waste Streams:	True?
Parent Co.:	N	No Streams:	
No Parent Co.:		Waste Off Sites:	False
Pollut Prev Cmnts:	False	No Off Sites:	
Stacks:	True	Shutdown:	
No of Stacks:		No of Shutdown:	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	21		
NAICS 2 Description:	Mining and Oil and Gas Extraction		
NAICS Code (4 digit):	2111		
NAICS 4 Description:	Oil and gas extraction		
NAICS Code (6 digit):	211113		
NAICS 6 Description:	Conventional oil and gas extraction		

Substance Release Report

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: Nitrogen oxides (expressed as NO2)
Chem (fr): Oxydes d'azote (exprimés en NO2)
Quantity: 11
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

Site: SHELL CANADA
P.O. BOX 2929 STN. M NOT AVAILABLE CALGARY AB T2P4V8

Database:
NPRI

NPRI ID:	19827	Org ID:	65961
Other ID:	*	Submit Date:	5/22/2009
No Other ID:		Last Modified:	5/29/2015 3:28:24 PM
Track ID:	63414	Contact ID:	
Report ID:	122037	Cont Type:	
Report Type:	DNMC	Contact Title:	
Rpt Type ID:	2	Cont First Name:	
Report Year:	2007	Cont Last Name:	
Not-Current Rpt?:	No	Contact Position:	
Yr of Last Filed Rpt:	2007	Contact Fax:	
Fac ID:	191335	Contact Ph.:	
Fac Name:	JUMPING POUND 14-32 WELL SITE COMPRESSOR	Cont Area Code:	
Fac Address1:	P.O. BOX 2929 STN. M	Contact Tel.:	
Fac Address2:	NOT AVAILABLE	Contact Ext.:	
Fac Postal Zip:	T2P4V8	Cont Fax Area Cde:	
Facility Lat:	0	Contact Fax:	
Facility Long:	0	Contact Email:	
DLS (Last Filed Rpt):		Latitude:	0
Facility DLS:		Longitude:	0
Datum:	1983	UTM Zone:	
Facility Cmnts:	No	UTM Northing:	
URL:		UTM Easting:	
No of Empl.:	0	Waste Streams:	No
Parent Co.:	*	No Streams:	
No Parent Co.:		Waste Off Sites:	No
Pollut Prev Cmnts:	No	No Off Sites:	
Stacks:	No	Shutdown:	No
No of Stacks:		No of Shutdown:	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	21		
NAICS 2 Description:	Mining, quarrying, and oil and gas extraction		
NAICS Code (4 digit):	2111		
NAICS 4 Description:	Oil and gas extraction		
NAICS Code (6 digit):	211113		
NAICS 6 Description:	Conventional oil and gas extraction		

Site: Shell Canada Products Limited
Calgary AB T2P 2H5

Database:
PCG

Certificate NO:	00010327 01 00	Approval Type:	
Status:	Operating	DLS:	
Status Date:	09/01/1993 00:00:00	Lot:	
Effective Date:	05/13/1996 00:00:00	Block:	M
Expiry Date:	04/30/2006 00:00:00	Plan:	1669EE
Facility Name:	CALGARY/PETROCHEMICALS/SHELL CANADA PRODUCTS		
Description:	Lubricating Oils and Greases		

Operator:
Mailing Address: BOX 100 STN M, Calgary, AB, T2P 2H5

Site: **Petro-Canada**
Calgary AB T2P 3E3

Database:
PCG

Certificate NO: 00011229 01 00
Status: Operating
Status Date: 09/01/1993 00:00:00
Effective Date: 05/26/1998 00:00:00
Expiry Date: 05/01/2008 00:00:00
Facility Name: CALGARY/O&G/PETRO-CANADA
Description: Gas Plant (Data Conversion)
Operator:
Mailing Address: BOX 2844, Calgary, AB, T2P 3E3

Approval Type:
DLS: -24-1-5
Lot:
Block:
Plan:

Site: **SHELL**
CALGARY AB

Database:
RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4032321239
List Name:
Description:

Site: **BOW TRAIL SHELL SERVICE STATION**
CALGARY AB

Database:
RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4032462650
List Name:
Description:

Site: **PETRO-CANADA**
LUBRICANTS-CALGARY CALGARY AB T2P 3T6

Database:
RST

Headcode: 1186800
Headcode Desc: Service Stations-Gasoline, Oil & Natural Gas
Phone: 4032151449
List Name:
Description:

Site: **PETRO-CANADA**
GASOLINE & DIESEL FUELS CALGARY AB T2P 3T6

Database:
RST

Headcode: 1186800
Headcode Desc: Service Stations-Gasoline, Oil & Natural Gas
Phone: 4032151445
List Name:
Description:

Site: **PETRO-CANADA CRANSTON**
CALGARY AB

Database:
RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4032577609
List Name:

Description:

Site: **PETRO-CANADA ERIN WOODS**
CALGARY AB

Database:
RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4032486649
List Name:
Description:

Site: **PETRO-CANADA INC**
CALGARY AB

Database:
RST

Headcode: 01186800
Headcode Desc: SERVICE STATIONS GASOLINE OIL & NATURAL
Phone: 4035324748
List Name:
Description:

Site: **Shell Canada Limited**
Calgary AB T2J 0N0

Database:
SCT

Established: 1952
Plant Size (ft²):
Employment: 80

--Details--

Description: Petroleum Refineries
SIC/NAICS Code: 324110

Description: All Other Basic Inorganic Chemical Manufacturing
SIC/NAICS Code: 325189

Site: **Helitrades Inc.**
14 St NE Calgary AB T2E 6T7

Database:
SCT

Established: 1996
Plant Size (ft²):
Employment: 5

--Details--

Description: Aerospace Product and Parts Manufacturing
SIC/NAICS Code: 336410

Site: **Shell Canada Energy**
Calgary AB

Database:
SCT

Established: 1952
Plant Size (ft²):
Employment:

--Details--

Description: Petroleum Refineries
SIC/NAICS Code: 324110

Description: All Other Basic Inorganic Chemical Manufacturing
SIC/NAICS Code: 325189

Site: Shell Canada Energy Limited
AB

Database:
SCT

Established: 1/1/1952
Plant Size (ft²):
Employment:

--Details--

Description: All Other Basic Inorganic Chemical Manufacturing
SIC/NAICS Code: 325189

Description: Petroleum Refineries
SIC/NAICS Code: 324110

Site: Shell Canada Limited
Calgary AB T2P 2H5

Database:
WSTE

Certificate NO: 00075469 00 00
Status: Operating
Status Date: 3/5/85
Effective Date: 7/27/99
Expiry Date:
Facility Name: PEACE RIVER OIL PRODUCTION SITE
Description: Chemical use potable
Operator: Shell Canada Limited
Mailing Address: BOX 100 STN M, Calgary, AB, T2P 2H5

Approval Type:
DLS: 21-85-18-5
Lot:
Block:
Plan:

Site: Shell Canada Limited
Calgary AB T2P 2H5

Database:
WSTE

Certificate NO: 00049292 02 00
Status: Operating
Status Date: 3/5/85
Effective Date: 6/16/92
Expiry Date:
Facility Name: PEACE RIVER OIL PRODUCTION SITE
Description: Chemical use non-potable
Operator: Shell Canada Limited
Mailing Address: BOX 100 STN M, Calgary, AB, T2P 2H5

Approval Type:
DLS: 21-85-18-5
Lot:
Block:
Plan:

Appendix: Database Descriptions

*Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. **Note:** Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Well Licenses:

Provincial [AERW](#)

Locations of Well Licenses made available by the Alberta Energy Regulator (AER) as ST37. Includes Active, Suspended, Abandoned, Drilled and Cased Oil, Gas, Crude Bitumen well licenses, as well as Observation, Injection, Disposal, and Undefined well licences.

Government Publication Date: Sep 30, 2018

Agriculture and Fisheries - Certificates of Approval:

Provincial [AGR](#)

This database contains approvals for processes pertaining to drying of alfalfa/forage/peat, feedlots, fish farms and feed/seed mills. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Alberta Oil and Gas Wells:

Provincial [AOGW](#)

The Alberta Energy Utilities Board - now the Alberta Energy Regulator (AER) - maintained a database of oil and gas wells drilled in the province of Alberta. The database contains information on well name, licensee name, license number, location, status, total well depth and date of final drilling. Please note that this database will not be updated, information on wells drilled after September 2003 can be found in the Oil and Gas Wells (OGW) database under the 'Private Source Database' section.

Government Publication Date: 1883-Sept 2003*

Automobile Wrecking & Supplies:

Private [AUWR](#)

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Jan 31, 2019

Waste Management Facilities - Certificates of Approval:

Provincial [CAWD](#)

This database contains approvals for processes pertaining to waste management facilities (hazardous waste manifesting, waste disposal/incineration/open burning/processing/storage/treatment). Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993 - Jul 2018

Commercial Activity Risk:

Provincial [CBL](#)

List of locations with Business Licences for the follow commercial activities: apartment building with 4 or more stories, auto-body shop, fabric cleaning, manufacturing, motor vehicle dealerships and service/repair, and salvage yard/auto wrecking. Data made available by the City of Calgary.

Government Publication Date: Apr 30, 2019

Dry Cleaning Facilities:

Federal [CDRY](#)

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2017

Confined Feeding Operations:

Provincial CFO

In 1991, the Natural Resources Conservation Board (NRCB) was created to review applications for approval of major natural resource development projects in Alberta. In January 2002, the NRCB was given the responsibility to regulate the Confined Feeding Operation industry. The Agricultural Operation Practices Act defines a confined feeding operation to be: "an activity on land that is fenced or enclosed or within buildings where livestock are confined for the purpose of growing, sustaining, finishing or breeding by means other than grazing, but does not include seasonal feeding and bedding sites." Under the AOPA regulations, all new or expanding confined feeding operations (CFOs) or manure storage facilities are required to make an application for Approval, Registration or Authorization to the NRCB before construction or expansion commences. Geographic coordinates were provided in DLS (Dominion Land Survey) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the Quarter section only.

Government Publication Date: 2002-Jan 2019

Chemical Processing Operations - Certificates of Approval:

Provincial CHEM

This database contains approvals for processes pertaining to the manufacturing and use of chemical products and pesticides. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Compressed Natural Gas Stations:

Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 - Mar 2019

Compliance and Convictions:

Provincial CONV

This database summarizes the penalties and convictions handed down by the Alberta courts. This database identifies companies and/or individuals that have been found guilty of environmental offenses under Alberta's Environmental Protection Legislation. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Unfortunately, from state of the data, the location that the address pertains to cannot be confirmed.

Government Publication Date: 1993-Dec 2018

Fuel Sales and Storage:

Provincial CTNK

List of locations with Business Licences for fuel sales and storage. Data made available by the City of Calgary.

Government Publication Date: Jun 30, 2019

Enforcement Action Summary:

Provincial EAS

This database maintained by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB) - summarizes high risk enforcement action 1, high risk enforcement action 2 (persistent noncompliance), high risk enforcement action 3 (failure to comply or demonstrated disregard), low risk enforcement action - global REFER and legislative/regulatory enforcement action. Fields will include licensee/company name, non-compliance event, date of enforcement, location, etc.

Government Publication Date: 2007-Jan 2019

Environmental Effects Monitoring:

Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches:

Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Apr 30, 2019

Environmental Issues Inventory System:

Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Alberta Environment & Parks Storage Tanks:

Provincial

[EPST](#)

List of storage tanks under the purview of Alberta Environment and Parks.

Government Publication Date: Jul 31, 2016

Environment Protection & Enhancement Act and Water Act Public Notices:

Provincial

[EPWN](#)

A list of Public Notices of Applications, Decisions, and Revisions pertaining to applications made to Alberta Environment and Parks under the Water Act (WA) and Alberta Environment Protection and Enhancement Act (EPEA). Dominion Land Survey (DLS) locations provided by the source are subject to accuracy limitations inherent to the DLS system.

Government Publication Date: Jan 31, 2019

Environmental Site Assessment Repository:

Provincial

[ESAR](#)

Environmental site assessments determine the quality of soil and groundwater of a site, particularly at retail gas stations and other commercial and industrial sites. A site assessment does not necessarily mean a site is, or ever was, contaminated. Alberta's Environmental Site Assessment Repository (ESAR) is an online, searchable database that provides scientific and technical information about assessed and/or reclaimed sites throughout Alberta. Search Alberta's ESAR using meridian, range, township, and section values at <http://www.esar.alberta.ca/esarmain.aspx> to gain access to reclamation certificates and/or associated files (applications, reports).

Government Publication Date: 1960-Apr 2019

Facility List:

Provincial

[FAC](#)

This database contains a complete list of new, active and suspended facilities in Alberta including batteries, gas plants, meter stations, and other facilities. Information provided includes: facility id, facility name, operator name, sub type description, location, facility license no, and operational status; now includes EDCT (Energy Development Category Type) type and description. Made available by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB).

Government Publication Date: Up to Jun 30, 2019

Federal Convictions:

Federal

[FCON](#)

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land:

Federal

[FCS](#)

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

Government Publication Date: Jun 2000-May 2019

AER Incidents & Spills:

Provincial

[FIS](#)

Received from the Alberta Energy Regulator (AER) - formerly the ERCB (Energy Resources Conservation Board) and EUB (Energy Utilities Board) - this database, which used to be called EISL (Environmental Information System Listing), contains reported environmental incidents beginning in 1975. Descriptions include noise infractions, air quality emissions, oil spills and failures for pipelines, wells, plants, and batteries. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1975-Jun 2019

Food Processing Operations - Certificates of Approval:

Provincial

[FOOD](#)

This database contains approvals for processes pertaining to the manufacturing of food products. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

PTMAA Fuel Storage Tanks:

Provincial

[FST](#)

List of active tank sites, sites with tanks temporarily out of service, and sites at which tanks have been removed from the ground. Information in this database was collected according to Alberta Regulation AR 291/95 Storage Tank System Management and to AR 52/98 Fire Code which was formerly the Alberta Fire Code Regulation, 1992 (AR 204/92). This information was received from the Petroleum Tank Management Association of Alberta (PTMAA) which has regulated Storage Tanks since 1994.

Government Publication Date: 1985-May 2019

Waste Generators Summary:

Provincial [GEN](#)

Under Alberta's Waste Control Regulation, Alta. Reg. 192/96, a generator is a person who consigns hazardous waste for storage, transport, treatment or disposal. As of 2007, Alberta Environment no longer provides detailed information on each waste generator, such as approval number, class, and class description.

Government Publication Date: 1993-Aug 2018

Greenhouse Gas Emissions from Large Facilities:

Federal [GHG](#)

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO₂ eq).

Government Publication Date: 2013-Dec 2017

Gas Processing Plants:

Provincial [GPP](#)

The Alberta Energy Regulator (AER) - formerly the ERCB (Energy Resources Conservation Board) - has an inventory of all Gas Processing Plants in Alberta, with information such as location, names of plant, facility type, operator name, facility license, design capacities, etc.

Government Publication Date: Oct 2016-Oct 31, 2018

Alberta Environment's H.E.L.P. (Help End Landfill Pollution) Program Database:

Provincial [HELP](#)

The H.E.L.P. Data Tracking and Management Control System was created to provide tracking and management capabilities of industrial landfills in Alberta for the Department of Environment. Detailed information including company name, location, type of landfill, priority, score, status, use and much more is included in this database.

Government Publication Date: June 1988*

Horizontal Wells:

Provincial [HORW](#)

Defined as drilling directionally at a wellbore inclination angle exceeding 85 degrees, horizontal drilling can help increase resource recovery while minimizing surface impact. Recent improvements in the technology have made it possible to combine horizontal drilling with hydraulic fracturing to help coax oil and natural gas out of tight rock. Today, more than half of western Canada's wells are being drilled horizontally. Data includes: well locations (LE,LS,SE,TWP,RG,M,E), licence numbers, well names, Business Associate (BA) codes, licensee abbreviations, spud dates, final drilling dates, total depth, true vertical depth, and last updated dates. Made available by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB).

Government Publication Date: Mar 2015-Feb 28, 2019

Indian & Northern Affairs Fuel Tanks:

Federal [IAFT](#)

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Identification and Verification of Active and Inactive Land Disposal Sites:

Provincial [LDS](#)

In late 1981, Environment Canada and Alberta Environment initiated a project to identify and verify land disposal sites in the province of Alberta. A point scoring system was used to classify the sites into potential priority 1, priority 2 or priority 3 groups on the basis of the type of waste received at the sites and the site environment. Sites that, according to available information, may pose a hazard to public health and safety or the environment are classified as potential priority 1 sites.

Government Publication Date: Oct 1982*

Land Disposal Sites on Indian Reserves:

Provincial [LDSI](#)

In late 1981, Environment Canada and Alberta Environment initiated a project to identify and verify land disposal sites in the province of Alberta. This database specifically identifies land disposal sites on Indian Reserves. Information on each site is limited to: location, band, size and general comments.

Government Publication Date: Oct 1982*

Lumber Related Operations - Certificates of Approval:

Provincial [LUM](#)

This database contains approvals for processes pertaining to the manufacturing of wood products, pulp and paper including the associated water treatment processes. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Canadian Mine Locations:

Private

MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Metals, Minerals and Building Materials Operations - Certificates of Approval:

Provincial

MMB

This database contains approvals for processes pertaining to the manufacturing of building materials, metals, and mineral products. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Mineral Occurrences:

Provincial

MNR

The AMDO (Alberta Mineral Deposits and Occurrences) application was created by the Minerals and Coal Geoscience Section of the Alberta Geological Survey as a database for mineral deposits in Alberta in the early 1990s. This is a one time inventory and will not be updated.

Government Publication Date: 1993-2003*

National Analysis of Trends in Emergencies System (NATES):

Federal

NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

PTMAA Non-Compliant Storage Tanks:

Provincial

NCST

The Alberta Fire Code requires that storage tanks be registered. Tanks may not be registered because they do not meet minimum equipment standards or the owners have not made the annual registration application or paid the necessary registration fees. Some tank owners have installed tanks without a permit. This source contains information on facilities which have tanks that have ceased to be registered or have never been registered. It is maintained and updated by the Petroleum Tank Management Association of Alberta (PTMAA).

Government Publication Date: Sep 2016-Apr 30, 2019

National Defense & Canadian Forces Fuel Tanks:

Federal

NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills:

Federal

NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites:

Federal

NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents:

Federal

NEBI

Locations of pipeline incidents from 2008 to present, made available by the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Dec 31, 2018

National Energy Board Wells:

Federal

NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES):

Federal

[NEES](#)

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory:

Federal

[NPCB](#)

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory:

Federal

[NPRI](#)

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Operating and Abandoned Mines:

Provincial

[OAM](#)

This data is based on the 2001 edition (revised in 2003), published by the Alberta Energy and Utilities Board (EUB) now the Alberta Energy Regulator (AER). It was a one time inventory of Operating and Abandoned Coal Mines in Alberta. In 1905, Alberta began to catalogue coal mines by assigning a unique number to each operation. This database will provide information on location, mine #, mine name, mine company, life span, amount of coal produced, depth, thickness and other important information concerning the mine.

Government Publication Date: 2001, 2003*

Oil and Gas Facilities - ST102 & ST50:

Provincial

[OGF](#)

List of batteries, gas plants, meter stations, and other facilities in the province of Alberta, made available as ST102 (Parts A and B) and ST50 (B) by the Alberta Energy Regulator (AER).

Government Publication Date: Apr 30, 2019

Oil and Gas Wells:

Private

[OGWW](#)

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-May 31, 2019

Alberta Orphan Wells:

Provincial

[ORP](#)

Orphan wells are wells that have not been properly abandoned and whose operators are defunct or insolvent. In Alberta, orphan wells fall under the responsibility of the Orphan Well Association, which works under the the delegated authority of the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB). The data includes Location, Well ID, License Name and License Number.

Government Publication Date: Jan 2007-May 31, 2019

Canadian Pulp and Paper:

Private

[PAP](#)

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks:

Federal

[PCFT](#)

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Petrochemical, Coal and Gas Operations - Certificates of Approval:

Provincial

PCG

This database contains approvals for processes pertaining to petroleum, coal, and oil and gas processing. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Pesticide Register:

Provincial

PES

This is a list of all Registered Pesticide Vendors in Alberta (retail and wholesale). The pesticide vendor list is comprised of vendors who have both audited AWSA pesticide storage facilities as part of their operation, and those vendors that do not have an audited AWSA pesticide storage facilities. Non-audited retail and wholesale vendors may be selling products that are not covered by the AWSA program, or may be utilizing external AWSA pesticide warehouses. Registration numbers and expiry dates are identified for each operation. If a registration number is not present, the operation's vendor registration is in the process of renewal.

Government Publication Date: 1998-Aug 2015

Conglomerate and Waste Management Facilities:

Provincial

PITS

This database contains approvals for processes pertaining to the use of gravel pits, sand pits, and clay pits. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Alberta Private Sewage Disposal Permits:

Provincial

PSP

These permits are private sewage disposal permits that have been issued to owners and contractors. They would include various types of installations including holding tanks, septic tanks, packaged treatment plants, sand filters, fields, mounds, lagoons and open discharges. In 2003 Alberta Municipal Affairs started collecting information and issuing permits using an electronic permitting system. These records include all private sewage disposal permits within the jurisdiction of Alberta Municipal Affairs.

Government Publication Date: 2003-2013

PTMAA Approved (Open) Permits:

Provincial

PTAP

The Petroleum Tank Management Association of Alberta maintains a list of open permits it has issued within its jurisdiction. Prior to installing, removing, or altering tanks, storage tanks owners must receive approval in the form of a permit from the Authority Having Jurisdiction (in this case, PTMAA).

Government Publication Date: Apr 2016-Mar 31, 2019

Hazardous Waste Receivers Summary:

Provincial

REC

A waste receiving location is any site or facility to which waste is transferred through a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents receivers of regulated wastes under Alberta's Waste Control Regulation, Alta. Reg. 192/96. As of 2007, Alberta Environment no longer provides detailed information on each waste receiver, such as approval number, class, and class description.

Government Publication Date: 1993-Aug 2018

Retail Fuel Storage Tanks:

Private

RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Jan 31, 2019

Scott's Manufacturing Directory:

Private

SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Special Operation Classifications - Certificates of Approval:

Provincial

SPEC

This database contains approvals for processes pertaining to classifications listed as special operations (i.e. locations owned/operated by municipalities, operations that involve the presence of pesticides). Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Inventory of Waste Disposal Sites:

Private

[WDS](#)

This one time inventory is a compilation of information collected from each region and pertains to active, regulated waste disposal sites within the province of Alberta. In the past, waste disposal sites were registered with both regional and health offices. That process was dissolved and regional landfills were developed. There is no central source of this information. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1998*

Wastewater Operations:

Provincial

[WSTE](#)

This database contains approvals for processes pertaining to wastewater treatment systems. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Alberta Water Well Information Database:

Provincial

[WWIS](#)

List of wells in the Alberta Water Well Information Database made available by Alberta Environment and Parks, containing approximately 500,000 records with nearly 5,000 drilling reports added annually. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location; some locations will be accurate to the quarter section only. The Province of Alberta advises that the data may not be fully checked, and disclaims all responsibility for its accuracy. This data was previously collected from the Groundwater Information Center of the Natural Resource Service.

Government Publication Date: 1880-Apr 30, 2019

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.



APPENDIX
City of Calgary EnviroSite Reports

D

THE CITY OF CALGARY

EnviroSite plus EnviroSite Map

Query Information

Request Number: 28381373	Charged: Yes	Response Date: 2019-09-12
CompanyID: CITIZEN	UserID: sposchmann@islengineering.com	Folio #:
Search Key: 20 FREEPORT LD NE		

Search Results for Parcel Address: 20 FREEPORT LD NE

There is no SIMS (Site Information Management System) information that matches the search criteria.

Search Results for Adjacent Address:

Search Results for Adjacent Address: 10524 15 ST NE

Environmental Reports

- Document Title: Report: "EM31 Survey at Two Sites Location Near Airport Trail, Calgary, AB"
 Author: AKS Geoscience Inc.
 Client: Golder Associates Ltd.
 Date: 2011/08/04
- Document Title: Report: "Environmental Oversight, 10524 - 15th Street NE and 1620 - 96th Avenue NE, Calgary Alberta"
 Author: Golder Associates
 Client: Oxford Properties Group
 Date: 2011/06/01
- Document Title: Report: "Hazardous Building Materials Abatement Project Completion Letter, 10524 - 15th Street NE and 1620 - 96th Avenue NE, Calgary Alberta"
 Author: Golder Associates Ltd.
 Client: Oxford Properties Group
 Date: 2010/10/13
- Document Title: Report: "Phase II Environmental Site Assessment Former Well Site 06-24-026-01 W5M, Calgary, Alberta"
 Author: Golder Associates Ltd.
 Client: Oxford Properties Group Inc.
 Date: 2009/03/12
- Document Title: Report: "Phase II Environmental Site Assessment, 10524 - 15th Street NE, 1620 - 96th Avenue NE, Calgary Alberta"
 Author: Golder Associates Ltd.
 Client: Oxford Properties Group Inc.
 Date: 2008/10/08
- Document Title: Report: "Phase I Environmental Site Assessment, 10524 - 15th Street NE, 1620 - 96th Avenue NE, Calgary Alberta"
 Author: Golder Associates Ltd.
 Client: Oxford Properties Group Inc.
 Date: 2008/03/17

Search Results for Adjacent Address: 10621 BARLOW TR NE

Environmental Reports

- Document Title: Report: "Phase II Environmental Site Assessment/Remedial Excavation, Jeff Lake, 10-24-25-1-W5M, Calgary, Alberta"
 Author: Jacques Whitford Environment Limited

Client: Nexen Inc.
Date: 2003/04/25
Document Title: Report: "Results of Supplemental Environmental Investigation Freeport Property, NE-24-25-1-W5M, Calgary, Alberta"
Author: Jacques Whitford Environment Limited
Client: Acquest Consulting Group Inc.
Date: 2003/01/27
Document Title: Report: "Freeport 10-24-25-1-W5 Gas Well Remediation Activities"
Author: Jacques Whitford Environment Limited
Client: Acquest Consulting Group Inc.
Date: 2003/01/08
Document Title: Report: "Environmental Remediation for Freeport Property, NE24-25-1-W5M, Calgary, Alberta"
Author: Jacques Whitford Environment Limited
Client: Acquest Consulting Group Inc.
Date: 2002/07/31
Document Title: Report: "Bulk Sample Results for Farm Property, Calgary, AB"
Author: Jacques Whitford Environment Limited
Client: Acquest Consulting Group Inc.
Date: 2002/07/02
Document Title: Report: "Geotechnical Report for Deep Fills, Freeport Industrial Park, Calgary, Alberta"
Author: AMEC Earth & Environmental Limited
Client: Acquest Alberta Mining Inc.
Date: 2002/02/26
Document Title: Report: "Phase II Environmental Site Assessment, Former Well Site, NE1/4-24-25-01 W5M"
Author: AMEC Earth & Environmental Limited
Client: Acquest Alberta Mining Inc.
Date: 2001/03/30
Document Title: Report: "Phase I Environmental Site Assessment of the Agricultural and Farm Property Located in the NE 1/4 24-25-01-W5M, Calgary, Alberta"
Author: AGRA Earth & Environmental Limited
Client: Acquest Alberta Mining Inc.
Date: 2000/06/23

Search Results for Adjacent Address: 12110 BARLOW TR NE

Environmental Reports

Document Title: Report: "Phase I Environmental Site Assessment, SE1/4 25-025-01 W5M and Plan 8810335, Block 1, Calgary, Alberta."
Author: Golder Associates
Client: Stonegate Holdings Ltd.
Date: 2013/01/30

Search Results for Adjacent Address: 8440 TWELVE MILE COULEE RD NW

Environmental Reports

Document Title: Report: "Level One Environmental Site Assessment of 8440 & 8660 Twelve Mile Coulee Road NW, Calgary, AB"
Author: Base Property Consultants Ltd.
Client: Southwell Trapp & Associates Ltd.
Date: 2000/10/16

Search Results for Adjacent Address: 8440 Twelve Mile Coulee Rd NW

Environmental Reports

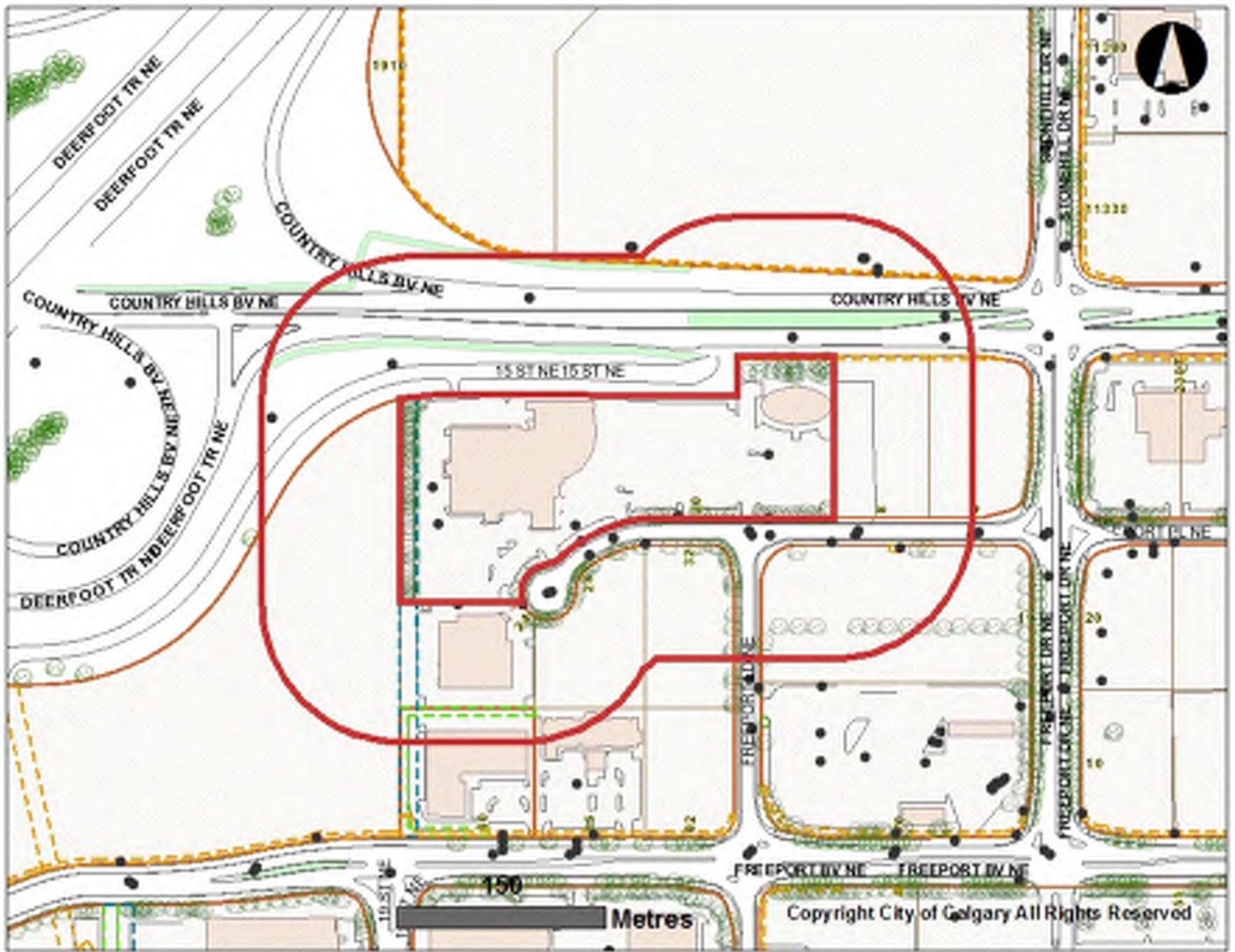
Document Title: Report: "Level One Environmental Site Assessment of 8440 & 8660 Twelve Mile Coulee Road NW, Calgary, AB"
Author: Base Property Consultants Ltd.
Client: Southwell Trapp & Associates Ltd.
Date: 2000/10/16

Map Text Info

Parcel Address: 20 FREEPORT LD NE
 Community: STONEY 2

Ward: 05
 Map #: 24N

	Selected Feature	Easements:		Fence	
	Municipal Address		- Access		Retaining Wall
	Registered Address		- By Description		Curb & Gutter
	Registered Parcel		- Miscellaneous / Other		Train Tracks
	Legal Plan Number		- No Certificate of Title		LRT Tracks
	Legal Block Number		- Overland Drainage		Fire Hydrant
	Legal Lot Number		- Utility		Manhole
	Block Lines		Street Closures		Street Light
	Lot Lines		Rivers, Lakes, Canals		Bus Stop
	Lot Dimensions		Green Space		Community Mailbox
	Roof Outlines		Tree Canopy		
	Swimming Pool		City Limits		
	100m Buffer		Landfill Boundary		Landfill Setback



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EnviroSite plus EnviroSite Map

Query Information

Request Number: 28381373 Charged: Yes Response Date: 2019-09-12
 CompanyID: CITIZEN UserID: sposchmann@islengineering.com Folio #:
 Search Key: 2451 COUNTRY HILLS BV NE

Search Results for Parcel Address: 2451 COUNTRY HILLS BV NE

There is no SIMS (Site Information Management System) information that matches the search criteria.

Search Results for Adjacent Address:

Search Results for Adjacent Address: 10621 BARLOW TR NE

Environmental Reports

- Document Title: Report: "Phase II Environmental Site Assessment/Remedial Excavation, Jeff Lake, 10-24-25-1-W5M, Calgary, Alberta"
 Author: Jacques Whitford Environment Limited
 Client: Nexen Inc.
 Date: 2003/04/25
- Document Title: Report: "Results of Supplemental Environmental Investigation Freeport Property, NE-24-25-1-W5M, Calgary, Alberta"
 Author: Jacques Whitford Environment Limited
 Client: Acquest Consulting Group Inc.
 Date: 2003/01/27
- Document Title: Report: "Freeport 10-24-25-1-W5 Gas Well Remediation Activities"
 Author: Jacques Whitford Environment Limited
 Client: Acquest Consulting Group Inc.
 Date: 2003/01/08
- Document Title: Report: "Environmental Remediation for Freeport Property, NE24-25-1-W5M, Calgary, Alberta"
 Author: Jacques Whitford Environment Limited
 Client: Acquest Consulting Group Inc.
 Date: 2002/07/31
- Document Title: Report: "Bulk Sample Results for Farm Property, Calgary, AB"
 Author: Jacques Whitford Environment Limited
 Client: Acquest Consulting Group Inc.
 Date: 2002/07/02
- Document Title: Report: "Geotechnical Report for Deep Fills, Freeport Industrial Park, Calgary, Alberta"
 Author: AMEC Earth & Environmental Limited
 Client: Acquest Alberta Mining Inc.
 Date: 2002/02/26
- Document Title: Report: "Phase II Environmental Site Assessment, Former Well Site, NE1/4-24-25-01 W5M"
 Author: AMEC Earth & Environmental Limited
 Client: Acquest Alberta Mining Inc.
 Date: 2001/03/30
- Document Title: Report: "Phase I Environmental Site Assessment of the Agricultural and Farm Property Located in the NE 1/4 24-25-01-W5M, Calgary, Alberta"
 Author: AGRA Earth & Environmental Limited
 Client: Acquest Alberta Mining Inc.

Date: 2000/06/23

Search Results for Adjacent Address: 8440 TWELVE MILE COULEE RD NW

Environmental Reports

Document Title: Report: "Level One Environmental Site Assessment of 8440 & 8660 Twelve Mile Coulee Road NW, Calgary, AB"
Author: Base Property Consultants Ltd.
Client: Southwell Trapp & Associates Ltd.
Date: 2000/10/16

Search Results for Adjacent Address: 8440 Twelve Mile Coulee Rd NW

Environmental Reports

Document Title: Report: "Level One Environmental Site Assessment of 8440 & 8660 Twelve Mile Coulee Road NW, Calgary, AB"
Author: Base Property Consultants Ltd.
Client: Southwell Trapp & Associates Ltd.
Date: 2000/10/16

Search Results for Adjacent Address: 8925 BARLOW TR NE

Environmental Reports

Document Title: Report: Phase I Environmental Site Assessment McCall Way NE & McCall Landing NE Calgary, AB"
Author: Curtis Engineering Associates Ltd.
Client: Norcal Construction
Date: 2012/09/30

Document Title: Report: "Phase II Environmental Site Assessment, Hopewell - Barlow Trail Commercial Development, Barlow Trail & Freeport Boulevard NE, Calgary AB."
Author: JASA Engineering Inc
Client: Hopewell Development Corporation
Date: 2006/01/31

Document Title: Report: "The Calgary Airport Authority 2001 Site Management Plan - Environmental Section"
Author: Calgary International Airport
Client:
Date: 2001/01/01

Document Title: Report: "Phase I Environmental Site Assessment on Seven Parcels of Land, Calgary International Airport"
Author: Dillon Consulting Limited
Client: Calgary Airport Authority
Date: 1998/12/02

Document Title: Report: "Calgary Airport Authority Environmental Management Program 1997"
Author: Calgary Airport Authority
Client:
Date: 1997/12/31

Document Title: Report: "1996 Annual Noise Report"
Author: Calgary Airport Authority
Client:
Date: 1996/12/31

Document Title: Report: "Calgary International Airport Master Plan"
Author: Calgary Airport Authority
Client:
Date: 1996/01/01

Document Title: Report: "Calgary Airport Authority Environmental Management Program 1995"
Author: Calgary Airport Authority
Client:
Date: 1995/12/31

Document Title: Report: "Calgary Airport Authority Environmental Management Program 1994"
Author: Calgary Airport Authority
Client:
Date: 1994/04/30

Document Title: Report: "Calgary Airport Authority Environmental Management Program 1993"
Author: Calgary Airport Authority
Client:
Date: 1993/12/31

Document Title: Report: "Calgary International Airport Environmental Audit 1990"
Author: Kilborn Engineering Alberta Ltd
Client: Transport Canada - Airports Group
Date: 1991/05/31

Document Title: Report: "Calgary International Airport Environmental Plan"
Author: Transport Canada Airports Group
Client: Calgary International Airport
Date: 1990/08/31

Petroleum Storage Tanks

Historical number of tanks from the Petroleum Tank Management Association(1996): 4, 1, 6, 3, 3, 3

Commercial/Industrial Users:

Company Name: CALGARY INTERNATIONAL AIRPORT
Description: Airport Facilities
Operating From: 2016
Operating To: 1988

Search Results for Adjacent Address: NORTH EAST CALGARY

Environmental Reports

Document Title: Report: "Northpoint Residential Plan, Phase II Environmental Site Assessment"
Author: Stantec Consulting Ltd.
Client: Walton Development and Management
Date: 2007/06/30

Document Title: Report: "Sour Gas Development Setback Review in Support of the Northeast Regional Policy Plan and Area Structure Plans"
Author: Stantec Consulting
Client: Walton International Group Inc.
Date: 2006/07/31

Search Results for Adjacent Address: NW1/4 21-25-29 W4M

Environmental Reports

Document Title: Report: "Phase II Environmental Site Assessment, Hopewell Airport Park Phase II, 25th Street NE & Freeport Boulevard, Calgary, Alberta"
Author: JASA Engineering Inc.
Client: Hopewell Development Master LP
Date: 2010/05/31

Search Results for Adjacent Address: W1/2 21-25-29 W4M

Environmental Reports

Document Title: Report: "Geotechnical Evaluation, Barlow North - Phase 1, Calgary, Alberta"
Author: McIntosh Lalani Engineering Ltd.
Client: Calgary Airport Authority
Date: 2003/05/29

Document Title: Report: "Environmental Soil Sample - Parcel A Plan 9210847, Calgary, AB"
Author: Base Property Consultants Ltd.
Client: Urban Systems Limited
Date: 2003/05/23

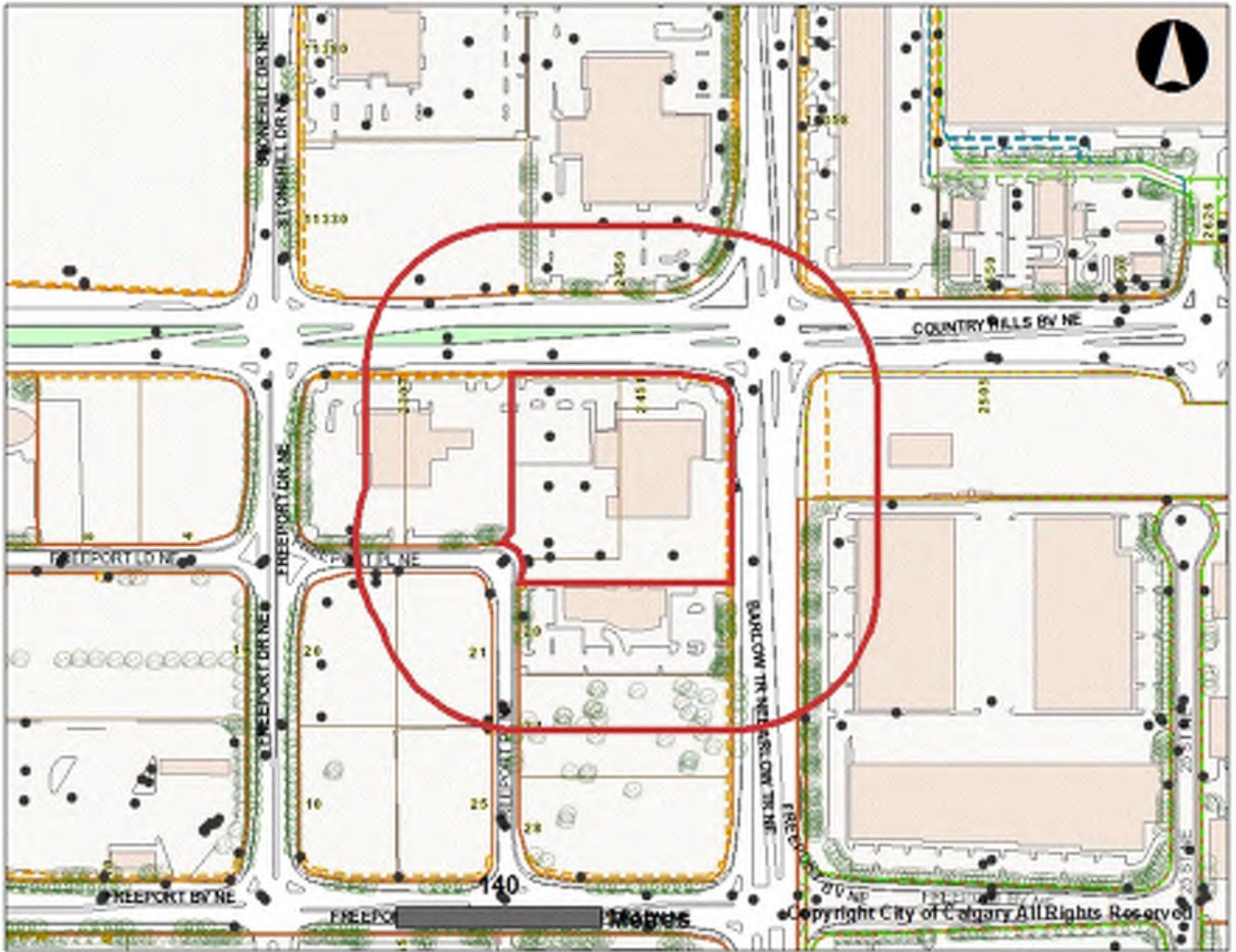
Document Title: Report: "Extract from 1999 Phase 1 Environmental Site Assessment, Re: Parcel 6 (Barlow North)"
Author: Dillon Consulting Limited
Client: Calgary Airport Authority
Date: 1999/01/01

Map Text Info

Parcel Address: 2451 COUNTRY HILLS BV NE
 Community: STONEY 2

Ward: 05
 Map #: 24N

	Selected Feature	Easements:		Fence	
	Municipal Address		- Access		Retaining Wall
	Registered Address		- By Description		Curb & Gutter
	Registered Parcel		- Miscellaneous / Other		Train Tracks
	Legal Plan Number		- No Certificate of Title		LRT Tracks
	Legal Block Number		- Overland Drainage		Fire Hydrant
	Legal Lot Number		- Utility		Manhole
	Block Lines		Street Closures		Street Light
	Lot Lines		Rivers, Lakes, Canals		Bus Stop
	Lot Dimensions		Green Space		Community Mailbox
	Roof Outlines		Tree Canopy		
	Swimming Pool		City Limits		
	100m Buffer		Landfill Boundary		Landfill Setback



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THE CITY OF CALGARY

EnviroSite plus EnviroSite Map

Query Information

Request Number: 28381373	Charged: Yes	Response Date: 2019-09-12
CompanyID: CITIZEN	UserID: sposchmann@islengineering.com	Folio #:
Search Key: 11175 14 ST NE		

Search Results for Parcel Address: 11175 14 ST NE

There is no SIMS (Site Information Management System) information that matches the search criteria.

Search Results for Adjacent Address:

Search Results for Adjacent Address: 10821 15 ST NE

Environmental Reports

Document Title:	Report: "Risk Management Plan Stoney Lands Development Municipal Reserve (MR)
Author:	AMEC
Client:	Melcor Developments
Date:	2014/12/31
Document Title:	Report: "Phase II Environmental Site Assessment 10821 and 11142 - 15 Street NE Calgary, AB"
Author:	AMEC Environment & Infrastructure
Client:	Melcor Developments Ltd.
Date:	2013/04/30
Document Title:	Report: "Phase II Environmental Site Assessment, 10821 and 11142 - 15 Street NE, Calgary, AB"
Author:	AMEC Environment & Infrastructure
Client:	Fraser Milner Casgrain LLP
Date:	2013/04/03
Document Title:	Report: "Assessment of Potential Petroleum Hydrocarbons in Soil, 10821 15 Street NE and 11142 15 Street NE, Calgary, AB"
Author:	AMEC
Client:	Urban Systems Ltd.
Date:	2012/07/12

Search Results for Adjacent Address: 11142 15 St NE

Environmental Reports

Document Title:	Report: "Phase I Environmental Site Assessment Country Hills Crossing Outline Plan Portion of NE 1/4-23-025-01-W5M and NW1/4-24-025-01-W5M Calgary, AB"
Author:	Jacques Whitford AXYS
Client:	Melcor Developments Ltd
Date:	2008/09/04

Search Results for Adjacent Address: 11155 14 ST NE

Environmental Reports

Document Title:	Report: "Phase II Environmental Site Assessment 11155 14 Street NE Calgary, Alberta"
-----------------	--

Author: Envirotech
Client: McDonald's Restaurants of Canada
Date: 2013/09/30
Document Title: Report: "Phase I Environmental Site Assessment 11155 14 Street NE Calgary, Alberta"
Author: Envirotech
Client: IBI Group
Date: 2013/08/31

Search Results for Adjacent Address: 1350 COUNTRY HILLS BV NE

Environmental Reports

Document Title: Report: "Phase Two Environmental Site Assessment of 1350 Country Hills BV NE Calgary, Alberta"
Author: Base Property
Client: Stock Feed & Seed Corporation
Date: 2010/06/02
Document Title: Report: "Phase One Environmental Site Assessment of 1350 Country Hills BV NE Calgary, Alberta"
Author: Base Property
Client: Stock Feed & Seed Corporation
Date: 2010/05/30

Search Results for Adjacent Address: 1510 COUNTRY HILLS BV NE

Environmental Reports

Document Title: Report: "Phase I Environmental Site Assessment, Vacant Property, 1510 Country Hills Boulevard NE, Calgary, Alberta"
Author: Environmental Diagnostics Inc.
Client: Hyatt Auto Sales Ltd.
Date: 2007/09/30

Search Results for Adjacent Address: 26-25-01 W5M

Environmental Reports

Document Title: Report: "Phase I Environmental Site Assessment - Stoney Industrial Park, Approx. 195 Hectare Parcel of Land NW of Deerfoot Tr at Country Hills Bv, Calgary, AB"
Author: Jacques Whitford Environment Limited
Client: Walker Newby & Partners Inc.
Date: 2001/04/11

Search Results for Adjacent Address: Country Hills BV and 15 ST NE

Environmental Reports

Document Title: Report: "Geotechnical Report for Slope Stability Stoney Industrial Subdivision Country Hills Boulevard and 15th Street NE Calgary, Alberta"
Author: Jacques Whitford and Associates Limited
Client: Walker Newby & Partners Inc
Date: 2001/04/23
Document Title: Report: "Geotechnical Evaluation Report Stoney Industrial Subdivision Country Hills Boulevard and 15th Street NE Calgary, Alberta"
Author: Jacques Whitford and Associates Limited
Client: Walker Newby & Partners Inc
Date: 2001/04/20

Search Results for Adjacent Address: Portion NE 1/4 23-25-01-W5M Portion NW 1/4 24-25-01-W5M

Environmental Reports

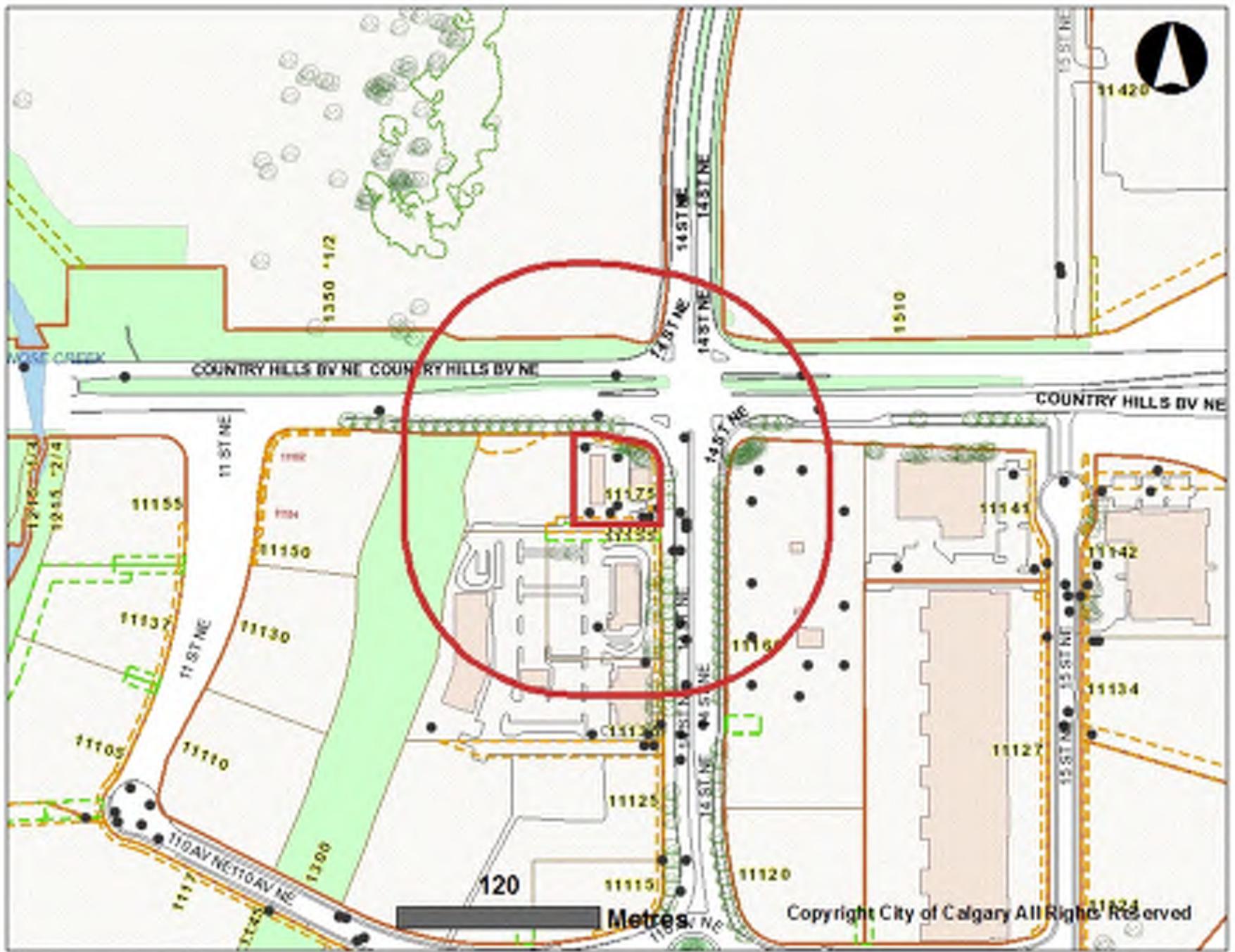
Document Title: Report: "Phase I Environmental Site Assessment Portion of NE 1/4 23-25-01-W5M and NW 1/4 24-025-01-W5M Calgary, Alberta"
Author: AMEC Environment & Infrastructure
Client: Urban Systems Ltd.
Date: 2012/10/03

Map Text Info

Parcel Address: 11175 14 ST NE
 Community: STONEY 1

Ward: 03
 Map #: 23N

	Selected Feature	Easements:		Fence	
	Municipal Address		- Access		Retaining Wall
	Registered Address		- By Description		Curb & Gutter
	Registered Parcel		- Miscellaneous / Other		Train Tracks
	Legal Plan Number		- No Certificate of Title		LRT Tracks
	Legal Block Number		- Overland Drainage		Fire Hydrant
	Legal Lot Number		- Utility		Manhole
	Block Lines		Street Closures		Street Light
	Lot Lines		Rivers, Lakes, Canals		Bus Stop
	Lot Dimensions		Green Space		Community Mailbox
	Roof Outlines		Tree Canopy		
	Swimming Pool		City Limits		
	100m Buffer		Landfill Boundary		Landfill Setback



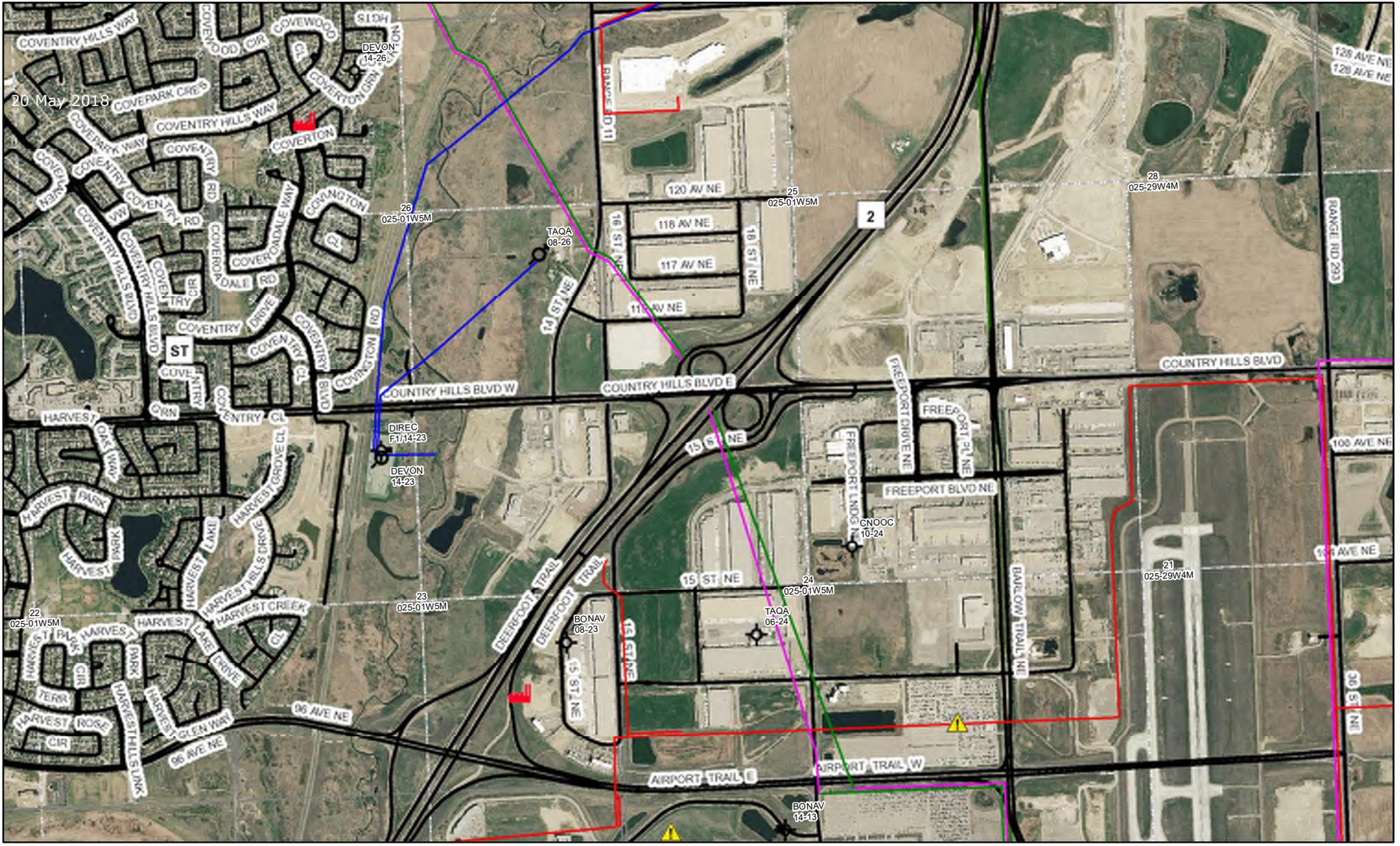
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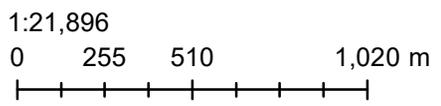
APPENDIX
Regulatory Searches

E



20 May 2018

Friday, September 13, 2019





Well Information

100 / 14-23-025-01 W5 / 0

DEVON CANADA CORPORATION | 100 / 14-23-025-01 W5 / 0

Government Well Data Current To September 4, 2019

License #:	0022789	License Date:	August 1, 1962
Well Name:	PIONEER CANADA CROSSFIELD 14-23-25-1		
License Status:	RecCertified	License Status Date:	May 29, 1979
Within:	14-23-025-01 W5M	H2S (%):	
Spud Date:	August 8, 1962	Final Drill Date:	August 18, 1962
Status:	WATER ABD INJ	Abandoned Date:	April 4, 1973
Surface:		Downhole:	
Offsets:	S 201.2 E 652.6	Offsets:	S 201.2 E 652.6
Latitude:	51.152373	Latitude:	51.152373
Longitude:	-114.038585	Longitude:	-114.038585
Ground Elevation:	1059.5 m 3476 '	Total Depth:	1777.60 m 5832 '
Operator:	n/a		



Well Information

1F1 / 14-23-025-01 W5 / 0

DIRECT ENERGY MARKETING LIMITED | 1F1 / 14-23-025-01 W5 / 0

Government Well Data Current To September 4, 2019

License #:	0038439	License Date:	July 17, 1970
Well Name:	DEML CROSS 14-23-25-1		
License Status:	RecCertified	License Status Date:	November 28, 2012
Within:	14-23-025-01 W5M	H2S (%):	
Spud Date:	July 28, 1970	Final Drill Date:	July 28, 1970
Status:	ABD	Abandoned Date:	November 5, 1970
Surface:		Downhole:	
Offsets:	S 170.7 E 652.6	Offsets:	S 170.7 E 652.6
Latitude:	51.152647	Latitude:	51.152647
Longitude:	-114.038584	Longitude:	-114.038584
Ground Elevation:	1059.6 m 3476 '	Total Depth:	228.60 m 750 '
Operator:	n/a		



Pipeline Information

BONAVISTA ENERGY CORPORATION | 6128 - 4

AER Pipeline Data Current to September 6, 2019

Permit Date:	October 14, 2015	License Date:	March 16, 1995
From Location:	14-23-25-1 W5M BE	To Location:	3-26-25-1 W5M BE
Length:	0.22 kms 0.14 mi	Status:	A
Substance:	FW	H₂S:	0 mol/kmol 0 ppm
Outside Diameter:	60.3 mm 2.37 "	Wall Thickness:	3.91 mm 0.15 "
Material:	S	Type:	5L
Grade:	B	Max Operating Pressure:	0 kPa 0 psi
Joints:	W	Internal Coating:	U
Stress Level:	0 %	Environment:	
Original Permit Date:		Construction Date:	
Original License/Line No:	6128 - 4	NEB Registration:	
Abacus No:	N/A		



Pipeline Information

PLAINS MIDSTREAM CANADA ULC | 3639 - 20

AER Pipeline Data Current to September 6, 2019

Permit Date:	November 27, 2015	License Date:	
From Location:	4-25-25-1 W5M BE	To Location:	4-25-25-1 W5M BE
Length:	0.19 kms 0.12 mi	Status:	R
Substance:	LV	H₂S:	0 mol/kmol 0 ppm
Outside Diameter:	168.3 mm 6.63 "	Wall Thickness:	4.78 mm 0.19 "
Material:	S	Type:	5L
Grade:	X42	Max Operating Pressure:	0 kPa 0 psi
Joints:	W	Internal Coating:	U
Stress Level:	0 %	Environment:	
Original Permit Date:	October 15, 1996	Construction Date:	
Original License/Line No:	3639 - 9	NEB Registration:	
Abacus No:	N/A		



Pipeline Information

PLAINS MIDSTREAM CANADA ULC | 1385 - 1 AER Pipeline Data Current to September 6, 2019

Permit Date:	November 27, 2015	License Date:	
From Location:	11-35-25-1 W5M BE	To Location:	4-25-25-1 W5M BE
Length:	2.53 kms 1.58 mi	Status:	A
Substance:	CO	H₂S:	0 mol/kmol 0 ppm
Outside Diameter:	219.1 mm 8.63 "	Wall Thickness:	4.8 mm 0.19 "
Material:	S	Type:	5L
Grade:	A	Max Operating Pressure:	0 kPa 0 psi
Joints:	W	Internal Coating:	U
Stress Level:	0 %	Environment:	CC
Original Permit Date:	October 15, 1996	Construction Date:	
Original License/Line No:	1385 - 1	NEB Registration:	
Abacus No:	N/A		



Pipeline Information

ATCO GAS AND PIPELINES LTD. | 5895 - 57

AER Pipeline Data Current to September 6, 2019

Permit Date:	March 22, 1994	License Date:	April 15, 2003
From Location:	4-24-25-1 W5M PL	To Location:	9-23-25-1 W5M RS
Length:	0.5 kms 0.31 mi	Status:	O
Substance:	NG	H₂S:	0.01 mol/kmol 10 ppm
Outside Diameter:	219.1 mm 8.63 "	Wall Thickness:	4.8 mm 0.19 "
Material:	S	Type:	Z245.1
Grade:	2901	Max Operating Pressure:	4960 kPa 719 psi
Joints:	W	Internal Coating:	U
Stress Level:	39 %	Environment:	
Original Permit Date:	March 22, 1994	Construction Date:	
Original License/Line No:	5895 - 57	NEB Registration:	
Abacus No:	140395		



Facility Information

FACILITIES AT 08-23-025-01 W5

Government Facility Data Current To September 6, 2019

BATTERY | ABBT2670014

Type: CRUDE OIL SINGLE-WELL BATTERY
Status: SUSPENDED **License #:** W 0022219
Name: NORTHSTAR CROSSFIELD 08-23
Operator: BONAVISTA ENERGY CORPORATION
Licensee: BONAVISTA ENERGY CORPORATION



APPENDIX
Site Visit Photographs

F

Site photographs were taken during the site visit conducted on August 15, 2019.



Photo 1 Drive-by photograph of the recent Country Hills Boulevard (CHB) and Coventry Boulevard NE intersection upgrades; southeastern view, along the west end of CHB



Photo 2 Drive-by photograph of the recent Country Hills Boulevard (CHB) and Coventry Boulevard NE intersection upgrades; southern view, along the west end of CHB



Photo 3 Drive-by photograph of the Canadian Pacific (CP) Rail track adjacent the Coventry Hills community residences and the Nose Creek; northern view, along the west end of CHB



Photo 4 Drive-by photograph of Stone Creek Adventure Golf adjacent to the Harvest Hills neighbourhood and Nose Creek; southern view, along the west end of CHB



Photo 5 Stormwater wet pond adjacent the CP Rail, Nose Creek, and the north side of CHB; northern view.



Photo 6 Minor overhead transmission lines (running east-west), underground natural gas pipeline (running east-west) warning sign; eastern view, taken from the north side of CHB from the west end of CHB



Photo 7 Minor overhead transmission lines (running east-west), underground natural gas pipeline (running east-west) warning sign; western view, taken from the north side of CHB from the west end of CHB



Photo 8 Major overhead transmission lines (running north-south); southern view, taken from the north side of CHB around Nose Creek



Photo 9 Major overhead transmission lines (running north-south); northern view, taken from the north side of CHB from the west end of CHB



Photo 10 Nose Creek Bridge portion of the west end of CHB; eastern view.



Photo 11 “N 41” stormwater outfall along the Nose Creek, within the west end of the Study Area.



Photo 12 “N 41” stormwater outfall along the Nose Creek; within the west end of the Study Area.



Photo 13 Drainage of “N 42” stormwater outfall into the Nose Creek; within the west end of the Study Area.



Photo 14 Overview of “N 41” and “N 42” stormwater outfalls into the Nose Creek; western view, adjacent the west end of CHB.



Photo 15 Stormwater holding pond for stormwater outfall “N 42”, within the west end of the Study Area.



Photo 16 Stormwater drainage pathway for the northern side of CHB, leads to stormwater outfall “N 42”.



Photo 17 Underside of the Nose Creek Bridge portion of the west end of CHB.



Photo 18 Underside of the Nose Creek Bridge portion of the west end of CHB, northern view.



Photo 19 A southern view of Nose Creek from the southern side of CHB.



Photo 20 Nose Creek recreational pathway along the southern side of CHB, eastern view.



Photo 21 An example of the waste containers along the Nose Creek pathway.



Photo 22 Active road construction area on CHB, western view.



Photo 23 An example of the curbside paved drainage grates and catch basins along CHB.



Photo 24 Pavement staining at the 14 Street NE and CHB intersection.

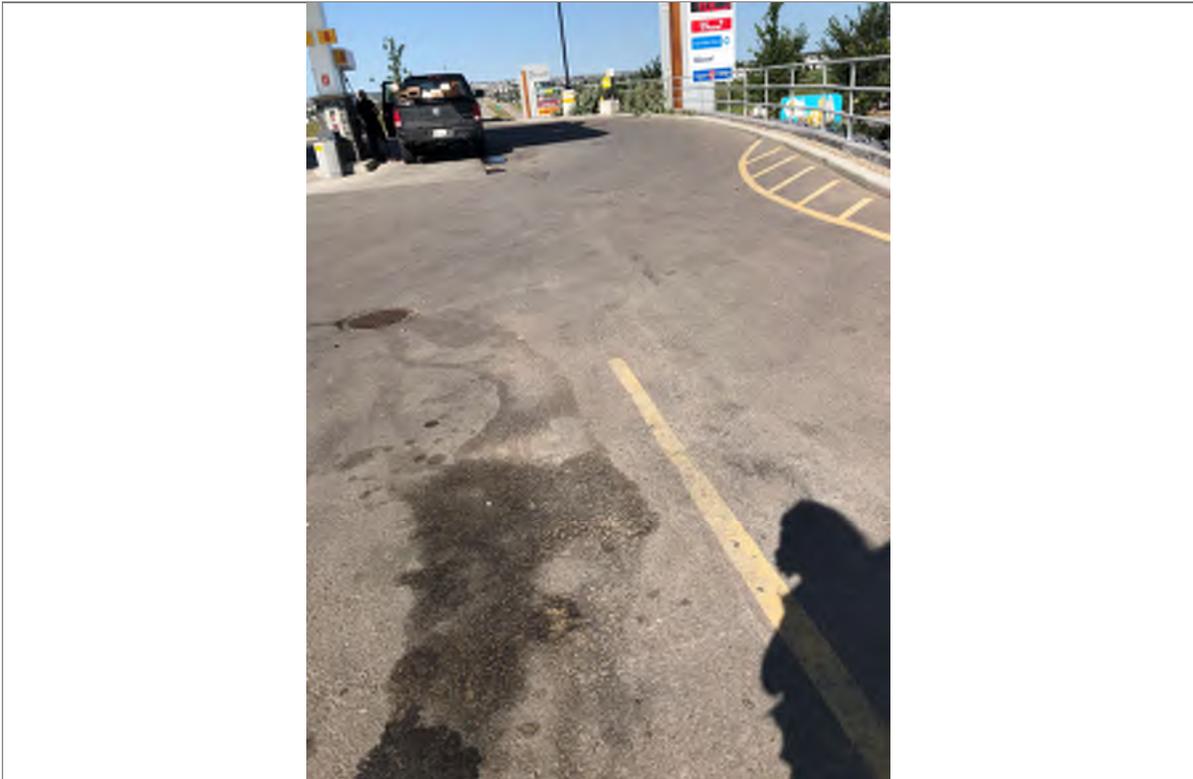


Photo 25 Pavement staining leading to a drainage grate on the Shell gas station property on the southern side of CHB; adjacent the 14 Street NE and CHB intersection.



Photo 26 Pavement staining on the Shell gas station property parking area on the southern side of CHB; adjacent the 14 Street NE and CHB intersection.



Photo 27 Shell gas station and their business waste containers, area appears to be for storage; note a leaking water valve flowing out from the curb and onto their supplies.

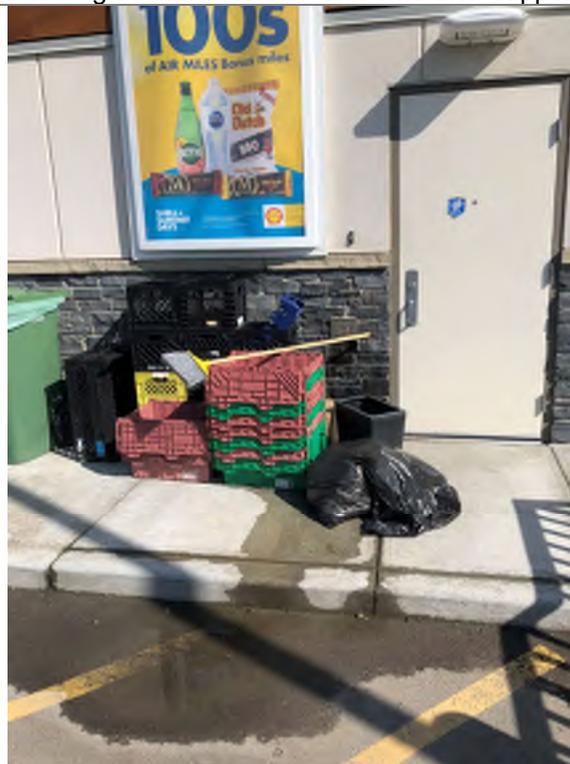


Photo 28 Shell gas station leaking water valve flowing out from the curve and onto their supplies and garbage.



Photo 29 Shell gas station up-close leaking water valve flowing out from the curve and onto their supplies.



Photo 30 Drive-by photograph of the southeastern view of Deerfoot Trail from CHB



Photo 31 Northern view of Deerfoot Trail from the CHB overpass.



Photo 32 Northeastern view of Deerfoot Trail and CHB from the CHB overpass



Photo 33 Agricultural land adjacent the eastern side of Deerfoot Trail, the southern side of CHB and the western end of the Country Hills Toyota property.



Photo 34 Drive-by photograph of the southern view of the Country Hills Toyota dealership property on the, on the southern side of CHB.



Photo 35 Pavement staining leading to a paved drainage area on the Country Hills Toyota dealership property.



Photo 36 Miscellaneous holding containers on the western side of the Country Hills Toyota dealership property.



Photo 37 Pavement staining, as well as metal and cardboard holding containers on the western side of the Country Hills Toyota dealership property.



Photo 38 Miscellaneous containers and items stored outside on the western side of the Country Hills Toyota dealership property.



Photo 39 Row of sea can general storage containers on the western side of the Country Hills Toyota dealership property.



Photo 40 Country Hills Hyundai dealership on the southern side of CHB; western view, taken from the east end of the Site.



Photo 41 Country Hills Hyundai dealership sea can general storage containers on the western side of the property.



Photo 42 Country Hills Hyundai dealership EV charging stations and used oil contained on the western side of the property.



Photo 43 A southern view of the Country Hills Nissan dealership property on the southern side of CHB; taken from the east end of CHB.



Photo 44 Storage tank located on the western side of the Country Hills Nissan dealership property, as well as adjacent minor pavement staining.



Photo 45 Up-close view of the storage tank located on the western side of the Country Hills Nissan dealership property.



Photo 46 Oily liquid substance on roadway surface adjacent the developing Stonegate Landing at the Freeport Drive NE and CHB intersection.



Photo 47 Standing water north of CHB, and west of Freeport Drive NE.



Photo 48 Standing water north of CHB, east of Freeport Drive NE, and adjacent the Country Hills Volkswagen dealership.



Photo 49 Country Hills Volkswagen dealership on the northern side of CHB; taken from the east end of CHB.



Photo 50 Mercedes-Benz dealership on the northern side of CHB; taken from the east end of CHB.



Photo 51 Rotary/Mattamy Greenway multi-use recreational pathway; taken from the CHB and Barlow Trail intersection.



Photo 52 ATCO gas facility fenced with signage on the eastern side of Deerfoot Trail



Photo 53 ATCO gas facility.



Photo 54 ATCO gas facility.



Photo 55 Drive-by photograph of the ATCO gas facility on the eastern side of Deerfoot Trail.



Photo 56 Drive-by photograph approaching CHB overpass from Deerfoot Trail; northern view.



Photo 57 Drive-by photograph approaching CHB overpass from Deerfoot Trail; southern view.



Photo 58 Drive-by photograph of the southbound lanes of Deerfoot Trail and merging area for CHB; southwestern view.



APPENDIX
Resumes

G



Soren Poschmann, P.Geo.

Lead, Hydrogeology

Career Highlights

As the Lead, Hydrogeology, Soren brings over 12 years of comprehensive experience in environmental consulting for municipal water source operators, private landowners and industrial operations such as oil and gas, pipelines and aggregate.

Soren has provided groundwater source well condition assessments, design installation, testing and licensing; potential source aquifer investigations; well network planning; and regulatory advice for multiple municipalities as well as other industrial clients in Alberta, British Columbia and Saskatchewan. Additionally, Soren has managed numerous small and large scale industrial Environmental Impact Assessments, Water Act applications, groundwater supply and contaminant hydrogeology projects. Soren strives to create an environment of collaboration between Project Teams and Clients and builds strong working relationships that drives long term successes.

Relevant Experience

- North Reservoir Design & Construction - Water Source Well Testing and Licensing (Town of Sylvan Lake) – 2018 to date
- Annual Groundwater Monitoring Reporting, Groundwater Sourcing Strategy Support and Groundwater Licensing (Coalspur Mines (Operations) Vista Coal Mine) – 2018 to date
- Grasslands National Park - Frenchman Valley Water Source Well Installation and Testing (Parks Canada Agency) – 2018 to date
- Highway 1A:06 Interim Interchange - Environmental Lead (Alberta Transportation) – 2018 to date
- Groundwater Monitoring Program Development, Sampling and Reporting (Private Developer, Calgary, AB) – 2017 to date
- Development Application Hydrogeological Reviews (Multiple Counties in Alberta) – 2017 to date
- Highway 3 Sentinel to Pincher Station: Functional Planning Study, Upgrading and Twinning - Environmental Lead (Alberta Transportation) – 2017 to date
- Phase I Environmental Site Assessments (Multiple Clients) – 2017 to date
- Regulatory Advisory Services (Multiple Municipalities in Alberta, Saskatchewan and BC) – 2017 to date
- Rising Groundwater Study (Village of Hythe) – 2018 to 2019
- Wastewater Treatment Plant Sampling Audit (Town of Nanton) – 2018
- Dewatering Assessments (Town of Hinton) – 2017 to 2018
- Calgary Zoo Flood Mitigation – Dewatering and Observation Well Installation, Testing and Monitoring (City of Calgary) – 2016 to 2018
- SPCA Dewatering System Design and Installation (City of Saskatoon) – 2017
- Guernsey Groundwater Source Well Design, Installation, Testing and Permitting (Rural Municipality of Usborne No. 310) – 2017
- Alternate Water Source Assessment (Village of Pemberton) – 2017
- Illecillewaet Groundwater Source Assessment (BC Ministry of Transportation) – 2017
- Waneta Dam - Water Supply and Treatment Study (Fortis BC) – 2016 to 2017
- Slumping Berm Investigation – Hydrogeology Assessment and Monitoring Well Installation (AltaLink) – 2016
- Crowchild Trail Study – Dewatering Assessment (City of Calgary) – 2016

EDUCATION

University of Calgary, 2007

Bachelor of Science (Honours) – Applied and Environmental Geology

EMPLOYMENT HISTORY

ISL Engineering and Land Services

2016 to date

Lead, Hydrogeology

Matrix Solutions

2008 to 2016

Hydrogeologist

Aqua Terre Solutions

2007 to 2008

Environmental Scientist

AFFILIATIONS AND ACTIVITIES

Association of Professional Engineers and Geoscientists of Alberta - Professional Geologist

Engineers and Geoscientists BC - Professional Geologist

Association of Professional Engineers and Geoscientists of Saskatchewan - Professional Geoscientist

International Association of Hydrogeologists - Member

National Ground Water Association - Member

PUBLICATIONS/PRESENTATIONS

Poschmann S. Calgary Zoo Flood Mitigation: Groundwater Management and Dewatering on an Island. Environmental Services Association of Alberta EnviroTech Conference and Canadian Water Resources Association National Conference. Calgary, Alberta and Collingwood, Ontario (presentation)., 2019

Poschmann S. and S. Sullivan. Developing a Local-Scale, Integrated Surface Water and Groundwater Management Plan for Water Sourcing for Unconventional Projects. Canadian Society of Petroleum Geologists GeoConvention. Calgary, Alberta. May 2015 (presentation)., 2015

Poschmann S. and A. Haluszka. Deep Groundwater Exploration and Characterization in Alberta, Canada. National Groundwater Association Conference on Characterization of Deep Groundwater. Denver, Colorado. May 2014 (presentation)., 2014

Poschmann S. and A. Haluszka. Groundwater Supply Considerations for Hydraulic Fracturing. Canadian Society of Petroleum Geologists Gussow Conference. Banff, Alberta. November 2012 (presentation)., 2012

Poschmann S. Establishing a recharge area for Big Hill Springs, Alberta. University of Calgary B.Sc. undergraduate thesis. Calgary, Alberta (presentation)., 2007





Laura York, B.Sc.

Junior Environmental Specialist

Career Highlights

Laura is a Junior Environmental Specialist in ISL's Calgary office responsible for performing a variety of environmental and hydrogeological field assessments, preparing high quality field documentation and conducting detailed data analysis. This includes water source and monitoring, well drilling and installation, hydraulic conductivity and pumping tests, and groundwater monitoring and sampling. Laura also supervises contractors on-site, conducts construction site monitoring to ensure compliance with the scope of work, and environmental legislation and permits. She is also responsible for conducting biophysical fieldwork, e.g. habitat assessments, fish salvages, vegetation assessments, wetland valuations, construction monitoring. Laura holds a Bachelor of Science degree in environmental sciences from the University of Lethbridge.

Relevant Experience

Since joining ISL, Laura has worked on the following projects:

- Leduc Growth Study (City of Leduc) – 2018 to date
- North Reservoir Design & Construction (Town of Sylvan Lake) – 2018 to date
- Hythe Rising Groundwater Study (Village of Hythe) – 2018 to date
- ALTALINK Wetland Monitoring (AltaLink) – 2018 to date
- City of Calgary - Bike Skills Park Environmental Services (City of Calgary) – 2019
- Central Butte Water Well (Town of Central Butte) – 2019
- Red Deer Engineering Services for Stormwater Outfall Repairs - 2019 (City of Red Deer) – 2019
- Hwy 21 Functional Plan & Left-in (City of Fort Saskatchewan) – 2019
- Groundwater Exploration Program Support for the Vista Coal Mine (Coalspur Mines Operations Ltd.) – 2019
- Groundwater Diversion Licensing Reports for Vista Coal Mine (Coalspur Mines Operations Ltd.) – 2019
- Town of High River SW Infrastructure Phase 5 - Highwood Trail (Town of High River) – 2019
- 2018 Annual Groundwater Monitoring Reporting (Coalspur Mines Operations Ltd.) – 2019
- 2019 Central Region Chip Seal Coat and Micro Surfacing Program (Alberta Transportation) – 2019
- Hwy. 2:02 & 2:06 ACP Overlay (Alberta Transportation) – 2019
- 2019 Southern Region Chip Seal Coat (Alberta Transportation) – 2019
- 144 Ave NW Symons Valley Bridge FPS (City of Calgary) – 2019
- Util. Crossing Bank Stabilization (City of Calgary) – 2019

Prior to joining ISL, Laura spent a year contracted to various fishing vessels for the Department of Fisheries and Oceans monitoring a variety of fishing processes.

EDUCATION

University of Lethbridge, 2017

Bachelor of Science, Environmental Science

Lethbridge College, 2016

Environmental Assessment and Reclamation

Additional Training

Occupational First Aid - Level 3

Esri ArcMap

Esri Python

Standard First Aid, Level C CPR with AED

Mock Mediation for Environmental Conflict Resolution

EMPLOYMENT HISTORY

ISL Engineering and Land Services

2018 to date

Junior Environmental Specialist

Archipelago Marine Research

2017 to 2018

At-Sea Observer

Dekalb-Monsanto

2017 (March to June)

Seed Breeding Assistant

Bob Richards Construction

2014 to 2015

Labourer



Jasmine Skirten

Hydrogeology Co-op Student

EDUCATION

University of Calgary, 2021

Bachelor of Science, Geology Major
Bachelor of Science, Environmental Science
Major with Geology Concentration

Mount Royal University, 2016

Environmental Sciences

EMPLOYMENT HISTORY

ISL Engineering and Land Services

Hydrogeology Co-op Student

Career Highlights

Jasmine is a Hydrogeology Co-op Student placed with ISL for a 4-month term. She is currently enrolled at the University of Calgary earning a Bachelor of Science degree with majors in Geology and Environmental Science. She is expected to graduate in December 2021.

Jasmine is working in our Municipal Engineering Group under the supervision of a Professional Hydrogeologist. To date she has been involved in writing technical reports including soil and groundwater monitoring and Phase I environmental site assessments; completing data analysis of hydraulic conductivity tests and soil and groundwater chemistry data; providing field supervision of borehole drilling, groundwater monitoring well installation, hydraulic conductivity tests and groundwater monitoring and sampling; conducting field visits for Phase I environmental site assessments; and reviewing reports as a third-party reviewer.

Relevant Experience

Since joining ISL, Jasmine has been involved with the following projects:

- Sarcee Trail & Richmond Road SW At-Grade Intersection Improvements (City of Calgary) – 2019
- High River 12 Avenue Renewal (Town of High River) – 2019
- Calgary Parking Authority Impound Lot (Calgary Parking Authority) – 2019
- 5 Street SE CPR Underpass (Calgary Municipal Land Corporation) – 2019
- Greenwood Flood Protection (City of Greenwood) – 2019
- Crowsnest Pass Owner's Engineer Services (Municipality of Crowsnest Pass) – 2019
- Moose Jaw Cast Iron Watermain Replacement Program, Phase IV (City of Moose Jaw) – 2019
- Central Butte Water Well (Town of Central Butte) - 2019





RELATED REPORT
Preliminary Natural Site Assessment

2



Approval

DATE: November 12, 2019

To: Brent Piche
ISL Engineering
BPiche@islengineering.com

From: Carol Stefan
City of Calgary
Parks Ecologist

RE: PRELIMINARY NATURAL SITE ASSESSMENT – COUNTRY HILLS BOULEVARD
FUNCTIONAL PLANNING STUDY

Thank you for submitting the above-noted Preliminary Natural Site Assessment (PNSA). Parks has reviewed the subject document and approves it for the purposes of Country Hills Boulevard Functional Planning Study, subject to the following conditions:

1. All recommendations and mitigation measures outlined in the PNSA must be followed through all planning and development stages, particularly for the areas of the Project where no additional impact assessment is recommended.
2. Any changes to the project design for which the PNSA was prepared may trigger requirements to update the PNSA and/or complete additional studies.

Before finalizing, please make the following edits:

3. Adjust the bird nesting window end date to match the window that the City of Calgary has adopted based on discussions with Environmental Canada and Alberta Environment (to August 20) as noted in Section 5.1.2. The early time period is inconsistently reported in the document (sometimes February, March or April). Please edit to be consistent.
4. In Table 2, in each case where it is stated as “typical mitigation implementation”, please refer to Table 6.1.

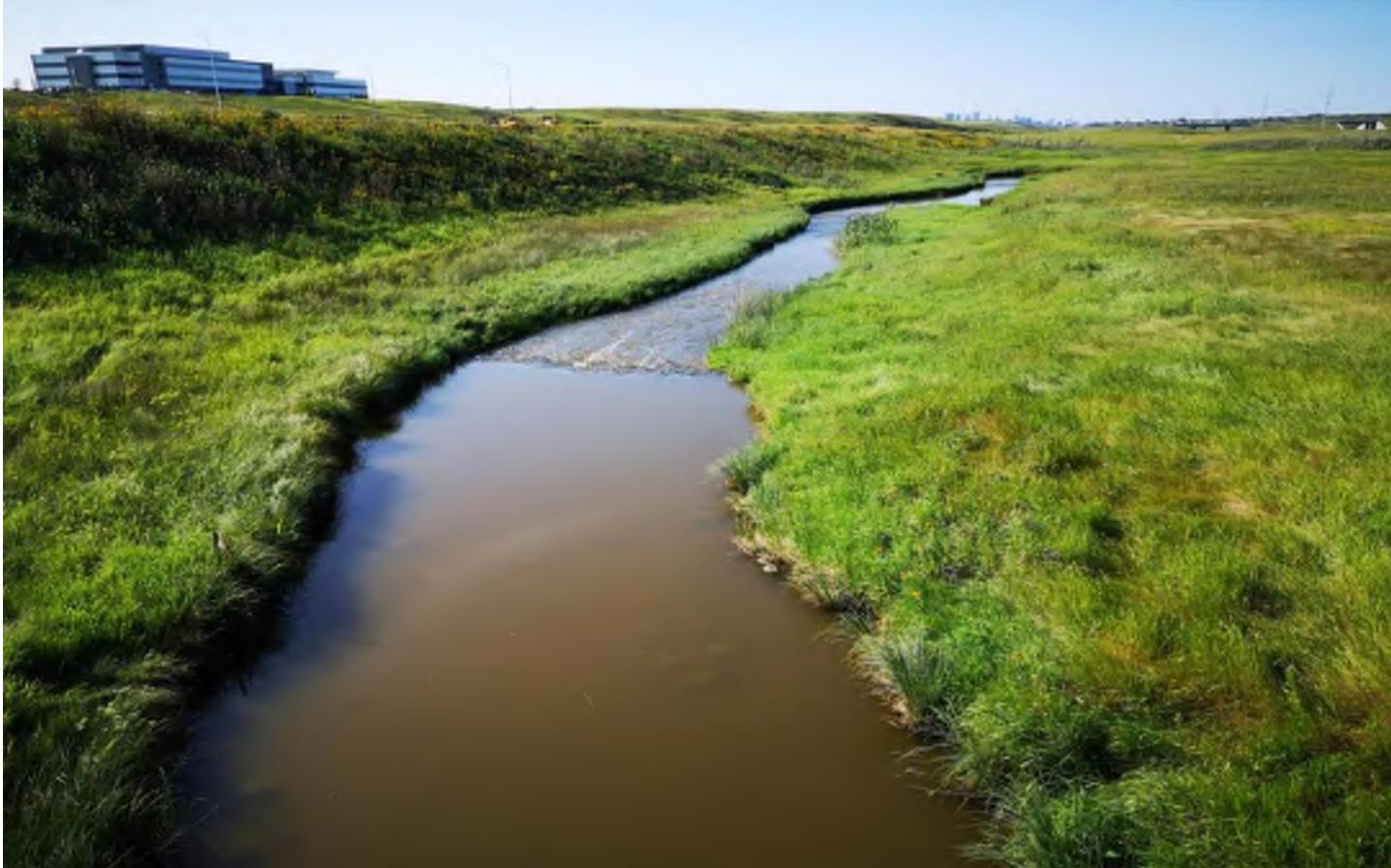
Please contact the following with any questions, comments or concerns.

Regards,

A handwritten signature in black ink that reads "Stefan".

Carol Stefan, M.Sc, P.Biol.
Parks Ecologist
Urban Conservation, Parks
T: 403.268.2819 | F: 403.268.5278 | calgary.ca/parks

C.C. Dave Hayman, City of Calgary Parks
Heather Leonhardt, City of Calgary Transportation Planning



Preliminary Natural Site Assessment – Country Hills Boulevard Functional Planning Study

The City of Calgary | Project 27422

October 2019



27422

The City of Calgary

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For additional Information regarding this report
please contact:

Brent Piche
Environmental Scientist

ISL Engineering and Land Services
4015 7 Street SE
Calgary, AB T2G 2Y9
T: 403.254.0544 F: 403.254.9186
B.Piche@islengineering.com

islengineering.com

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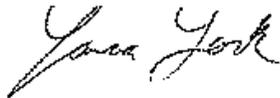
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Sincerely,

ISL Engineering and Land Services Ltd.

Author:



Laura York, B.Sc.,
Environmental Scientist

Reviewer:



Brent Piche, B.Sc., P. Biol, R.P. Bio.,
Environmental Scientist



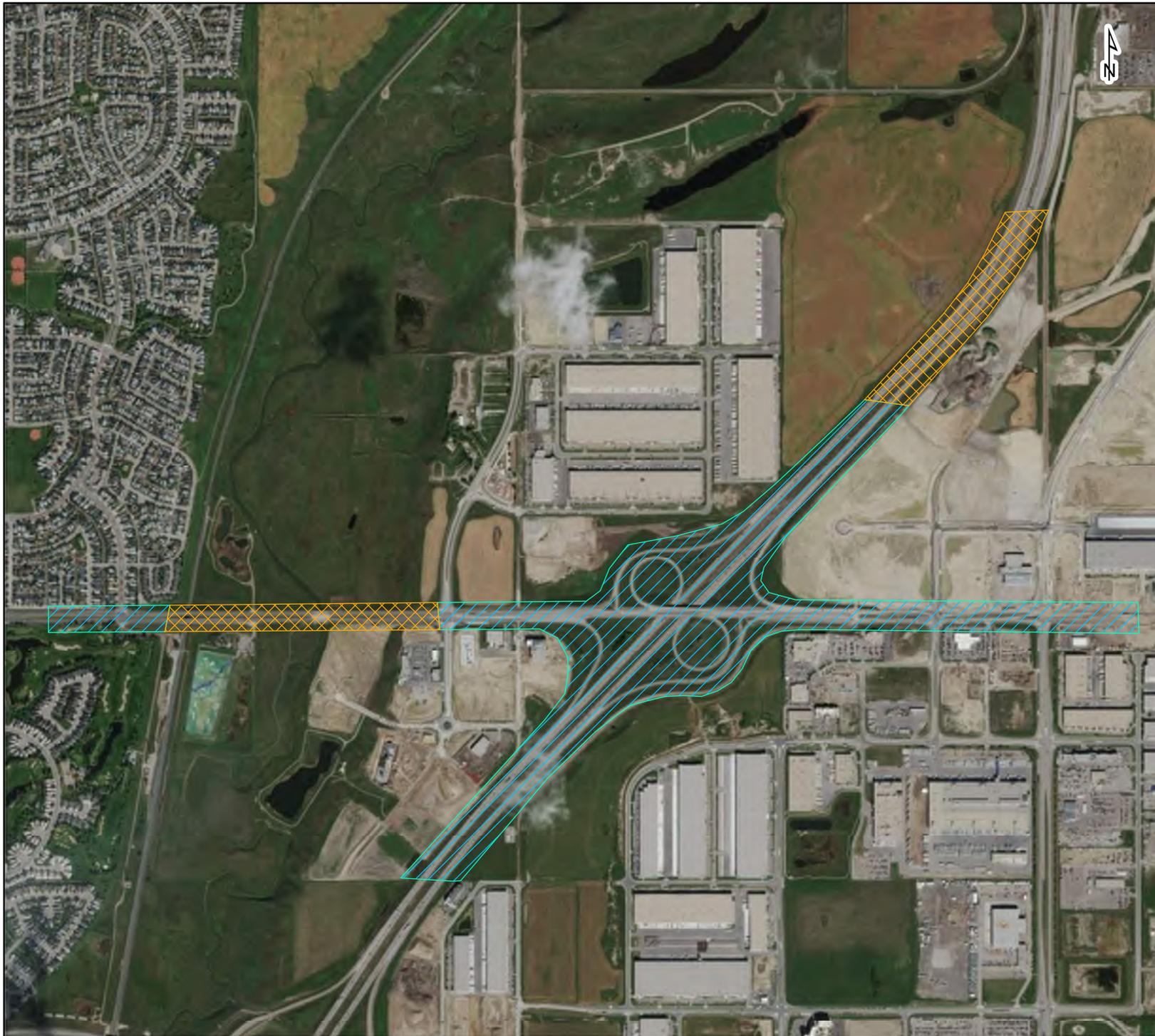
Executive Summary

The City of Calgary is proposing to widen Country Hills Boulevard from four to six lanes from Coventry Boulevard to Barlow Trail (The Project) in NW Calgary, Alberta. As part of the Project, the City requires a cohesive functional plan for the corridor and investigate associated bridge upgrades required to widen the corridor to six lanes across Deerfoot Trail and review bridge widening to add a 4 m pathway over Nose Creek and the CP Rail tracks. As part of the functional plan, a Preliminary Natural Site Assessment (PNSA) has been completed to determine if and where further biophysical review is required.

This document is organized with the PNSA Main Table as the base document with further appendices to describe and inform the information presented in the table. This format is at the request of City of Calgary Parks.

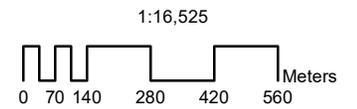
The Project is expected to interact with existing natural ecosystem components including, vegetation and wildlife, in limited locations through the Project area (See Figure below). Potential interactions with these environmental elements can be addressed fully through mitigative measures, which would be determined in future Biophysical Impact Assessments (BIA), where required.

Further biophysical analysis (i.e., a Level 3 BIA) is required for the detailed design phase of the Project where the Project interacts with the Nose Creek valley and/or the wetland areas along the northern portion of the interchange with Deerfoot Trail (see Figure below). No further study is required where no or limited natural features exist, or where impacts can be avoided (e.g., a cantilevered bridge off the existing Nose Creek crossing structure may negate a Level 3 BIA, pending review with Parks). All further BIA work should be completed following scoping and consultation with Parks.



Biophysical Level Likely Required

-  LEVEL 3 BIA
-  No Further Study



COUNTRY HILLS BOULEVARD
WIDENING PROJECT
BIOPHYSICAL STUDY LEVELS





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Table 1: Preliminary Natural Site Assessment

Project Description and Baseline Information			
Project Scope	Project Name	Country Hills Boulevard Widening Functional Planning Study	Project Size: Approximately 775,529 m ²
	Project Description	The Project will provide a cohesive functional plan for the corridor and investigate associated bridge upgrades required to widen the corridor to six lanes across Deerfoot Trail, Nose Creek and the CP Rail tracks.	
	Location	Country Hills Boulevard, North East Calgary	
	Project Purpose	1. Confirm network requirements to accommodate the many area development initiatives in terms of traffic capacity and access management. 2. Identify strategy to widen Country Hills Boulevard to six lanes to increase capacity and improve circulation. 3. Review the three crossing locations along the CHB corridor and recommend rehabilitation / widening of bridges, replacement of bridges and/or additional bridges. 4. Develop an updated cost estimate for the proposed infrastructure, and identify logical and practical staging plans. 5. Develop a plan that is supported by area communities and developers, ultimately being approved by City Council and ready for advancement to future design stages.	
Project Administration	Proposed Construction Date	Start: N/A	
		PNSA Date: August, 2019	PNSA Performed by: ISL Engineering and Land Services
	Project Manager Division/Business Unit	City of Calgary Transportation Infrastructure	
Project Biophysical Information	Description of Biophysical Elements		
	Location of Project in proximity to (in meters)"		
	<ul style="list-style-type: none"> • Environmentally Significant Area containing: <ul style="list-style-type: none"> ○ Patch of Native Vegetation 	Native vegetation is within the Project area, typically located around Nose Creek and wetlands in the area. FPS level footprint overlaps with some areas of native vegetation directly.	
	<ul style="list-style-type: none"> • Waterbody: <ul style="list-style-type: none"> ○ Streams ○ Wetlands 	The proposed west end of the Project crosses over Nose Creek with an existing bridge, which does not require additional Project work. The proposed Project may impact up to 5 wetland areas, depending on detailed design. FPS level footprint overlaps directly with one wetland.	
	• Spatially continuous wildlife corridor	A wildlife corridor with potential native habitat runs north-south, and is intersected by Country Hills Boulevard. Patches of native vegetation in Project near Nose Creek.	
	• Unique landscape feature	n/a; no unique landscape features (e.g., rock outcrops) are present	
	• Known contaminated site	Contaminated sites are unknown at this time. A Phase I Environmental Site Assessment is being conducted concurrently, to be released September 2019.	
	• Presence of listed species at risk or species of special status (plant and/or wildlife) or habitat located within the project area.	Six sensitive, May be at Risk or At Risk wildlife species, Two federally listed species of special concern (Short-eared owl, Northern leopard frog) and one sensitive vegetation element have historical occurrences within 2 km of the Project, however would be limited in their relevant habitat presence within the Project Area	
Regulatory Information	Has the proponent consulted with relevant municipal, provincial and federal departments/agencies? Are there issues of concern? No consultation has been completed at the Functional Planning Stage, and would be completed during detailed design.		

Table 2: Potential Biophysical Impacts

Potential Biophysical Impacts					
Environmental Elements	Project Interaction (Y/N/U)	Description of Interaction (How, When, Where)	Significant Rating (High /Med/Low)	Type of Potential Impact	Potential Residual Adverse Impact
Topography	Y	Topography along the Project Area is generally flat. Moderate to steep embankments occur along the edges of the Nose Creek River Valley. Topography (slope and aspect) will not change with the construction and grading within the Intersection Improvement Project Area.	Low	Overall topography will not change as a result of this project. Earthworks are planned to occur, however there is a low risk for erosion and sedimentation across the study area during construction.	Potential Impact, however expected to be limited in magnitude with typical mitigation implementation (see Table 6.1). No expected residual adverse impact.
Hydrogeology	Y	Construction of the Project involves grading and alteration of subsurface material locations, therefore there is potential to interact with groundwater during construction. The Project is unlikely to impact groundwater flows towards wetlands, as grading is unlikely to cause landscape level effects.	Low	There is potential through spills on stripped areas making its way to groundwater.	Potential Impact, however expected to be limited in magnitude with typical mitigation implementation (see Table 6.1). No expected residual adverse impact.
Aquatic Resources	Y	The Project Footprint appears to be within 50 m of wetlands, and may impact them directly depending on detailed design.	Medium	Wetlands may be impacted by construction, such as requiring small amounts of infilling and grading.	Potential Residual Impact
Geology / Geomorphology	N	Construction of the Project is not expected to interact with Geology/geomorphology, as only the topsoil and some subsurface material is to be removed.	N/A	No anticipated impact.	No Expected Interaction
Soils and Terrain	Y	Earthworks will occur during the construction of the Project. Admixing of soils has potential to occur, however given that this project is within a transportation corridor, and the historical photography record shows large scale soil movement, the soils are likely already disturbed. Erosion and sedimentation have potential to occur. Soils from outside the project area may be brought in.	Medium	Loss of topsoil through erosion and sedimentation. Potential admixing, dust issues and introduction of weeds.	Potential Impact, however expected to be limited in magnitude with typical mitigation implementation (see Table 6.1). No expected residual adverse impact.

Potential Biophysical Impacts					
Environmental Elements	Project Interaction (Y/N/U)	Description of Interaction (How, When, Where)	Significant Rating (High /Med/Low)	Type of Potential Impact	Potential Residual Adverse Impact
Vegetation	Y	No incidentally encountered rare plants or rare ecological communities were observed during the site visit. No historical rare vascular plant occurrences overlap the Project Area. An ACIMS database search returned one Sensitive Element Occurrence buffer on the Section that overlaps with the 2 km Study Area within 25-01-W5M. This habitat is concurrent with that of the Project Area, and this species may be encountered. Weed species are likely the main concern in the work area.	Medium	Transportation and introduction of weeds. Loss of rare plants or native plants. Loss of potential habitat for them.	Potential Impact that will be addressed through tender specs and in the detailed design phase, including the development of a restoration plan. No expected residual adverse impact.
Wildlife and Wildlife Habitat	Y	FWMIS identified 14 historical wildlife occurrences within 2 km (8 occurrences are fish). A potential wildlife corridor is intersected by the project, but the Project area is not considered critical or high value habitat for species at risk	Low	Construction activities may cause sensory disturbance to wildlife species, causing avoidance. It is unknown at this stage if shrubs or trees will be removed.	Potential Impact that will be addressed through tender specs and in the detailed design phase. Pre-construction nest sweeps will be required. No expected residual adverse impact.
Fish and Fish Habitat	N	The existing bridge over Nose Creek has been developed to meet future growth of Country Hills Boulevard (i.e., 6 lanes), and therefore no bridge works are expected. Interaction with Nose Creek will be limited to potential sedimentation for other work areas.	N/A	Construction activities will have no direct impact on fish and fish habitat, based on current understanding of Project requirements.	No Potential Residual Impact. No Expected Interaction
Species of Special Status (Provincial, Territorial, Local)	U	Six sensitive, May be at Risk or At Risk wildlife species, and one sensitive vegetation element have historical occurrences within 2 km of the Project, however would be limited in their relevant habitat presence within the Project Area.	Low	Construction activities may cause sensory disturbance to wildlife species, causing avoidance. It is unknown at this stage which if any shrubs or trees will be removed, however potential wildlife habitat in the Project Area is small and adjacent to a busy road, and therefore low quality.	Potential Impact that will be addressed through tender specs and in the detailed design phase. Pre-construction nest sweeps will be required, depending on construction timing. Habitat presence would be confirmed in future BIAs where habitat may be present (e.g., wetland or waterbody impacts)



Potential Biophysical Impacts					
Environmental Elements	Project Interaction (Y/N/U)	Description of Interaction (How, When, Where)	Significant Rating (High /Med/Low)	Type of Potential Impact	Potential Residual Adverse Impact
Species at Risk	U	Two federally listed species of special concern (Short-eared owl, Northern leopard frog) were identified within 2 km of the Project, however would be limited in their relevant habitat presence within the Project Area. .	Low	Construction activities may cause sensory disturbance to wildlife species, causing avoidance.	Potential Impact. Preconstruction surveys will provide appropriate mitigation measures to protect at risk species. Habitat presence would be confirmed in future BIAs where habitat may be present (e.g., wetland impacts) No expected residual adverse impact.
Historical and Archaeological	U	The Study Area is currently having a Historical Resources Overview (HRO) completed. This will determine if a Historical Resources Impact Assessment (HRIA) is required.	Low	Construction activities may incidentally locate historical resources, or impact previously unknown resources.	Potential Impact. The contractor will require a 'chance-find' procedure within their ECO plan, and a Historical Resource Clearance should be completed for the Project. No expected residual adverse impact.
Land and Resource Use	Y	The Project is within a transportation corridor. One paved pathway is located on the south side of Country Hills Boulevard and is not expected to be impacted by the Project. Pathway improvement on both sides of Country Hills Boulevard are planned.	Low	Construction activities may cause sensory (auditory and visual) disturbance to drivers, there may dust issues during construction and temporary pathway closures.	Potential Impact, however expected to be limited in magnitude with typical mitigation implementation (see Table 6.1). No expected residual adverse impact.



Table 3: Further Biophysical Impact Assessment Requirements Matrix

No Further Biophysical Impact Assessments Required?	Level 2 Required (Environmental Screening)	Level 3 Required (Scope BIA)
Level 3 required, with potential Wetland Functional Assessment. See Figure 6.1 for location details.	No	Yes. See Figure 6.1 for location details.
Wetland Functional Assessment Required?		
Yes		



APPENDIX
Preliminary Natural Site Assessment

A



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1.0 Introduction

1.1 Background

With the existing traffic congestion and planned growth along the corridor, the widening of Country Hills Boulevard from four to six lanes from Coventry Boulevard to Barlow Trail is a critical project for The City of Calgary (The City). As part of the Project, the City requires a cohesive functional plan for the corridor and investigate associated bridge upgrades required to widen the corridor to six lanes across Deerfoot Trail and review bridge widening to add a 4 m pathway over Nose Creek and the CP Rail tracks. As part of the functional plan, a Preliminary Natural Site Assessment (PNSA) has been completed to determine if further biophysical review is required. The existing bridge over Nose Creek has been developed to meet future growth of Country Hills Boulevard (*i.e.*, 6 lanes), and therefore no vehicle bridge works are expected. A pedestrian bridge may be installed in the future along the side of the vehicle crossing, however the design of this is undetermined at this point.

ISL Engineering and Land Services Ltd. (ISL) has been retained by The City of Calgary (The City) to conduct a Level 1 Biophysical Impact Assessment (BIA) also known as a Preliminary Natural Site Assessment (PNSA) as part of the Country Hills Boulevard Widening Project (the Project), depicted on Figure 1.1.

This PNSA uses a desktop level analysis with a reconnaissance-level field visit to identify potentially sensitive biological and physical features on or adjacent to the Study Area that have potential to be impacted by the Project. The Study Area is defined as within 2.0 km of the Project footprint (Figure 1.1). Included in the PNSA is baseline environmental conditions pertaining to current land use, existing site conditions, vegetation communities, wildlife habitat and use, as well as species and areas of management concern.

Species of management concern are any that meet the following criteria:

- Species for which provincial and/or federal restricted activity periods or setback distances exist (Government of Alberta 2011)
- Species listed to be of Special Concern, Threatened, or Endangered under the *Species at Risk Act* (SARA; Government of Canada 2002), Committee on the Status of Endangered Wildlife (COSEWIC; Government of Canada 2015) and/or the Alberta Endangered Species Conservation Committee (ESCC; Government of Alberta 2016)
- Species listed as Threatened or Endangered under Schedule 6 of the Wildlife Regulation of the Alberta *Wildlife Act* (Province of Alberta 2018)
- Wildlife species listed as Sensitive, may be at Risk, or At Risk, according to the General Status of Alberta Wild Species (GSAWS; Government of Alberta 2010)
- Previously identified fish and wildlife species provided by Alberta's Fish and Wildlife Management Information System (FWMIS; Alberta Environment and Parks 2019a)
- Vegetation species and ecological communities listed on the Alberta Conservation Information Management System (ACIMS) list of Tracked and Watched Elements (Alberta Environment and Parks 2017).

1.2 The City of Calgary Biophysical Impact Assessment Framework

The requirement for BIAs has been in place since the early 1990's as a requirement of the Calgary Municipal Development Plan. The BIA was incorporated into The City of Calgary Council approved Open Space Plan in 2002 (City of Calgary 2002). The purpose of the BIA Framework (City of Calgary 2010) is to provide a consistent process of review and approval of BIA reports ensuring equitability and transparency throughout City of Calgary Parks planning regions and other regulatory procedures. In addition, the BIA



Framework is established as a straightforward decision-making process to assist project proponents and environmental consultants to determine the appropriate level of BIA required with trigger mechanisms for assessing the appropriate level of BIAs required.

Projects that have the potential to incur negative impacts to identified Environmentally Significant Areas, Natural Environment Parks, and natural areas that qualify as Environmental Reserve will require at the very minimum a PNSA, which provides an overview of the project and the existing environmental conditions. After consultation with City of Calgary Parks, determination for further study is determined and can result in: no further study, an Environmental Screening, or a Scoped Level 3 BIA.



- Project Area
- Study Area (2km Buffer)

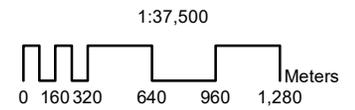


FIGURE 1.1
COUNTRY HILLS BOULEVARD
WIDENING PROJECT
 PROJECT OVERVIEW





2.0 Methodology

2.1 Desktop Review

2.1.1 Vegetation

ACIMS element occurrence data was reviewed to identify known rare plant and rare ecological community occurrences in the Study Area (figure 1.1).

2.1.2 Wildlife

SAGE Ecological Solutions Inc. (SAGE) was retained by ISL to conduct studies to satisfy the wildlife components. SAGE conducted a review of publicly available digital imagery to identify unique ecological landscape features and Alberta Environment and Parks (AEP) Fish & Wildlife Management Information System (FWMIS) database was queried to determine known species occurrences within an approximate 3 km radius of the Project footprint.

2.1.3 Fish

To determine the potential for fish habitat on the Project, a review of watercourse and waterbody information in the vicinity of the Project was completed and included a review of maps and the FWMIS.

2.1.4 Wetlands

A review of The Alberta Merged Wetland Inventory (AMWI) report were viewed to gain an understanding of the number, size, and location of potential wetlands, as well as the potential wetland classification. To further identify potential wetlands, an assessment of historical photographs and satellite imagery and a precipitation analysis was completed pursuant to the Alberta Wetland Identification and Delineation Directive (Government of Alberta 2015).

2.2 Reconnaissance Level Field Visit

A reconnaissance level field visit was conducted on August 15, 2019 to assess potential environmental concerns that could not be identified or may be missed at a desktop level.

2.2.1 Vegetation and Wetlands

The site visit was conducted by a Professional Biologist and Environmental Scientists on August 15, 2019. Habitat descriptions and incidental weeds observed were recorded during the reconnaissance level field visit and potential wetland areas identified during the desktop analysis were visited. The reconnaissance level field visit was conducted on foot.

2.2.2 Wildlife

A reconnaissance-level field visit was conducted to assess the potential for vertebrate species at risk, nesting or denning wildlife, migratory birds, and wildlife movement corridors to occur within or near the project footprint. Further details on methodology of the wildlife study is provided in **Appendix C**.

3.0 Desktop Results

3.1 Ecological Context

The proposed Project is located in the Foothills Fescue Subregion of the Grassland Natural Region (Natural Regions Committee [NRC] 2006). The Grassland Natural Region occupies approximately 14% (95,565 km²) of the province and the Foothills Fescue Subregion occupies approximately 14% (13,623 km²) of the Grassland Natural Region.

The Project lies within the northern portion of the Subregion. Native vegetation in this area is characterized by mountain rough fescue, Parry oat grass, and bluebunch fescue, along with a diverse herb component (NRC 2006). Approximately 50% of the Subregion is cultivated, while having the highest precipitation, the warmest winters, and the shortest growing season of all the Grassland Subregions. Wetlands are uncommon in this Subregion, occurring at approximately 3% of the Subregion, while other waterbodies account for approximately 1% of the Subregion area (NRC 2006). Major waterbodies include the Waterton, Bow, Oldman, and St. Mary rivers, with the largest waterbody being the St. Mary Reservoir (NRC 2006).

Agriculture is the primary land use in the Natural Subregion; however, cultivation ranges from 80% to 20% depending on elevation. Recreation and significant oil and gas activity also occurs within the foothills. The Project is located within an urbanized setting (northwest Calgary).

3.2 Vegetation

ACIMS element occurrence data was reviewed to identify known rare plant and rare ecological community occurrences in the vicinity of the proposed Project. Rare vascular plant species and rare ecological communities known to occur within the Foothills Fescue Natural Subregion are presented in Table 3.1.

An ACIMS database search returned one sensitive element occurrence that overlaps with the 2 km Study Area (ACIMS 2018a-c;2019a-b, **Appendix B**). Western blue flag (*Iris missouriensis*) is listed as Imperiled, implying this species has twenty or fewer occurrences, or is vulnerable to extirpation due to other factor. The western blue flag is mostly confined to the transition zone between riparian habitat and upland habitat in areas with high soil moisture in spring and dry conditions later in summer (Environment and Climate Change Canada 2017a). This habitat is concurrent with that of the Project footprint, adjacent to Nose Creek, and this species may be encountered. The last occurrence found was in 2009, so may no longer be present within the area.

ACIMS results are presented visually in Figure 3.1. Information on the provision of circular buffers around ACIMS occurrences is provided on the ACIMS website.

Table 3.1: Rare Plant Species and Ecological Communities Known to Occur within 2 km of the Project

Scientific Name	Common Name	Provincial Rank ¹	Global Rank ²	Typical Habitat	Habitat Presence
Vascular Plants					
<i>Iris missouriensis</i>	western blue flag	S2	G5	transition zone between riparian habitat and upland habitat in areas with high soil moisture in spring and dry conditions later in summer	Potential within riparian habitat around Nose Creek and wetlands. Presence would be confirmed in future BIAs

Sources: ACIMS 2018a,b,c; 2019a,b

Notes:
See Appendix B for Sources



-  Project Area
-  Study Area (2km Buffer)

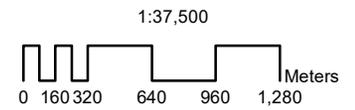


FIGURE 1.1
COUNTRY HILLS BOULEVARD
WIDENING PROJECT
PROJECT OVERVIEW



3.3 Wildlife

3.3.1 Regionally Significant Habitat

The proposed Project is not located within or in close proximity (*i.e.* 2 km) to any:

- Ramsar Wetlands of International Importance (Bureau of the Convention on Wetlands 2014)
- Migratory Bird Sanctuaries (Environment and Climate Change Canada 2017)
- World Biosphere Reserves (United Nations Educational, Scientific and Cultural Organization 2017)
- Western Hemisphere Shorebird Reserves (Western Hemisphere Shorebird Reserve Network 2019)
- Important Bird Areas (Bird Studies Canada and Nature Canada 2019)
- National Wildlife Areas (Government of Canada 2019)
- Ducks Unlimited Canada Projects (Ducks Unlimited Canada 2019)
- Provincial Parks or Ecological Reserves (Alberta Environment and Parks 2018)

3.3.2 Elements of Concern

An area of approximately 28 square kilometres was queried in the AEP FWMIS databases. This included a radius of 3 km from the approximated centre of the project boundary. Results of the FWMIS search included confirmed observations Canadian toad, great blue heron, long-tailed weasel, northern leopard frog, short-eared owl, and sora within the search area, provided in Table 3.2.

Based on desktop and field data combined with known habitat requirements and distributional ranges, a list of 26 vertebrate wildlife species of conservation concern was compiled and provided within **Appendix C**. It should be noted that although the project is within species at risk wildlife sensitivity areas for bald eagle, golden eagle, and prairie falcon and occurrences of great blue heron have been recorded in FWMIS within 2-km of the Project Boundary, suitable breeding or overwintering habitat for these species does not occur within the assessment area. Where a Level 3 BIA is required (e.g., impacts to wetlands or Nose Creek), specific wildlife survey assessments should be implemented to determine the presence of species of concerns.

See **Appendix C** for the wildlife report.

Table 3.2: Wildlife Species Records Occurring within the Study Area

Common Name	Scientific Name	Provincial Status ^{1,2}	Federal Status ³	Typical Habitat	Potential Habitat Presence
Birds					
Great blue heron	<i>Ardea herodias</i>	Sensitive	Not Listed	Marshes and riparian areas. ⁴	Potential presence in Nose Creek valley and wetlands, no breeding or overwintering habitats
Short-eared owl	<i>Asio flammeus</i>	May Be at Risk	Special Concern	Open fields and grasslands. ⁴	Limited due to urban areas
Mammals					
Long-tailed weasel	<i>Mustela frantata</i>	May Be at Risk	Not at Risk	Riparian woodlands, marshes, meadows and open pastures near forest or bush. ⁵	Potential presence in Nose Creek valley.
Red bat	<i>Lasiurus borealis</i>	Sensitive	Not Listed	Treed areas with relatively low human populations ⁵	Limited due to urban areas and limited tree presence.

Common Name	Scientific Name	Provincial Status ^{1,2}	Federal Status ³	Typical Habitat	Potential Habitat Presence
Amphibians and Reptiles					
Canadian toad	<i>Anaxyrus hemiophrys</i> ¹ <i>Bufo hemiophrys</i> ³	May Be at Risk	Not at Risk	Near ponds, lakes, wetlands. ⁷	Potential presence in Nose Creek valley and wetlands
Northern leopard frog	<i>Lithobates pipiens</i>	At Risk	Special Concern	Lightly treed or wooded areas adjacent to wetlands and lakes. ⁶	Extremely limited due to urban areas and limited tree presence.
Fish					
Brook stickleback	<i>Culaea inconstans</i>	Secure	Not Listed	Streams throughout Alberta, typically in silt and sandy areas ⁸	Confirmed presence within Nose Creek in Project area.
Fathead minnow	<i>Pimephales promelas</i>	Secure	Not Listed	Still water, typical depths of less than 2 m, submergent and emergent vegetation, as well as in-situ cover	Confirmed presence within Nose Creek in Project area.
Lake chub	<i>Couesius plumbeus</i>	Secure	Not listed	Swift flowing waters with gravel and boulder substrates, overhanging vegetation for cover	Confirmed presence within Nose Creek in Project area.
Longnose dace	<i>Rhinichthys cataractae</i>	Secure	Not listed	Swift flowing waters with gravel and boulder substrates, overhanging vegetation for cover	Confirmed presence within Nose Creek in Project area.
Longnose sucker	<i>Catostomus catostomus</i>	Secure	Not listed	Shallow water and around cover such as boulders and submergent and emergent vegetation	Confirmed presence within Nose Creek in Project area.
Pearl dace	<i>Margariscus margarita</i>	Undetermined	Not Listed	Swift flowing waters with gravel and boulder substrates, overhanging vegetation for cover	Confirmed presence within Nose Creek in Project area.
Prussian carp	<i>Carassius gibelio</i>	Invasive species	Invasive species	Invasive species, present in slow moving waters where introduced	Confirmed presence within Nose Creek in Project area.
White sucker	<i>Catostomus commersoni</i>	Secure	Not listed	Woody debris and shaded sections of streams	Confirmed presence within Nose Creek in Project area.

Notes:

1. Alberta Environment and Parks, 2015.
2. Alberta general status ranks are based in part on ACIMS ranks but are only updated every five years while ACIMS ranks are updated annually; the general status ranks are therefore not considered to be current nor particularly informative for the purposes of this report. The current general status ranks of these species were reviewed, but have not been included in this report
3. SARA status retrieved from Species at Risk Registry, 2019
4. Cornell University, 2019.
5. Canadian Wildlife Federation, 2019.
6. Alberta Institute for Wildlife Conservation. 2019.
7. Alberta Conservation Association. 2010.
8. Langhorne et. al., 2001.

3.4 Fish

The Project crosses over Nose Creek (Waterbody ID 1248), a Class C waterbody under Alberta Environment's Code of Practice for Watercourse Crossings (Alberta Government 2019). Nose Creek has a Restricted Activity Period (RAP) from April 1 to May 31. The intent of RAPs is to protect fish, their eggs and juveniles and habitats from harm, through avoidance or full mitigation of any potentially harmful activities. The Contractor should plan their work to avoid RAPs.

Two previous aquatic habitat surveys have been performed on Nose Creek at the Project Footprint, as per FWMIS results, indicating the presence of fish habitat within the Project footprint. See Table 3.2 for fish species that are located within 2 km of the Project and are expected to be present within the Project Area if work occurs over Nose Creek.

3.5 Waterbodies

3.5.1 Watershed

The Project is located within the South Saskatchewan Watershed and the Bow River Sub Basin. The largest tributaries to the South Saskatchewan River include the Oldman, Bow, and Red Deer Rivers. The river basin begins in the Rocky Mountains (Banff National Park) and flows east through the prairies to Saskatchewan. The South Saskatchewan River Basin is approximately 121,095 km² within Alberta (AEP 2019).

3.5.2 Alberta Merged Wetland Inventory

The AMWI is a merged dataset containing a number of wetland delineation products of varying resolution, age, and accuracy. It is not intended to replace fieldwork however, can be used to inform proponents of potential wetlands. Numerous wetland locations were provided by the AMWI mapping, provided in **Appendix D**.

3.5.3 Historical Imagery

Documentation of historical imagery and a precipitation analysis was completed pursuant to the Alberta Wetland Identification and Delineation Directive (Government of Alberta 2015) and is provided in Table 3.3. The mean precipitation database output at the level of the township is 409.17 mm (\pm 8.21 mm standard error of the mean). The highest yearly-accumulated precipitation recorded was in 1965 at 581.72 mm and the lowest in 1967 at 260.95 mm (Alberta Agriculture and Forestry 2019). Due to the quality of historical imagery, apparent error in georeferencing may be expected in older photos. The historical photographs are provided in **Appendix E**, with wetland delineations depicted as to reflect current imagery.

Five wetlands are located on or near the Project Footprint. North and south of Country Hills Boulevard are two wetlands, with the north wetland appearing to be intercepted by the Project footprint in two locations. The historical imagery provided guidance for the reconnaissance level field visit as to likely wetland locations. Other wetlands on private property and off the Project Footprint (e.g., on QEII) were delineated through historical photography and were not investigated further.



Table 3.3: Documentation of Precipitation and Historic Imagery

Air Photo Date ^{1,2} (Season)	Air Photo ID	Scale	Annual Precipitation ³	Monthly Precipitation ³	Daily Precipitation ³
2016-07-24 (Summer)	DS-2016200;64	1:15000	Above Average (428.27 mm)	Above Average (approx. 91.21 mm prior 2 weeks)	0 mm
2004-07-24 (Summer)	AS-5295-B;15	1:20000	Below Average (379.71 mm)	Below Average (approx. 19.18 mm prior 2 weeks)	0 mm
1988-09-01 (Winter)	AS-3695;241	1:20000	Approximately Average (415.06 mm)	Approximately Average (approx. 39.66 mm prior 2 weeks)	0 mm
1978-05-08 (Spring)	AS 2945;234	1:25000	Above Average (540.30 mm)	Below Average (approx. 39.66 mm prior 2 weeks)	0 mm
1971-10-01 (Fall)	AS-2945;150	1:12000	Approximately Average (407.30 mm)	Above Average (approx. 41.59 mm prior 2 weeks)	0 mm
1969-10-08 (Fall)	AS-1308;282	1:12000	Above Average (446.53 mm)	Above Average (approx. 11.69 mm prior 2 weeks)	0 mm
1962-00-00 (Winter)	AS-0830;206	1:31680	Below Average (297.46 mm)	Approximately Average (approx. 1.18 mm prior 2 weeks)	0 mm

- Notes: 1 Where collection date is available.
 2 All aerial imagery sourced from AEP's Aerial Photo Record System (APRS) (AEP 2015) and are all black and white. See Appendix E for historic aerial photographs.
 3 All historical precipitation data from Alberta Agriculture and Forestry 2019.

4.0 Field Visit Results

The Project Area was visited August 15, 2019. The day of the field visit was a hot day with no cloud cover, and a slight breeze. Information gathered included photography of the Project Footprint, general vegetation community information including weeds, wetland presence, and any other incidental biophysical information. Photographs of the Project footprint are provided in **Appendix F** (Plate 1 to 9).

4.1 Vegetation

No incidentally encountered rare plants or rare ecological communities were observed during the field visit, however specific surveys for them were deemed not appropriate for this stage of the assessment.

Native Vegetation

Native vegetation observed during the site walk through was largely limited to the valley area along Nose Creek.

Unmanaged roadside

The majority of the Project Area was dominated by a mixture of smooth brome, crested wheatgrass and Kentucky bluegrass. Occasional weeds (e.g., perennial sow-thistle, Canada (creeping) thistle, nodding thistle) and non-native forbs (e.g., tartary buckwheat, stinkweed, yellow sweet-clover) were intermixed (Plate 7 in **Appendix F**).

Weeds

During the site walkthrough, five Noxious weeds as per the Alberta Weed Act (2010) were encountered; nodding thistle (*Carduus nutans*), scentless chamomile (*Tripleurospermum inodorum*), perennial sow-thistle (*Sonchus arvensis*), Canada (creeping) thistle (*Cirsium arvense*) and common toadflax (*Linaria vulgaris*) (Plate 7, and 20 to 22 in **Appendix F**).

4.2 Wildlife

The reconnaissance level wildlife assessment was completed by SAGE. Anthropogenic and manicured grassy areas are considered to provide low habitat quality as potential nesting, denning, or hibernacula sites. Habitat types with more dense vegetation including shrub and tree patches, and non-manicured grassland are assessed to provide low to moderate potential for nesting birds including raptors and migratory birds. Two potential raptor stick nests and two American robin nests were observed in patches on planted trees within the Country Hills Blvd-Highway 2 interchange area. Riparian habitat areas adjacent to Nose Creek and stormwater ditches hold low to moderate potential to support nesting migratory birds including waterfowl, shorebirds, and marsh birds. Riprap piled at the outfall at the Nose Creek crossing holds low to moderate potential for a snake hibernaculum site provided riprap is keyed in below frostline. No carnivore burrows or dens were discovered.

No wildlife trails were identified within the Project area; however, tracks and scat of coyote and deer were observed within treed and shrub patches in the Country Hills Blvd-Highway 2 interchange area. The amount of infrastructure development (i.e., roads, shopping areas, and residential areas) is high and availability of connected large habitat patches is low within and surrounding the project area, however Nose Creek is known to be an important north-south wildlife corridor.

See **Appendix C** for the full wildlife report.



4.3 Wetlands

Areas of potential wetlands identified through AMWI and historical aerial photography analysis were visited during the reconnaissance level field visit. Two wetlands were delineated in the field, the south wetland outside but adjacent to the Project footprint, and the north wetland is overlapping the Project Footprint. (Plate 17 to 19; 24 to 29 in **Appendix F**).

South Wetland

The wetland to the south of Country Hills Boulevard and west of Nose Creek appears to be an old oxbow of Nose Creek. This wetland was dominated by foxtail barley, wire rush and perennial sow-thistle. The closest edge of this wetland is approximately five metres away from the Project Footprint.

North Wetland

The wetland on the north side of Country Hills Boulevard and east of Nose Creek is a large complex and appears to be fed through a spring or seepage from the hill on the east side of the Nose Creek valley. It has been altered in the past, with two dugouts and drainage channels directing water flows. The north wetland was dominated by sedge, perennial sow-thistle, tufted hair-grass and various bryophytes. The closest edge of this wetland overlaps with the Project Footprint by approximately two metres.

5.0 Regulatory Requirements

5.1 Federal

5.1.1 Species at Risk Act

The *Species at Risk Act (SARA)* includes several prohibitions to protect species listed on Schedule 1 of SARA. Under Sections 32 and 33 of SARA, it is an offence to:

- Kill, harm, harass, capture, or take an individual of a species listed under SARA as extirpated, endangered, or threatened.
- Possess, collect, buy, sell, or trade an individual of a species listed under SARA as extirpated, endangered, or threatened, or any part or derivative of such an individual.
- Damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada.

No SARA permit is expected or required for the Project, as no SARA listed species are expected to be impacted by the Project.

5.1.2 Migratory Birds Convention Act

The *Migratory Birds Convention Act (MBCA)* is administered by Environment and Climate Change Canada (ECCC) to ensure protection of migratory birds, their nests, and their eggs. Birds protected by the *MBCA* include waterfowl (such as ducks, geese, and swans), insectivorous birds (such as wrens, robins, shrikes, and woodpeckers), and some nongame birds (such as herons and gulls) (ECCC 2018). The federal *MBCA* establishes an absolute prohibition on incidental take of migratory birds, their nest and eggs, so mitigation must be completed to avoid incidental take.

To protect migratory birds, ECCC provides general nesting periods based on geographic location (ECCC 2018). The general nesting period covers the majority of species covered under the *MBCA*; however, it may not be accurate for species that can breed at any time during optimal conditions (e.g. crossbill species), or species that may nest earlier or later (ECCC 2018). It is important to note that this period may not include those nesting periods for species not covered under the *MBCA* but are covered under Alberta's *Wildlife Act*.

The general migratory bird-nesting period for the Project (located within zone B4) is mid-April to late August (ECCC 2018). The City of Calgary uses April 15 to August 20 for the bird RAP (with consideration for species that may nest outside this period, e.g., great-horned owl). The best management practice should be to avoid work within the nesting period, or to clear areas outside side of the nesting period to allow for work to continue through the bird RAP. During the RAP, a nest sweep should be completed as a due-diligence measure to avoid incidental take. The City requires that construction must start within 7 days of the initial nest sweep and activities must not be stopped on site any longer than 4 days or another sweep must be conducted. In the event that nesting migratory birds are identified during the nest sweep, a setback may be identified through consultation with ECCC where feasible

5.2 Provincial

5.2.1 Water Act

The *Water Act* provides the legislative framework for the requirements for managing Alberta's water resources. Through Alberta Environment and Parks, the *Act* governs activities affecting waterbodies in Alberta, including construction, water diversions, and infilling of wetlands. *Water Act* approval is required to alter the flow or level of water; change the location of water; change the direction of water flow; cause the siltation of water; cause erosion of bed or shore of any waterbody; or if there is any anticipated effect on the aquatic environment



Any impacts to wetlands due to the Project will require a *Water Act* approval. Due to the bridge currently being in place, no *Water Act* Approval or Code of Practice is anticipated as being required for the bridge component of the Project.

5.2.2 Wildlife Act

In addition to the federal MBCA, birds may be protected provincially under the *Wildlife Act*. AEP administers the *Wildlife Act*, which influences and controls human activities that may have adverse effects on wildlife or wildlife habitat on both Crown and privately-owned land. Section 36(1) of the *Wildlife Act* states that a person shall not willfully molest, disturb, or destroy a house, nest, or den of prescribed wildlife or beaver dam in prescribed areas and prescribed times. This applies to nests and dens of endangered wildlife, migratory birds, snakes (except prairie rattlesnakes), bats, and prairie rattlesnake hibernacula. Additionally, Section 36(1) also applies to beaver dens and houses on land that is not privately owned as well as houses, nests, and dens of all wildlife in a wildlife sanctuary and nests of game birds in game bird sanctuaries. As a result of the *Wildlife Act*, setbacks and Restricted Activity Dates (RADs) have been defined for important species.

RADs are based on existing knowledge of species-specific seasonal life history traits such as breeding, nesting, and rearing activities. Generally, inter-annual climate variation is captured within the dates; however, there may be occurrences where the RAD does not cover the entire trait (i.e. young still in the nest) (Government of Alberta 2011). As a result, the RAD should be extended to avoid disturbance. Setback distances are based on thresholds where human disturbance will adversely affect key wildlife areas or sites (Government of Alberta 2011).

Table 5.1 describes the level of anticipated disturbance (i.e. low, medium, and high) that affects setback distances (Government of Alberta 2011).

Table 5.1: Level of Disturbance for Setback Distances

Level of Disturbance	Explanation
Low	Infrequent, low-impact, no habitat modification, and short duration (i.e. hours). An example of this level of activity is land surveying.
Medium	High frequency, with some vehicles and equipment, minor habitat alteration, moderate duration (i.e. days). An example of this level of activity is seismic drilling or pipeline construction.
High	High frequency, vehicles and equipment, permanent modification of vegetation, soils, and/or hydrology, long duration (i.e. more than 10 years). An example of this level of activity is permanent road construction or flood rehabilitation.

Setbacks for the Project will be dependent on the species present and their location compared to the Project area. Please refer to the wildlife report and the recommendations provided in it (**Appendix C**).

5.2.3 Weed Control Act

The *Weed Control Act* protects stakeholders from economic and invasive losses caused by weeds. Some weed species exhibit extreme growth habits, which can have consequences for line of sight at intersections, wildlife control along roadways, culvert and outfall maintenance, agricultural production, livestock forage quality, and many others. The *Act* prescribes activities that must be undertaken, should a noxious or restricted weed be encountered. Each municipality is responsible for administering the *Act*, and as part of the Project, the Contractor shall be required to complete weed control.

Pre- and post-construction weed control is recommended during the construction phase of this Project.

5.2.4 Public Lands Act

The *Public Lands Act (PLA)* requires surface disposition be issued for the use of all public lands in Alberta. The *Act* is responsible for administering lands owned by the Crown. Under Section 3 of the *Act*, public lands include the bed and shore of all permanent and naturally occurring waterbodies, including wetlands, unless the title has been granted to a private landowner. The bed and shore of Nose Creek within The City of Calgary is considered Crown Land. The wetlands within the Project area are not likely to be considered crown-claimable, however this should be confirmed during the detailed design phase of the Project.

A Department License of Occupation (DLO) or Temporary Field Authorization (TFA) may be required for the alteration of a Crown claimed area.; therefore, a disposition (*i.e.* DLO) would be required under the *PLA* for the permanent placement of any materials within the bed and shore of Nose Creek, or a TFA for any temporary works.

6.0 Mitigation Measures

Standard mitigation measures that can be implemented for road construction has been provided in Table 6.1. The purpose of providing mitigation at the functional planning stage is to provide general information for limiting impacts as the Project moves forward into preliminary and detailed design. Mitigation measures will be further examined, refined, removed and expanded upon, where needed, in future biophysical assessments (e.g. Level 3 Scoped BIA), the ECO Plan and the ESC Plan. While a full impact assessment (*i.e.*, determination of significance/consequence of residual effects) cannot be completed at a functional planning stage, this high-level impact assessment will provide direction for a future Level 3 BIA, however the assessment or portions thereof have potential to become obsolete as Project design is further developed.

Table 6.1: Standard Mitigation Measures

Environmental Elements	Standard Mitigation Measures	Potential Residual Impact
Topography	<ul style="list-style-type: none"> Work will be suspended during weather that could increase the potential for erosion and sedimentation. Monitor revegetation of side-slopes to ensure that adequate vegetation is in place to deter sedimentation of any waterbody Install effective erosion and sediment control measures before starting work to prevent sediment from entering the waterbody. During soil disturbance activities identify locations where gaps in snow, topsoil, and spoil, if needed, are to be created. Gaps are typically associated with terrain features (e.g., slope changes), and crossings (e.g. roads). Postpone grading until spring breakup if the spoil piles have frozen to an extent that would impair natural water drainage on site. Restore topography to return drainage patterns as close to original as possible. Conduct vegetation restoration with fast growing native species immediately after earthworks on slopes are complete, to help limit erosion. Consider planting plugs instead of seeding. Monitor areas of potential terrain instability following construction. Conduct remedial erosion control work, as needed 	No expected residual adverse impact
Hydrogeology	<ul style="list-style-type: none"> Select construction methods that require minimal dewatering. Do not install permanent sub surface cut-off or actively dewater site. Maintain equipment in good working conditions and ensure that equipment and vehicles are free of leaks. Do not wash equipment or machinery near any waterbody. Control wastewater from construction activities by diverting wastewater to confirmed upland locations. Prohibit fuel storage, re-fueling, or servicing of equipment within 30 m of any waterbody. Ensure no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides, or other chemicals are released on the ground or into any waterbody. Install oil and grit separators or other device for any water exiting paved areas to a stormwater facility. 	No expected residual adverse impact.
Aquatic Resources	<ul style="list-style-type: none"> Avoid in-water work during preliminary design. Maintain equipment in good working conditions and ensure that equipment and vehicles are free of leaks. Do not wash equipment or machinery near any waterbody. Control wastewater from construction activities such that wastewater does not enter a waterbody Prohibit fuel storage, refueling, or servicing of equipment within 30 m of any waterbody. Ensure no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides, or other chemicals are released on the ground or into any waterbody. install oil and grit separators or other devices for any water exiting paved areas to a stormwater facility. 	Potential Residual Impact (<i>i.e.</i>, if wetlands cannot be avoided, pending design)
Soils and Terrain	<ul style="list-style-type: none"> Ensure there is sufficient frost or low enough soil moisture to allow construction without causing excessive rutting or soil compaction. Monitor soil piles for erosion. Initiate erosion control (e.g., watering down, tackifier application), if warranted. Replace soil horizons in the order removed where applicable. Postpone replacing topsoil during wet weather or high winds to prevent damaging soil structure or causing erosion or excessive dust. Decompact compacted subsoils, temporary access roads and soils damaged during wet weather to the depth of compaction prior to topsoil replacement. If soils are wet, postpone decompaction until soils dry to ensure that compaction alleviation measures are effective. 	No expected residual adverse impact.



Environmental Elements	Standard Mitigation Measures	Potential Residual Impact
Vegetation	<ul style="list-style-type: none"> • Complete a restoration plan, as part of future Biophysical Assessments • Prior to construction, manage weeds located on the construction footprint during previous growing season. This is to additionally include locations of temporary workspace, staging and stockpile areas. • Do not park or store vehicles, equipment, materials or machinery on invasive plant infestations, on native grasslands, wetlands or within 30m of Nose Creek. If a weed infested area must be used for material or equipment storage, treat or remove invasive plants prior to use of the area. • Construction equipment must be clean and free of soil or vegetative debris before its arrival on the Project site to reduce the risk of weed introduction. Any equipment that arrives dirty, will not be permitted on the construction footprint. • Implement a post-construction monitoring program to monitor weeds at least twice during the growing season post construction for 2 years. • Use equipment that will avoid or reduce disturbance and deposition of debris off the construction footprint 	No expected residual adverse impact.
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> • Implement construction outside the general nesting period for raptors and migratory birds for this region, as well as early nesting species (i.e., April 15 to August 15) • Targeted surveys for Species of Conservation Concern (i.e., amphibian, bat, breeding bird, & raptor surveys) should be conducted at later stages of the development approval process or in a Level 3 Scoped BIA; • Avoid disturbance of natural habitats by minimizing work footprint to established rights-of-way, trails, pads, etc. • If an active nest or den is suspected within or near the work area during construction, establish a work buffer and contact a qualified wildlife biologist immediately. • Avoid disturbance of natural habitats by minimizing work footprint to established rights-of-way, trails, pads, etc. • Migratory bird breeding surveys should be completed by a qualified avian specialist. If breeding bird activity is observed, appropriate disturbance buffers should be implemented until young have fledged and left the nesting area. Results of the surveys should be provided in a Scoped Level 3 BIA. • Nose Creek crossing designs should create no increase in footprint (i.e., no further restriction) at the crossing of Nose Creek 	No expected residual adverse impact.
Fish and Fish Habitat	<ul style="list-style-type: none"> • Avoid new crossings (i.e., pedestrian) impacting the bed and shore of Nose Creek. • Prohibit fuel storage, refueling, or servicing of equipment within 30 m of waterbodies (i.e., Nose Creek) except where secondary containment and/or tertiary containment is provided. • Ensure no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides, or other chemicals are released on the ground or into any waterbody 	No interaction expected, unless new pedestrian bridge impacts bed and shore of Nose Creek (pending design).
Species of Special Status (Provincial, Territorial, Local)	<ul style="list-style-type: none"> • Complete species-specific surveys during future BIAs, to determine presence of Species of Special Status within Project area. • Implement construction outside the general nesting period for raptors and migratory birds for this region, as well as early nesting species (i.e., April 15 to August 20) • Avoid disturbance of natural habitats by minimizing work footprint to established rights-of-way, trails, pads, etc. 	No expected residual adverse impact. Habitat presence would be confirmed in future BIAs
Species at Risk	<ul style="list-style-type: none"> • Complete species-specific surveys during future BIAs, to determine presence of Species at Risk within Project Area. • Implement construction outside the general nesting period for raptors and migratory birds for this region, as well as early nesting species (i.e., April 15 to August 20) • Avoid disturbance of natural habitats by minimizing work footprint to established rights-of-way, trails, pads, etc. 	No expected residual adverse impact. Habitat presence would be confirmed in future BIAs
Historical and Archaeological	<ul style="list-style-type: none"> • Complete a Historical Resource Impact Assessment (HRIA), and follow mitigation measures required from results of HRIA, if determined required by Alberta Culture, Multiculturalism and Status of Women. • The Contractor will develop a chance-find procedure as part of their ECO plan, for the inadvertent find of a historical resource. 	No expected residual adverse impact.
Land and Resource Use	<ul style="list-style-type: none"> • Limit grading extent as possible to limit impacts to visual resources. • Include pathway connections through Project area to facilitate alternative-transportation options 	No expected residual adverse impact.



7.0 Conclusion

A Project Description and Baseline Information Worksheet has been completed for the Project, as per the BIA Framework (City of Calgary 2010). The Project is expected to interact with existing natural ecosystem components including, vegetation (i.e., weeds) and wildlife. Potential interactions with these environmental elements can be addressed fully through mitigative measures, except where the Project cannot avoid wetlands or Nose Creek, such that a Level 2 or 3 BIA should be completed in these areas.

Due to the complexity of these Projects and their ability to be split out to separate contracts, different expectations for further biophysical work would be required based on the location of the works. Figure 6.1, provided below, shows the expected areas that require additional BIA work due to the presence of wetlands or watercourses, as well as the areas that do not require additional studies.

Current expectation is that bridgework over Nose Creek will not be necessary due to the bridge having previously been built to the appropriate size (i.e. with an extra lane), and further biophysical analysis of the Nose Creek crossing itself will not be needed. If a new pedestrian crossing is required that has the potential to impact Nose Creek, then a scoped level 3 BIA is required occur for this area. Due to the proximity of the Project to wetlands, a Level 3 BIA is required to be completed during detailed design for this area following scoping with City of Calgary Parks.

Regulations which apply will depend on the detailed design and construction methodology and timing of the Project and may include: *Migratory Birds Convention Act*, *Water Act*, *Wildlife Act*, *Public Lands Act*, and the *Alberta Weed Control Act*.



Biophysical Level Likely Required

-  LEVEL 3 BIA
-  No Further Study

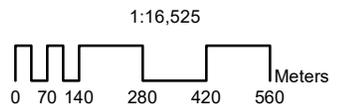


FIGURE 6.1
COUNTRY HILLS BOULEVARD
WIDENING PROJECT
BIOPHYSICAL STUDY LEVELS





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APPENDIX
ACIMS

B

Search ACIMS Data

Date: 22/8/2019

Requestor: Environmental Organization

Reason for Request: Environmental Reporting

SEC: 23 **TWP:** 024 **RGE:** 01 **MER:** 5



Non-sensitive EOs: 0 (*Data 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						

Sensitive EOs: 0 (*Data Updated:October 2017*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

Search ACIMS Data

Date: 22/8/2019

Requestor: Environmental Organization

Reason for Request: Environmental Reporting

SEC: 24 **TWP:** 024 **RGE:** 01 **MER:** 5



Non-sensitive EOs: 0 (*Data 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						

Sensitive EOs: 0 (*Data Updated:October 2017*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

Search ACIMS Data

Date: 22/8/2019

Requestor: Environmental Organization

Reason for Request: Environmental Reporting

SEC: 25 **TWP:** 024 **RGE:** 01 **MER:** 5



Non-sensitive EOs: 0 (*Data 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						

Sensitive EOs: 0 (*Data Updated:October 2017*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

Search ACIMS Data

Date: 22/8/2019

Requestor: Environmental Organization

Reason for Request: Environmental Reporting

SEC: 26 **TWP:** 024 **RGE:** 01 **MER:** 5



Non-sensitive EOs: 0 (*Data 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						

Sensitive EOs: 0 (*Data Updated: October 2017*)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas: 0 (*Data Updated: October 2017*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated: October 2017*)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

Appendix B: Rare Plant Species and Ecological Communities Known to Occur in the Foothills Fescue Natural Subregion

Scientific Name	Common Name	Provincial Rank ¹	Global Rank ²
Non-Vascular Plants			
<i>Riccia cavernosa</i>	liverwort	S2S4	G5
<i>Scapania glaucocephala</i>	glaucous-headed liverwort	S2S4	G4G5
<i>Aulacomnium androgynum</i>	little groove moss	S2S3	G5
<i>Sciuro-hypnum reflexum</i>	cedar moss	S2S3	G5
<i>Ptychostomum lonchocaulon</i>	moss	S1S2	G5?
<i>Tortula cernua</i>	narrow-leaved chain-teeth moss	S1	G3G5Q
<i>Hennediella heimii</i>	long-stalked beardless moss	S2S3	G5
<i>Didymodon fallax</i>	fallacious screw moss	S2S3	G5
<i>Drepanocladus brevifolius</i>	brown moss	SU	G5
<i>Fissidens grandifrons</i>	narrow-leaved Chinese phoenix moss	S2S3	G5
<i>Hygroamblystegium tenax</i>	moss	S1S2	G5
<i>Orthotrichum pallens</i> var. <i>pallens</i>	moss	S2S3	G5TNR
<i>Orthotrichum pumilum</i>	moss	S2S3	G5
<i>Physcomitrium hookeri</i>	bladder-cap moss	S2	G2G4
<i>Pterygoneurum ovatum</i>	hairy-leaved beardless moss	S2S3	G5
<i>Rhodobryum ontariense</i>	Ontario Rhodobryum moss	S1S2	G5
<i>Seligeria campylopoda</i>	moss	S2S3	G3G5
<i>Jaffuelobryum wrightii</i>	moss	S1S2	G4G5
<i>Chaenotheca chrysocephala</i>	stubble lichen	S2	G4G5
<i>Xanthomendoza montana</i>	sunburst lichen	S3	GNR
<i>Umbilicaria lyngei</i>	rock tripe	SU	G3
<i>Ramboldia elabens</i>	crimson dot lichen	S2	GNR
<i>Polysporina arenacea</i>	cobblestone lichen	S2	GNR
<i>Acarospora stapfiana</i>	cobblestone lichen	S1	GNR
<i>Caloplaca ahtii</i>	fireshield lichen	SU	GNR
<i>Caloplaca atroalba</i>	fireshield lichen	S1	GNR
<i>Candelariella rosulans</i>	goldspeck lichen	SU	G3G5
<i>Cladonia robbinsii</i>	yellow tongue cladonia	S2	G3G5

Non-Vascular Plants			
<i>Collema flaccidum</i>	jelly lichen	S1	G3G5
<i>Cyphelium notarisii</i>	soot lichen	S2	GNR
<i>Flavopunctelia soledica</i>	powder-edged speckled greenshield lichen	S2S3	G3G5
<i>Lecanora crenulata</i>	rim-lichen	S1	G3G5
<i>Lecanora meridionalis</i>	rim-lichen	S1	GNR
<i>Lepraria lobificans</i>	fluffy dust lichen	S2	G5
<i>Phaeospora parasitica</i>	lichen	S1?	GNR
<i>Physconia enteroxantha</i>	frost lichen	S3	G4G5
<i>Verrucaria glaucovirens</i>	speck lichen	S2	GNR
<i>Verrucaria muralis</i>	speck lichen	S2	G5?
<i>Phaeophyscia sciastra</i>	dark shadow lichen	S3	G5
<i>Psora tuckermanii</i>	brown-eyed scale	S2S3	G5
<i>Placidium lachneum</i>	earthscale lichen	S1S2	G5
<i>Dermatocarpon schaechtelinii</i>	stippleback lichen	S2	GNR
<i>Lecanora crenulata</i>	rim-lichen	S1	G3G5
<i>Lecanora meridionalis</i>	rim-lichen	S1	GNR
<i>Lepraria lobificans</i>	fluffy dust lichen	S2	G5
<i>Phaeospora parasitica</i>	lichen	S1?	GNR
<i>Physconia enteroxantha</i>	frost lichen	S3	G4G5
<i>Verrucaria glaucovirens</i>	speck lichen	S2	GNR
<i>Verrucaria muralis</i>	speck lichen	S2	G5?
<i>Phaeophyscia sciastra</i>	dark shadow lichen	S3	G5
<i>Psora tuckermanii</i>	brown-eyed scale	S2S3	G5
<i>Placidium lachneum</i>	earthscale lichen	S1S2	G5
<i>Dermatocarpon schaechtelinii</i>	stippleback lichen	S2	GNR
Vascular Plants			
<i>Bupleurum americanum</i>	thorough-wax	S2	G5
<i>Erigeron radicans</i>	dwarf fleabane	S3	G3G4
<i>Microseris nutans</i>	nodding microseris	S2	G5
<i>Almutaster pauciflorus</i>	few-flowered aster	S3	G4
<i>Cryptantha celosioides</i>	cock's-comb cryptantha	S2S3	G5

Vascular Plants			
<i>Heliotropium curassavicum</i>	spatulate-leaved heliotrope	S3	G5
<i>Mertensia lanceolata</i>	lance-leaved lungwort	S2	G5
<i>Lithospermum occidentale</i>	western false gromwell	S3	G4G5
<i>Boechera collinsii</i>	Collins' rockcress	S1	G5T5
<i>Boechera lemmonii</i>	Lemmon's rockcress	S3	G5T5
<i>Physaria spatulata</i>	spatulate bladderpod	S2S3	G5TNR
<i>Rorippa curvipes</i>	blunt-leaved watercress	S3	G5
<i>Rorippa tenerrima</i>	slender cress	S3	G5
<i>Corispermum pallasii</i>	Pallas' bugseed	S2	G4?
<i>Corispermum villosum</i>	hairy bugseed	S2	G4?
<i>Oxytropis lagopus</i> var. <i>conjugans</i>	hare-footed locoweed	S1	G4G5T3T4
<i>Ribes inerme</i> var. <i>inerme</i>	mountain gooseberry	S2?	G5T5
<i>Nemophila breviflora</i>	small baby-blue-eyes	S3	G5
<i>Epilobium campestre</i>	smooth boisduvalia	S3	G5
<i>Oenothera flava</i>	low yellow evening-primrose	S3	G5
<i>Polygonum bistortoides</i>	western bistort	S2	G5
<i>Phlox alyssifolia</i>	blue phlox	S2	G5
<i>Montia linearis</i>	linear-leaved montia	S2	G5
<i>Ranunculus glaberrimus</i>	early buttercup	S3	G5
<i>Crataegus castlegarensis</i>	Castlegar hawthorn	S1	G5
<i>Potentilla lasiodonta</i>	sandhills cinquefoil	S3	G3
<i>Conimitella williamsii</i>	conimitella	S2	G4
<i>Lithophragma parviflorum</i>	small-flowered rockstar	S2	G5
<i>Gratiola neglecta</i>	clammy hedge-hyssop	S3	G5
<i>Penstemon eriantherus</i>	crested beardtongue	S2	G4G5
<i>Pinus flexilis</i>	limber pine	S3	G4
<i>Carex crawei</i>	Crawe's sedge	S3	G5
<i>Carex vesicaria</i>	blister sedge	S1	G5
<i>Eleocharis engelmannii</i>	Engelmann's spike-rush	S2	G4G5
<i>Elodea bifoliata</i>	two-leaved waterweed	S2	G4G5
<i>Elodea canadensis</i>	Canada waterweed	S2	G5

Vascular Plants			
<i>Iris missouriensis</i>	western blue flag	S2	G5
<i>Lilaea scilloides</i>	flowering-quillwort	S3	G5?
<i>Camassia quamash</i> var. <i>quamash</i>	blue camas	S3	G5T4T5
<i>Triantha occidentalis</i> ssp. <i>montana</i>	western false-asphodel	S1	G5T5
<i>Cypripedium montanum</i>	mountain lady's-slipper	S2	G4
<i>Bouteloua curtipendula</i>	side-oats grama	S1	G5
<i>Spartina pectinata</i>	prairie cord grass	S2	G5
<i>Ruppia cirrhosa</i>	widgeon-grass	S3	G5
<i>Pellaea glabella</i> ssp. <i>simplex</i>	smooth cliff brake	S2	G5T4?

Sources: ACIMS 2018a,b,c; 2019a,b.

Notes:

- S1 (Critically Imperiled): Five or fewer occurrences, or especially vulnerable to extirpation due to other factor(s).
 S2 (Imperiled): Twenty or fewer occurrences, or vulnerable to extirpation due to other factor(s).
 S3 (Vulnerable): One hundred or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes, or other factor(s).
 S4 (Apparently Secure): Uncommon but not rare; potentially some cause for long term concern due to declines or other factors.
 S5 (Secure): Common, widespread, abundant.
 S_S_: Denotes the range of uncertainty about the status rank of the element.
 SU (Unrankable): Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
 S#? (Inexact Numeric Rank): Denotes inexact numeric rank
 SNA: Not Applicable because the species or ecosystems is not a suitable target for conservation activities (e.g., introduced species).
 T (Tracked): Current information suggest species is rare or of conservation concern.
- Global (G) ranks are based on species status world-wide and follow a system parallel to Provincial Ranks (Note 1).



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APPENDIX
Wildlife Report

C

Date: September 06, 2019
To: Brent Piche, ISL Engineering and Land Services Ltd.
Cc: Robyn Gamber, ISL Engineering and Land Services Ltd.
From: Nathan Erik, P. Biol, SAGE Ecological Solutions Inc.
File: Country Hills Boulevard Widening Functional Planning Study
Subject: Memorandum – Wildlife Assessment

1.0 Introduction

SAGE Ecological Solutions Inc. (SAGE) was retained in August 2019 by ISL Engineering and Land Services Ltd. (ISL) to conduct a wildlife assessment to be considered in the Country Hills Boulevard Widening Functional Planning Study (the Project). ISL is currently working on the Functional Planning Study for this project which includes the widening of Country Hills Boulevard and upgrades to the intersection of Country Hills Boulevard and Highway 2 in northeast Calgary. Desktop searches and a reconnaissance-level field visit field surveys were conducted in August 2019 to assess the occurrence of or potential for vertebrate species of conservation concern (to occur as resident the potential for vertebrate species at risk, nesting or denning wildlife (including migratory birds), and wildlife movement corridors to occur within or near the project boundary/assessment area (as provided by ISL; Appendix A). This memo report has been prepared to present methods and results of desktop and field investigations and to provide recommendations for future work that might be required for project approval by the City of Calgary (the City).

Figure 1: Estimated Project Footprint/Assessment Area



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2.0 Methods

Methods of investigation included desktop review of the project boundary provided by ISL as well as publicly available materials and field investigation by resource specialists. A review of publicly available digital aerial imagery was conducted to help identify any unique ecological landscape features and Alberta Environment and Parks' (AEP) Fish and Wildlife Management Information System (FWMIS) was queried to determine known species occurrences within a 2-km radius from the centre of the subject property. A single reconnaissance-level field visit was conducted on August 20, 2019 to investigate the property for sign of potential vertebrate species at risk, nesting or denning wildlife (including migratory birds), and wildlife movement corridors. Specific methods by resource component are listed below.

2.1 Potential for Vertebrate Species of Conservation Concern

A desktop review of available imagery and the Fisheries and Wildlife Management Information System (FWMIS) was conducted to determine the potential for vertebrate species of conservation concern (e.g., At-Risk species). A list of species of conservation concern with potential to reside, breed, or overwinter within the assessment area and to be affected by construction was produced using range and habitat requirements and FWMIS records.

2.2 Potential for Nesting or Denning Sites

A review of habitat quality, native integrity, and potential for nesting or denning was conducted using aerial imagery. A reconnaissance-level field survey was conducted to assess habitat quality and the occurrence of or potential for nesting or denning sites (e.g., bank swallow nesting areas, raptor nests, burrowing mammal dens, and bat or snake hibernacula, etc.).

2.3 Potential for Wildlife Movement

A desktop review of available imagery (and other materials) combined with a reconnaissance-level field visit were used to conduct a preliminary assessment of the potential for established wildlife corridors within and across the assessment area. Focus was placed on regional rarity of habitats or unique ecological features on the property, existing habitat fragmentation, and the potential for the property to sustain or enhance regional wildlife movement.

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3.0 Results

Results of desktop and field investigations are presented below by resource component.

3.1 Potential for Vertebrate Species of Conservation Concern

An area of approximately 28 square kilometres was queried in the AEP FWMIS databases. This included a radius of 3 km from the approximated centre of the project boundary. Results of the FWMIS search included confirmed observations Canadian toad, great blue heron, long-tailed weasel, northern leopard frog, short-eared owl, and sora within the search area (Appendix B). It should be noted that, although species occurrences have been recorded with three kilometres of the Project, they do not necessarily have potential to occur within the Project area at the time of construction due to species-specific habitat requirements.

The FWMIS search also identified that the property shows occurs within the following species at risk wildlife sensitivity areas:

- i) Sharp-tailed Grouse Survey Area
- ii) Sensitive Raptor Range – Bald Eagle
- iii) Sensitive Raptor Range – Golden Eagle
- iv) Sensitive Raptor Range – Prairie Falcon

Based on desktop and field data combined with known habitat requirements and distributional ranges, a list of 26 vertebrate wildlife species of conservation concern was compiled. These species have the potential to occur within the property before or during construction and spend some portion of their life cycle as resident, breeding, or overwintering. These species are listed in Table 1 and include three amphibian, three reptile, 16 bird, and four mammal species. It should be noted that although the project is within species at risk wildlife sensitivity areas for bald eagle, golden eagle, and prairie falcon and occurrences of great blue heron have been recorded in FWMIS within 3-km of the project boundary, suitable breeding or overwintering habitat for these species does not occur within the assessment area.

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Table 1 Vertebrate Species of Conservation Concern with Potential to Occur Within the Study Area

COMMON NAME	SCIENTIFIC NAME	STATUS			
		AEP	COSEWIC	SCHEDULE	SARA
Reptiles and Amphibians					
Canadian Toad	<i>Anaxyrus hemiophrys</i>	May Be At Risk	Not at Risk	No schedule	No Status
Northern Leopard Frog	<i>Lithobates pipiens</i>	At Risk	Special Concern	Schedule 1	Special Concern
Western Tiger Salamander	<i>Ambystoma mavortium</i>	Secure	Special Concern	No schedule	No Status
Western Terrestrial (Wandering) Garter Snake	<i>Thamnophis elegans</i>	Sensitive	-	-	-
Plains Gartersnake	<i>Thamnophis radix</i>	Sensitive	-	-	-
Red-sided Garter Snake	<i>Thamnophis sirtalis</i>	Sensitive	-	-	-
Birds					
Swainson's Hawk	<i>Buteo swainsoni</i>	Sensitive	-	-	-
American Kestrel	<i>Falco sparverius</i>	Sensitive	-	-	-
Short-eared Owl	<i>Asio flammeus</i>	May Be At Risk	Special Concern	Schedule 1	Special Concern
Common Nighthawk	<i>Chordeiles minor</i>	Sensitive	Threatened	Schedule 1	Threatened
Least Flycatcher	<i>Empidonax minimus</i>	Sensitive	-	-	-
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Sensitive	-	-	-
Sprague's Pipit	<i>Anthus spragueii</i>	Sensitive	Threatened	Schedule 1	Threatened
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Sensitive	Threatened	Schedule 1	Threatened
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Sensitive	-	-	-
Baird's Sparrow	<i>Ammodramus bairdii</i>	Sensitive	Special Concern	Schedule 1	Special Concern
Common Yellowthroat	<i>Geothlypis trichas</i>	Sensitive	-	-	-
Western Tanager	<i>Piranga ludoviciana</i>	Sensitive	-	-	-
Baltimore Oriole	<i>Icterus galbula</i>	Sensitive	-	-	-
Bobolink	<i>Dolichonyx oryzivorus</i>	Sensitive	Threatened	No Schedule	No Status
Bank Swallow	<i>Riparia riparia</i>	Sensitive	Threatened	Schedule 1	Threatened
Sora	<i>Porzana carolina</i>	Sensitive	-	-	-
Mammals					
Long-tailed Weasel	<i>Mustela frenata</i>	May Be At Risk	-	-	-
Eastern Red Bat	<i>Lasiurus borealis</i>	Sensitive	-	-	-
Western Small-footed Bat	<i>Myotis ciliolabrum</i>	Sensitive	-	-	-
Little Brown bat	<i>Myotis lucifucus</i>	May Be At Risk	Endangered	No schedule	No Status

3.2 Potential for Nesting or Denning Sites

The site was surveyed using aerial imagery and on foot for suitable habitat for nesting or denning of wildlife. Habitat on site consists of non-native or semi-native grassland with scattered patches of weedy forbs, anthropogenic (i.e., roads, pathways, facilities, transmission towers & lines, and active construction areas), manicured areas with planted native and non-native ornamental trees & shrubs, few small (<100 m²) patches of native and non-native shrub, stormwater ditches with graminoid hydrophytic species including cattail, sedge, and wire rush, and a crossing of Nose Creek and associated graminoid riparian habitat also

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including hydrophytic species. Due to the high level of daily human use (e.g., traffic) the potential for nesting or denning is degraded except for species with high tolerance to human disturbance.

Anthropogenic and manicured grassy areas are considered to provide low habitat quality as potential nesting, denning, or hibernacula sites. Habitat types with more dense vegetation including shrub and tree patches, and non-manicured grassland are assessed to provide low to moderate potential for nesting birds including raptors and migratory birds. Two potential raptor stick nests and two American robin nests were observed in patches on planted trees within the Country Hills Blvd-Highway 2 interchange area.

Riparian habitat areas adjacent to Nose Creek and stormwater ditches hold low to moderate potential to support nesting migratory birds including waterfowl, shorebirds, and marsh birds.

Riprap piled at the outfall at the Nose Creek crossing holds low to moderate potential for a snake hibernaculum site provided riprap is keyed in below frostline. No carnivore burrows or dens were discovered.

Representative photos of habitat types observed within the property boundary are provided in Appendix C.

3.3 Potential for Wildlife Movement

Wildlife corridors are defined as "linear landscape features that facilitate the biologically effective transport of animals between larger patches of habitat to accommodate daily, seasonal and dispersal movements" (Paquet et al. 1994.). Protection of routes for wildlife movement is important in order to provide safe travel opportunities between important habitats and to facilitate dispersal and population exchanges. Desktop and reconnaissance-level field investigations confirmed an overall lack of connected patches of habitat reducing the importance of the Project area for wildlife movement. However, the Nose Creek Watershed Management Plan (NCWP 2007) identifies the Nose Creek corridor as important for wildlife movement and connectivity to residual habitat patches within and outside the City. This document identifies that the maintenance of corridors is important for maintaining biological and genetic diversity and for reducing human-wildlife interactions (e.g., collisions).

No wildlife trails were identified within the Project area; however, tracks and scat of coyote and deer were observed within treed and shrub patches in the Country Hills Blvd-Highway 2 interchange area. These patches may provide thermal and hiding cover for medium to large bodied mammals but, as previously mentioned, connectivity is lacking for identification of these patches as part of an important interconnected corridor system.

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The amount of infrastructure development (i.e., roads, shopping areas, and residential areas) is high and availability of connected large habitat patches is low within and surrounding the project area. The Project area, outside of the importance of the Nose Creek valley, is not considered to be part of a regional wildlife movement corridor considering the historic and current trend of development.

4.0 Potential Impacts and Recommendations

Table 2 describes the potential impacts by resource associated with the proposed activities. Mitigation recommendations are provided to avoid or minimize impacts.

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 Page: 7 of 18



Table 2 Potential Impacts and Mitigation Recommendations

RESOURCE	PROJECT PHASE	POTENTIAL IMPACTS	MITIGATION RECOMMENDATIONS
Wildlife			
Species of Conservation Concern	Construction; Restoration	Disturbance to breeding or overwintering groups or individuals.	<ul style="list-style-type: none"> - Targeted surveys for Species of Conservation Concern (i.e., amphibian, bat, breeding bird, & raptor surveys) should be conducted at later stages of the development approval process; - Implement construction outside the general nesting period for raptors and migratory birds for this region (i.e., April 15 to August 20); - An inclusive wildlife sweep should be conducted by a qualified environmental specialist prior to construction to minimize risk of disturbance to breeding or overwintering wildlife. - Avoid disturbance of natural habitats by minimizing work footprint to established right-of-ways, trails, pads, etc.; - Work only within designated areas within the project work area; - If an active nest or den is suspected within or near the work area during construction, establish a work buffer and contact the undersigned immediately.
Migratory Birds	Construction; Restoration	Disturbance during the general nesting period (i.e., Mid-April to Mid-August).	<ul style="list-style-type: none"> - Implement construction outside the general nesting period for raptors and migratory birds for this region (i.e., April 15 to August 20); - Conduct vegetation clearing after late August and/or before March to avoid incidental take of migratory birds, nests, or eggs and to maintain compliance with the Migratory Birds Convention Act, the Species at Risk Act, and the Alberta Wildlife Act. - If clearing is required within known breeding periods, migratory bird breeding surveys should be completed by a qualified avian specialist. If breeding bird activity is observed, appropriate disturbance buffers should be implemented until young have fledged and left the nesting area.
Nesting or Denning Wildlife	Construction; Restoration	Disturbance of nesting or denning wildlife and their young.	<ul style="list-style-type: none"> - Implement construction outside the general nesting period for raptors and migratory birds for this region (i.e., April 15 to August 20); - An inclusive wildlife sweep should be conducted by a qualified environmental specialist prior to construction to minimize risk of disturbance to breeding or overwintering wildlife. - Avoid disturbance of natural habitats by minimizing work footprint to established right-of-ways, trails, pads, etc.; - Work only within designated areas within the project work area; - If an active nest or den is suspected within or near the work area during construction, establish a work buffer and contact the undersigned immediately.
Wildlife Movement	Construction; Restoration	Reduction of movement potential due to increased footprint; Direct mortality due to vehicle impacts.	<ul style="list-style-type: none"> - Nose Creek crossing designs should create no increase in footprint (i.e., no further restriction) at the crossing of Nose Creek - If possible, consider increasing span of crossing at Nose Creek if an updated design is to be created.

MEMORANDUM

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5.0 Recommendations

Where a Level 2 or 3 BIA is required, species specific inventories should be completed, with appropriate mitigation developed to limit impacts to wildlife that are confirmed within the Project area

We trust this meets your requirements at this time. Please do not hesitate to contact the undersigned at (403) 921-7057 or nathanerik@sage-eco.com with any questions or concerns

Sincerely,

A handwritten signature in blue ink, appearing to read "N. Erik", with a long horizontal flourish extending to the right.

Nathan Erik, P. Biol.
President | Professional Biologist | Environmental Planner
SAGE Ecological Solutions, Inc.



MEMORANDUM

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File: Country Hills Boulevard Widening Functional Planning Study
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5.0 Literature Cited

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COSEWIC. 2017. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada. Available at: http://www.registrelep.gc.ca/sar/index/default_e.cfm

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APPENDIX A
Drawings (ISL)

MEMORANDUM

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Appendix B
FWMIS Species Summary Report

MEMORANDUM

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Fish and Wildlife Internet Mapping Tool (FWIMT)

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

Species Summary Report

Report Created: 6-Sep-2019 11:10

Species present within the current extent :

Fish Inventory

BROOK STICKLEBACK
FATHEAD MINNOW
LAKE CHUB
LONGNOSE DACE
LONGNOSE SUCKER
PEARL DACE
PRUSSIAN CARP
WHITE SUCKER

Wildlife Inventory

CANADIAN TOAD
GREAT BLUE HERON
LONG-TAILED WEASEL
NORTHERN LEOPARD FROG
RED BAT
SHORT-EARED OWL
SORA

Stocked Inventory

No Species Found in Search Extent

Buffer Extent

Centroid (XY):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Radius or Dimensions
568251, 5665175	10-TM AEP Forest	SW 25 25 1 5	3 kilometers

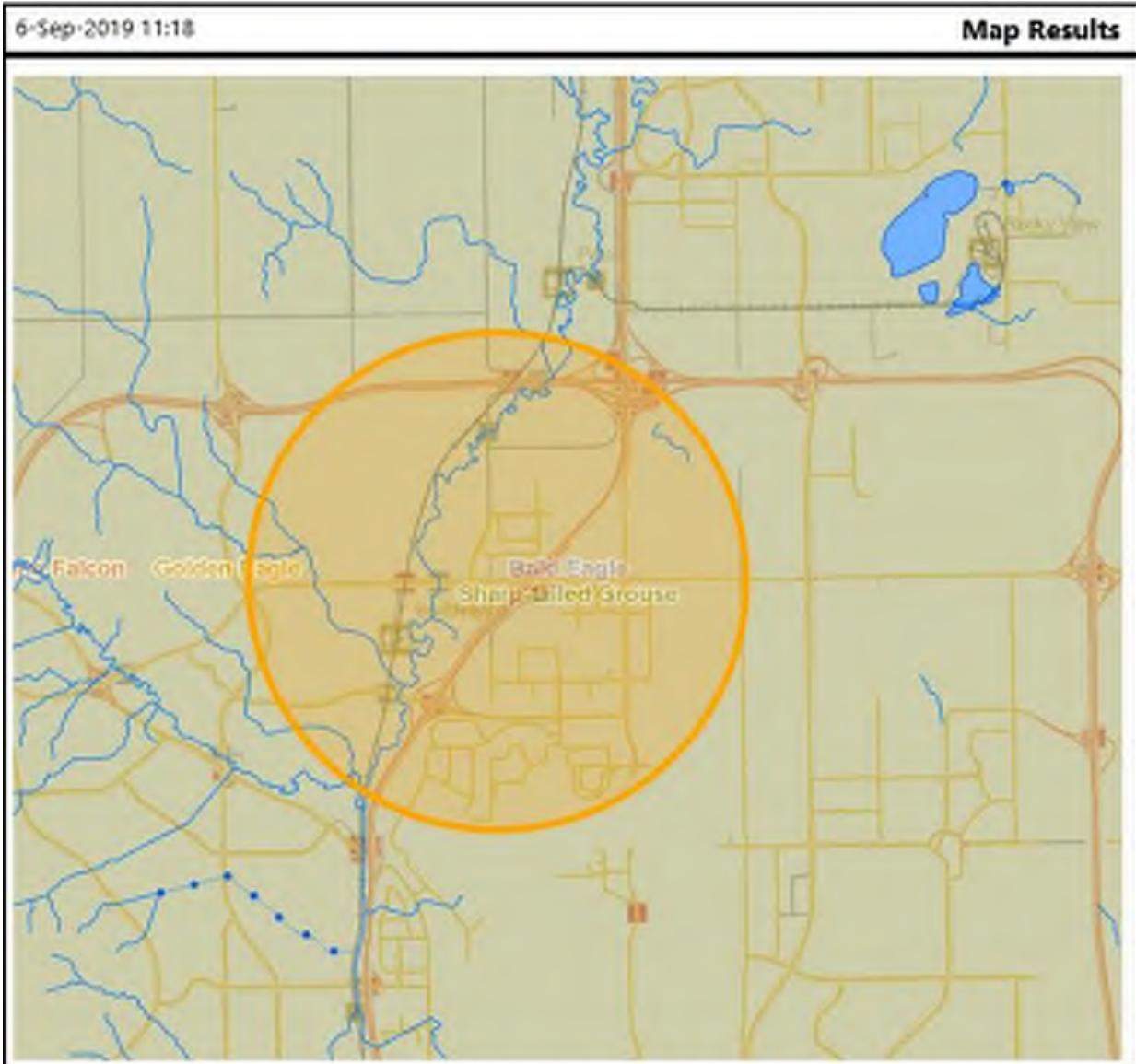
Contact Information

For contact information, please visit:

<http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx>

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Appendix C
Representative Site Photographs

MEMORANDUM

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IMG_4247 – Manicured grassland in foreground with treed patch adjacent to Highway 2 in background.



IMG_4250 – Treed patch with understory dominated by weedy forbs and reclamation grasses.

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IMG_4252 – Stick nest in spruce within treed patch.



IMG_4259 – Stormwater conveyance ditch dominated by hydrophytic graminoid species.

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IMG_4260 – Nose Creek crossing at Country Hills Blvd.



IMG_4261 – Riprap at stormwater outfall to Nose Creek (Country Hill Blvd); Potential snake hibernaculum site.



APPENDIX
Alberta Merged Wetland Inventory

D



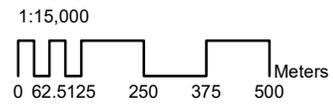
APPENDIX
Aerial Photos

E



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- Project Footprint
- Wetlands
- Dugouts



COUNTRY HILLS BOULEVARD
WIDENING PROJECT

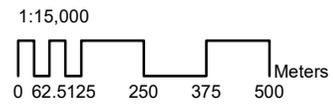
WETLANDS OVERVIEW
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-  Wetlands
-  Dugouts



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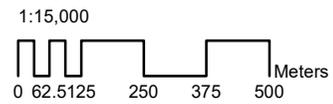
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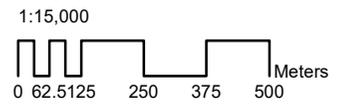
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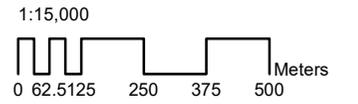
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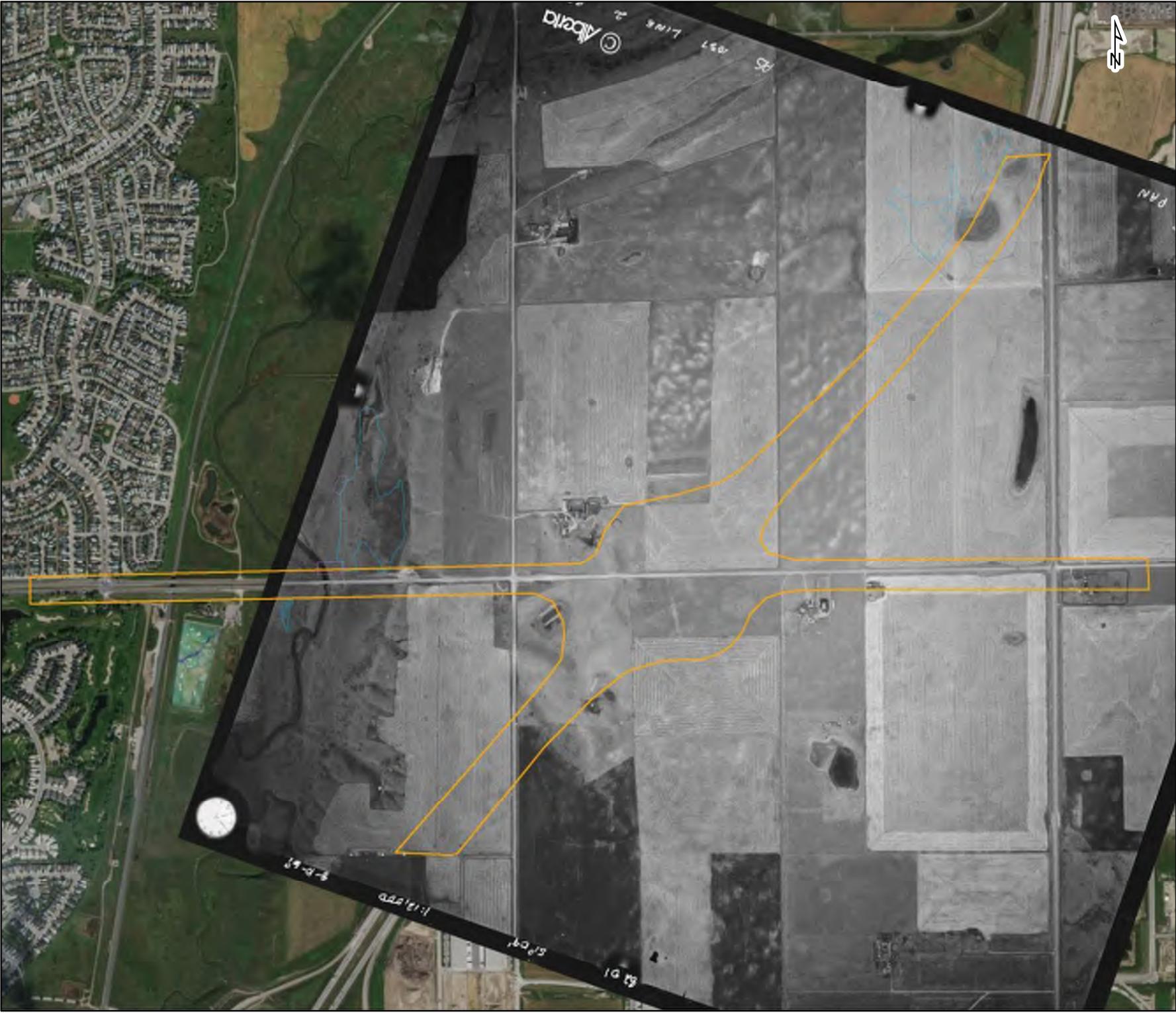
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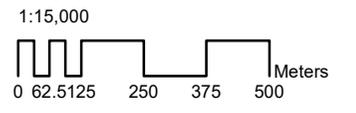
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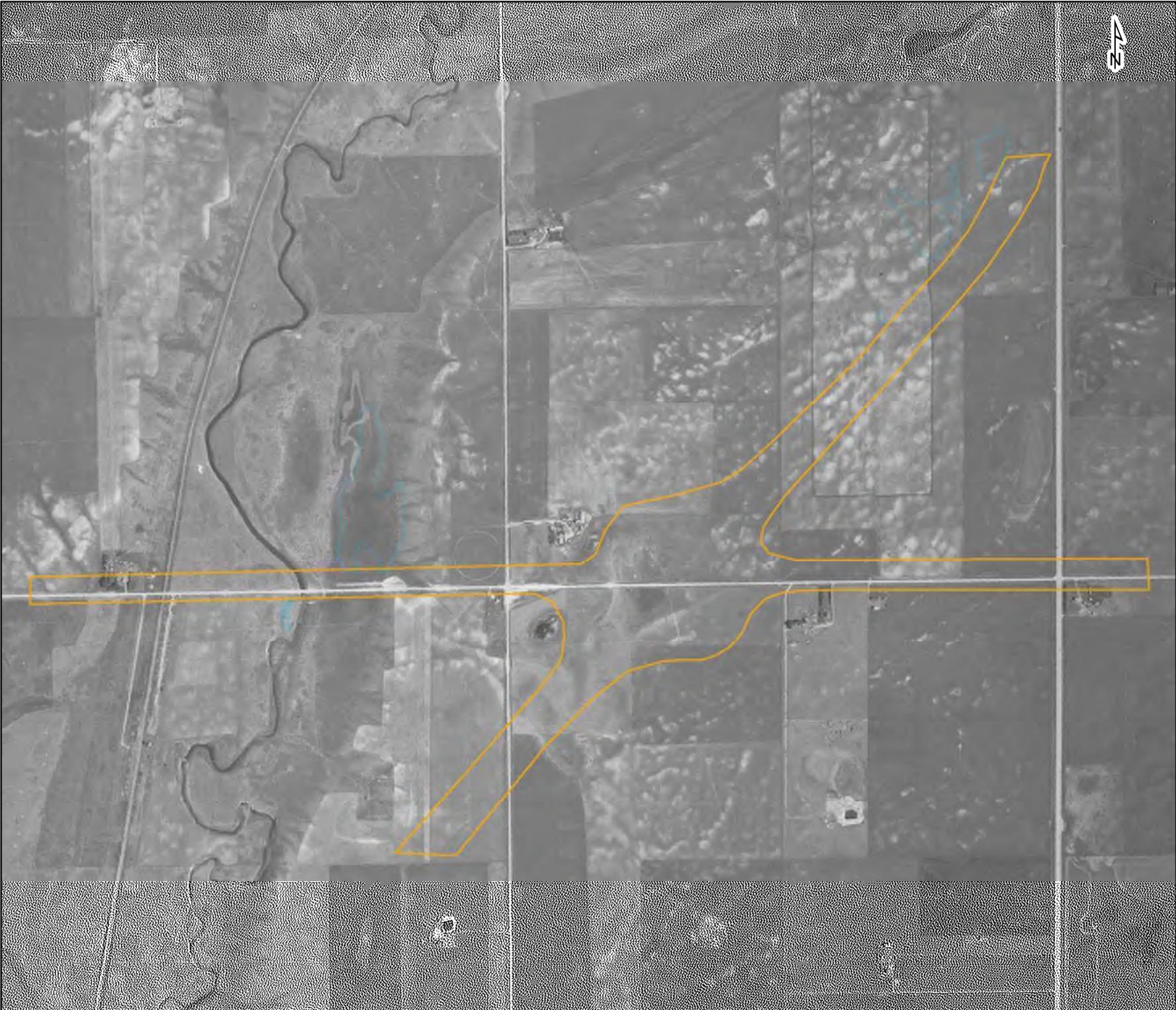
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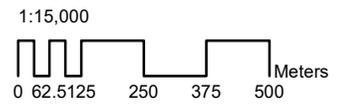
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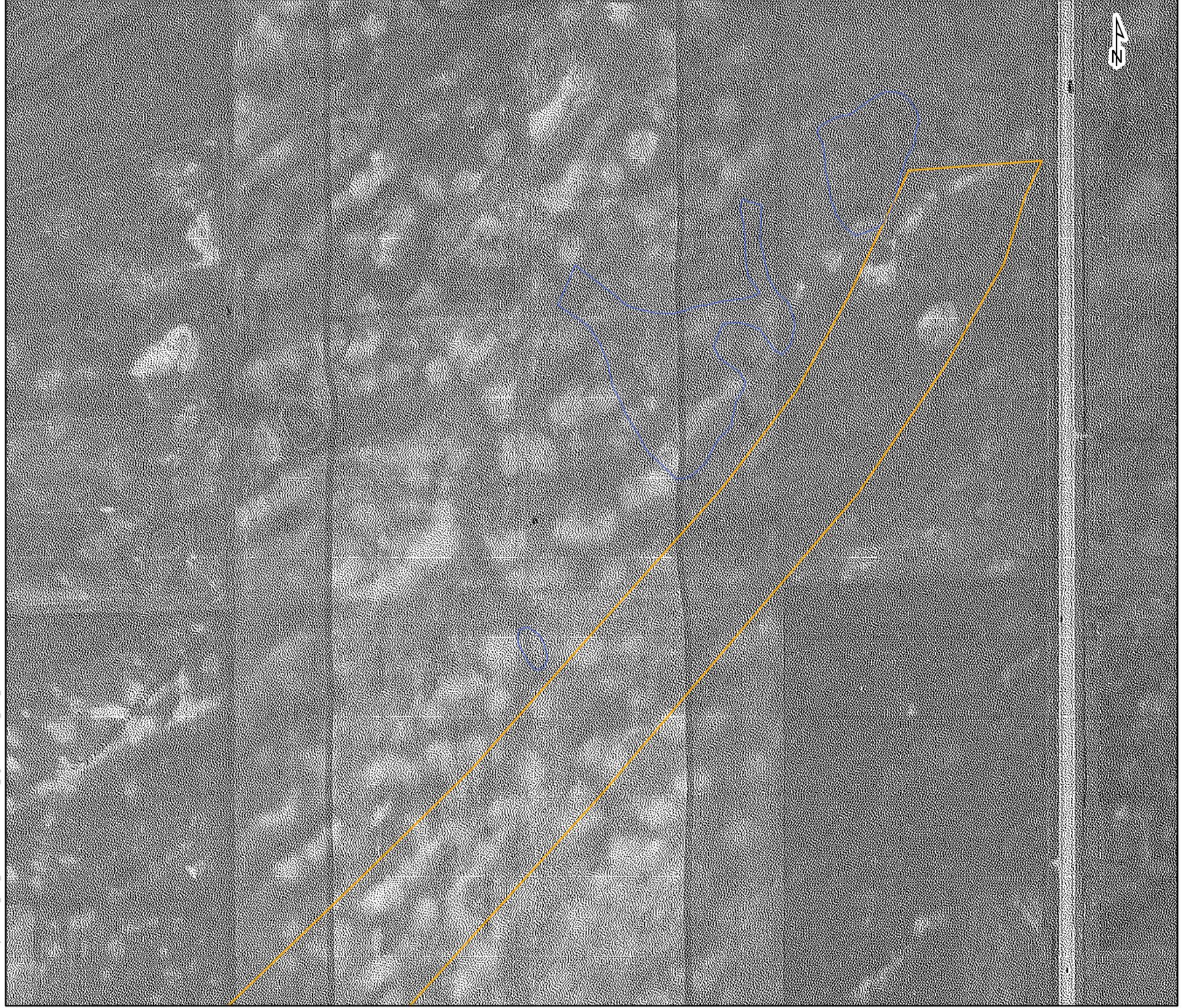
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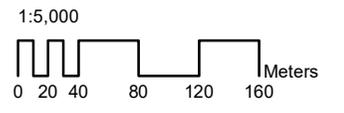
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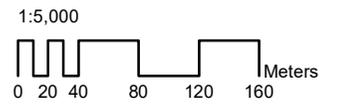
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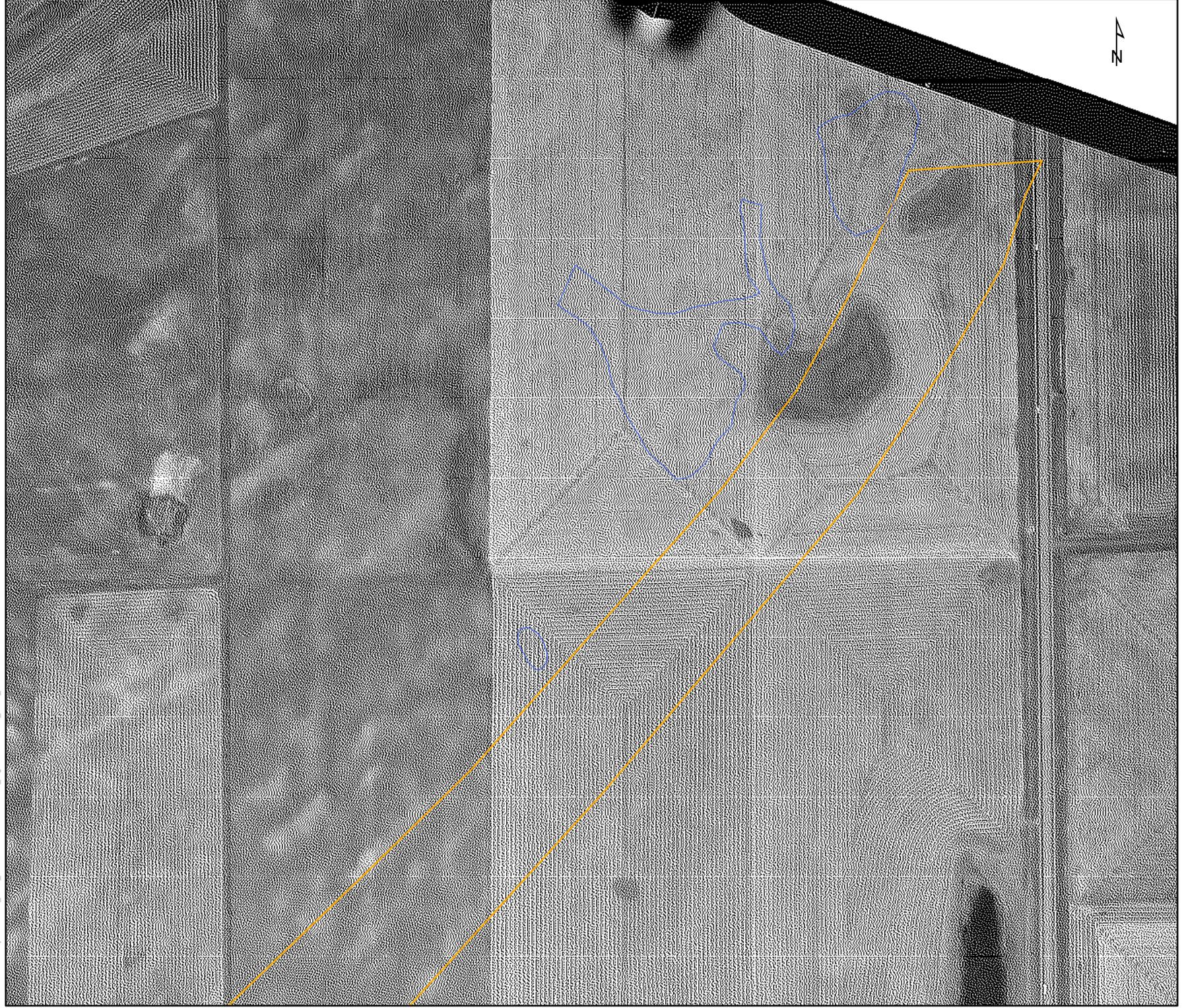
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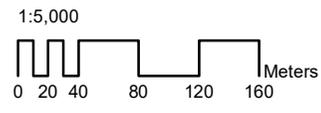
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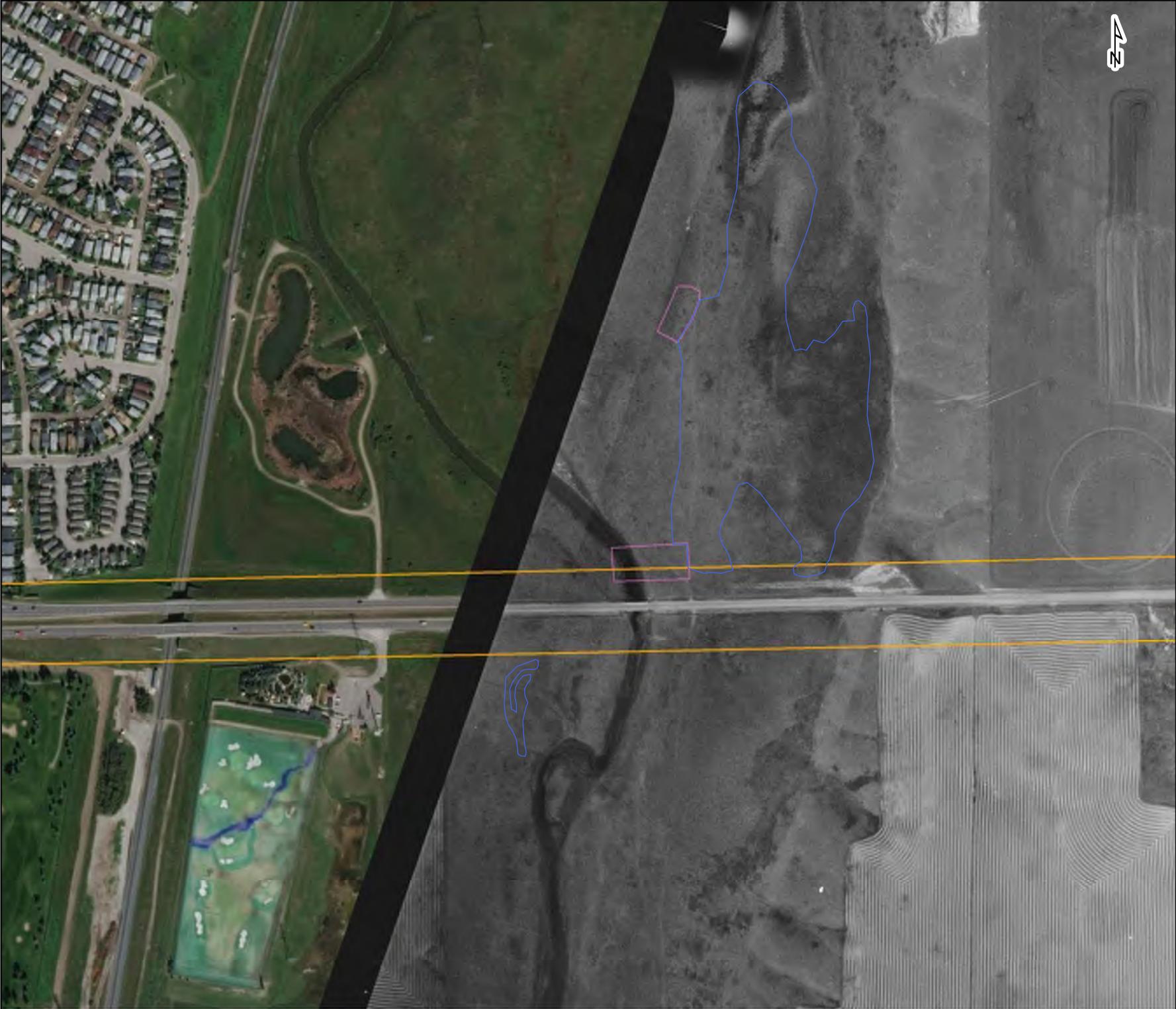
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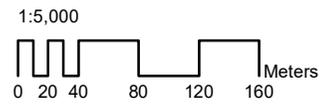


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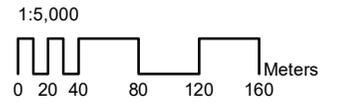


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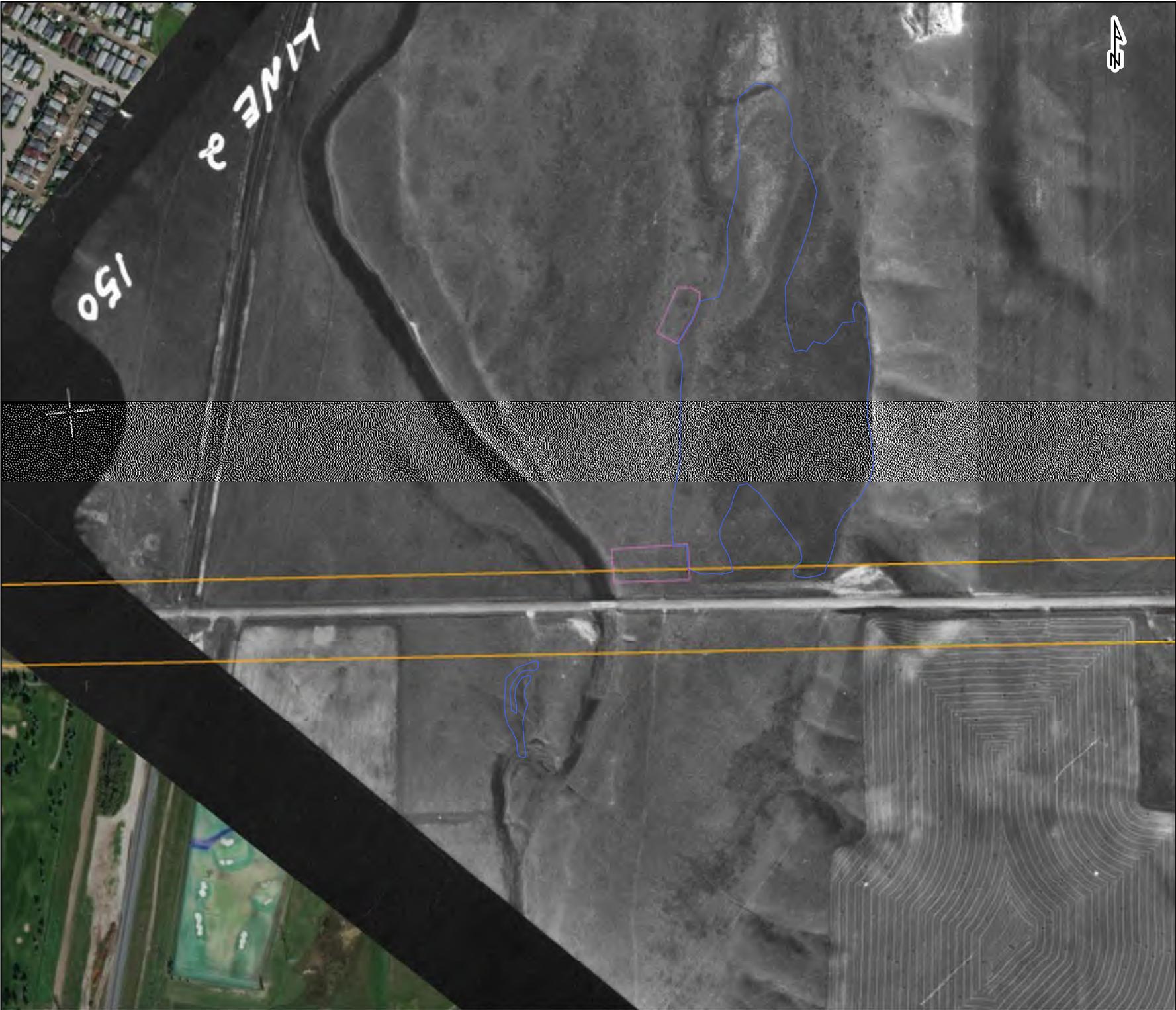
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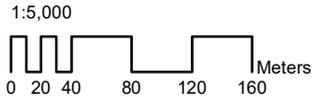
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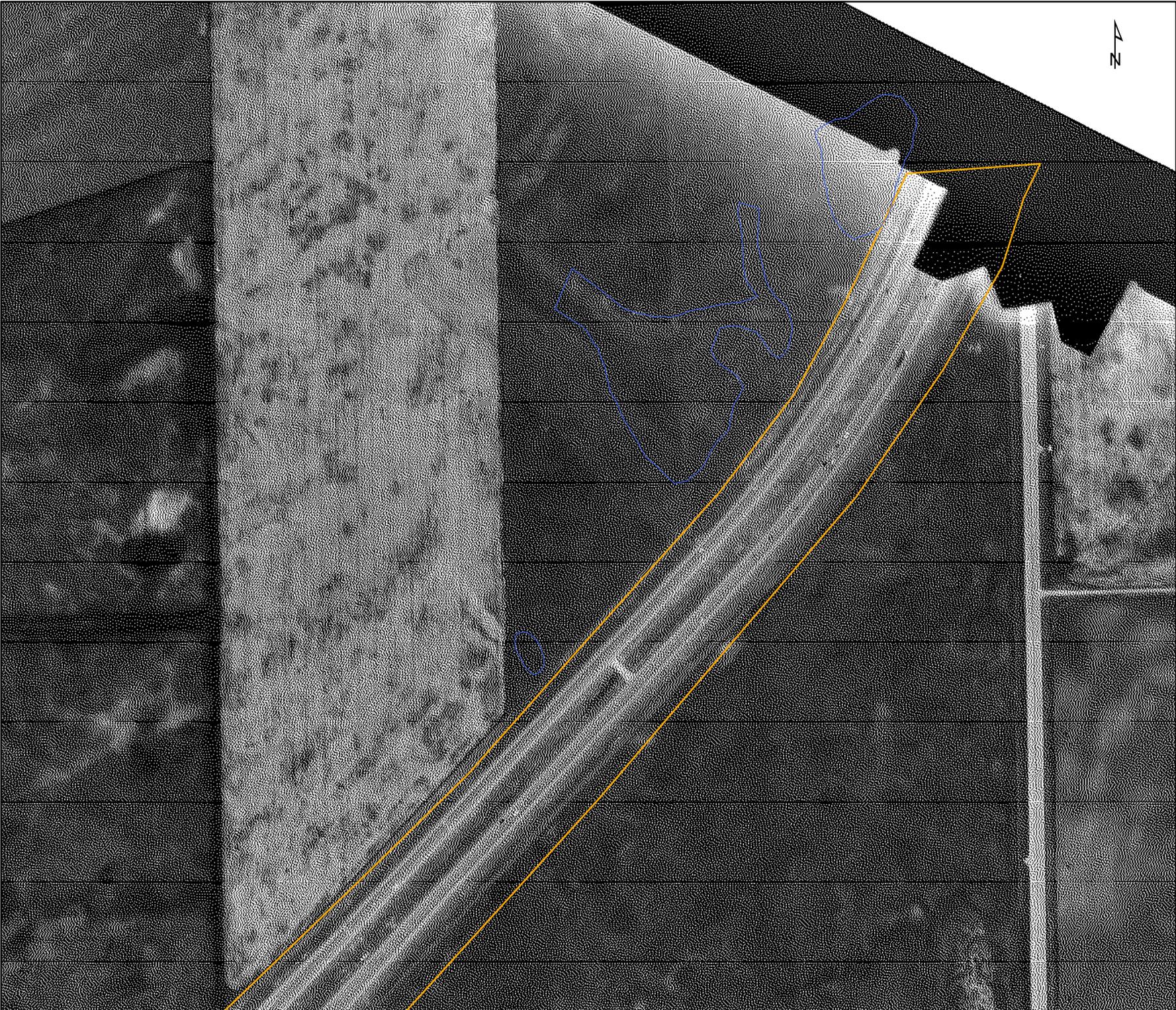
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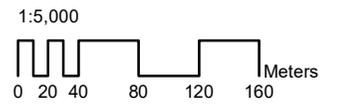
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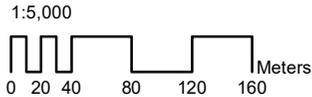
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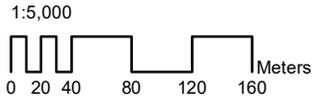
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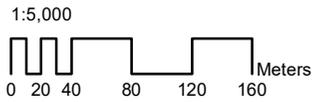


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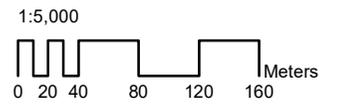


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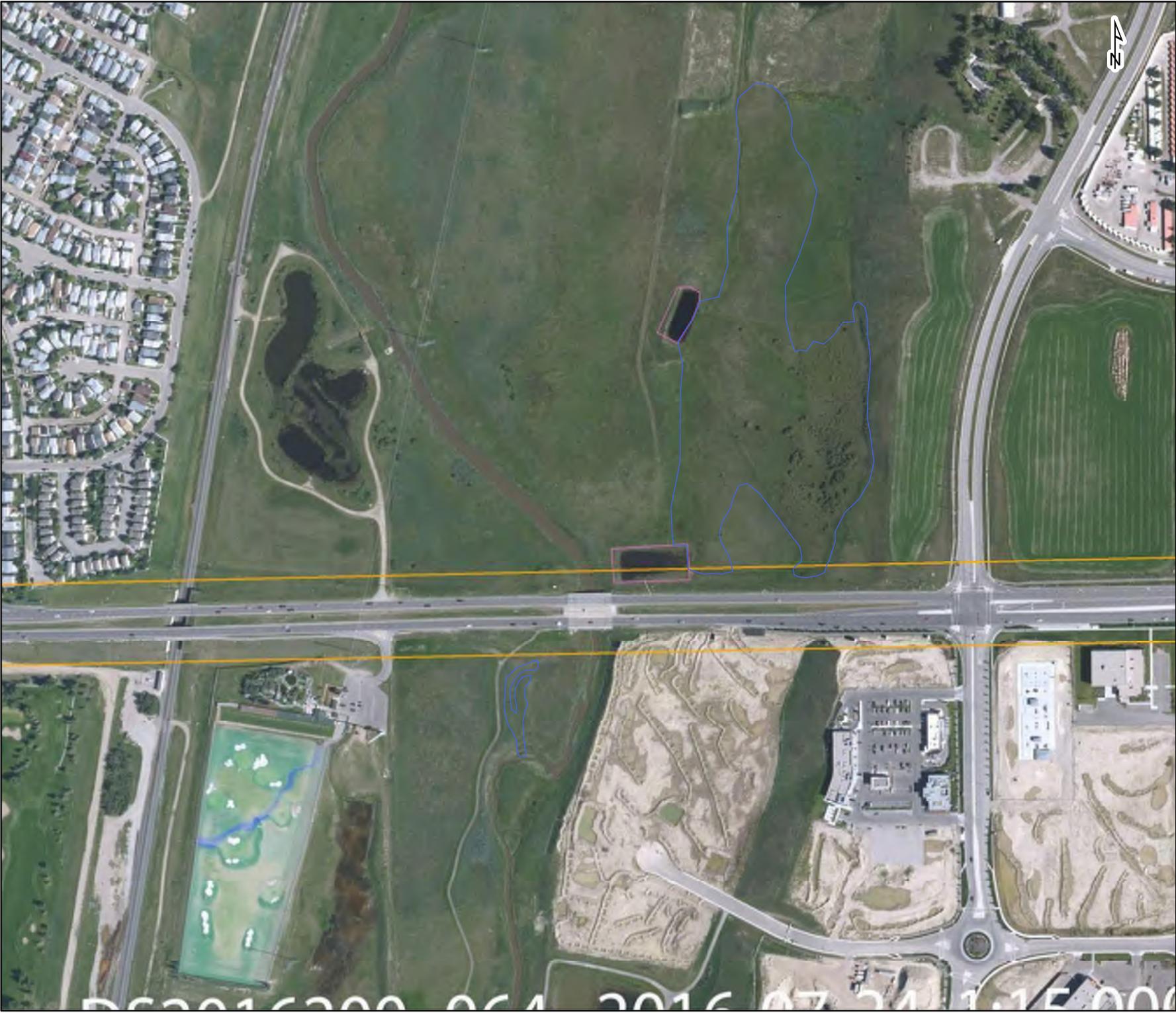


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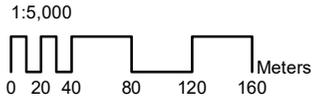


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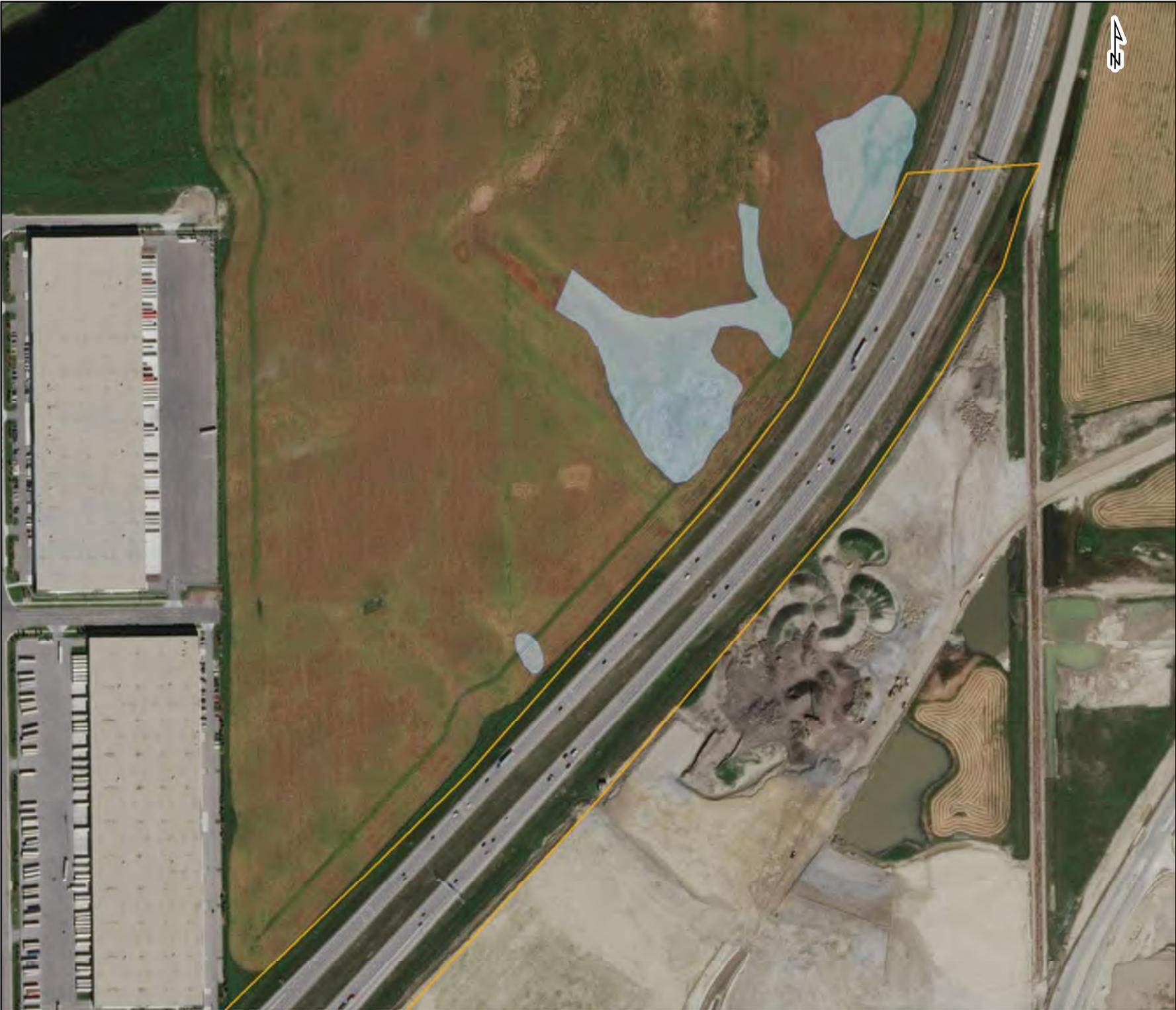
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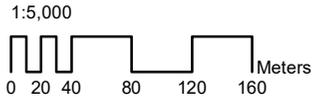


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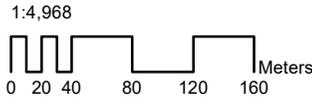
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APPENDIX
Site Photos

F



Plate 1 View north on Deerfoot Trail (NE 23-25-01 W5M; approximately 11U 707995/ 5670555N) (August 15, 2019).



Plate 2 View north on Deerfoot Trail (SE 25-25-01 W5M; approximately 11U 709177E/ 5671804N) (August 15, 2019).



Plate 3 View north on Deerfoot Trail (SW 25-25-01 W5M; approximately 11U 708540E/ 5671216N) (August 15, 2019).



Plate 4 View south on Deerfoot Trail (SE 25-25-01 W5M; approximately 11U 709374E/ 5672210N) (August 15, 2019).



Plate 5 View south on Deerfoot Trail (NW 23-25-01 W5M; approximately 11U 709450E/ 5672206N) (August 15, 2019).



Plate 6 View of agricultural field north on Country Hills Boulevard (NW 24-25-01 W5M; approximately 11U 708823E/ 5671090N) (August 15, 2019).



Plate 7 View of unmanaged roadside habitat with perennial sow-thistle; on the north side of Country Hills Boulevard, east of Deerfoot Trail (SE 25-25-01 W5M; approximately 11U 709373E/ 5671286N) (August 15, 2019).



Plate 8 View north on Country Hills Boulevard (SE 26-25-01 W5M; approximately 11U 707786E/ 5671208N) (August 15, 2019).



Plate 9 View from the west side of Country Hills Boulevard looking north (SW 26-25-01 W5M; approximately 11U 707018E/ 5671159N) (August 15, 2019).



Plate 10 View north of Nose Creek, Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 11 Willow sp. bank stabilization, Nose Creek, Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 12 Riprap bank stabilization, Nose Creek, Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 13 Potential wildlife corridor. Nose Creek, Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 14 Northern crayfish (*Orconectes virilis*), Nose Creek, Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 15 Animal tracks under the Nose Creek Bridge; near Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 16 View south on Nose Creek, Outfall #42 (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 17 View of wetland south of Country Hills Boulevard. Dominant species wire rush, foxtail barley and perennial sow-thistle (NE 23-25-01 W5M; approximately 11U 707365 E/ 5671079 N) (August 15, 2019).



Plate 18 View of gleyed sandy soil of south wetland. (NE 23-25-01 W5M; approximately 11U 707365 E/ 5671079 N) (August 15, 2019).



Plate 19 View of south wetland (NE 23-25-01 W5M; approximately 11U 707365 E/ 5671079 N) (August 15, 2019).



Plate 20 View of common toadflax (NE 23-25-01 W5M; approximately 11U 707365 E/ 5671079 N) (August 15, 2019).



Plate 21 View of scentless chamomile (SE 26-25-01 W5M; approximately 11U 707428E/ 5671175N) (August 15, 2019).



Plate 22 View of nodding thistle (NE 23-25-01 W5M; approximately 11U 707407 E/ 5671124 N) (August 15, 2019).



Plate 23 View of north wetland on north side of Country Hills Boulevard (SE 26-25-01 W5M; approximately 11U 707663 E/ 5671214 N) (August 15, 2019).



Plate 24 View of wetland soil on north side of Country Hills Boulevard (SE 26-25-01 W5M; approximately 11U 707572 E/ 5671210 N) (August 15, 2019).



Plate 25 View of dugout (SE 26-25-01 W5M; approximately 11U 707471 E/ 5671203 N) (August 15, 2019).



Plate 26 View of soil wetland on north side of Country Hills Boulevard nearby the dugout (SE 26-25-01 W5M; approximately 11U 707663 E/ 5671214 N) (August 15, 2019).



RELATED REPORT
Historical Resources Statements of
Justification

3



Calgary Head Office
 60, 4807 32 St. SE
 Calgary, AB T2B 2X3
 TEL: 403 984 8189
 info@circleconsulting.ca
 www.circleconsulting.ca

Edmonton Office
 210, 10544 106 St. NW
 Edmonton, AB T5H 2X6
 TEL: 780 423 5840
 info@circleconsulting.ca
 www.circleconsulting.ca

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 24, 605 Carson Drive
 Williams Lake, BC V2O 1T1
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Historic Resources Statements of Justification

City of Calgary

Country Hills Blvd FPS

This document contains sensitive information about Historic Resources that are protected under the provisions of the Alberta *Historical Resources Act*. This information is to be used to assist in planning the proposed project only. It is not to be disseminated, and no copies of this document are to be made without written permission of the Historic Resources Management Branch, Alberta Culture, Multiculturalism and Status of Women.

PART I

(1) Purpose:

The purpose of this Statement of Justification is to obtain *Historical Resources Act (HRA)* Approval for the Country Hills Blvd FPS (the Project) on behalf of the City of Calgary.

This document seeks to provide the relevant information to support HRA Approval. The City of Calgary is requesting approval of the development footprint as per Section 5 and Section 6 of this document, as well as the attached maps, shapefiles, and drawings.

(2) Project Name/Identifier:

Country Hills Blvd FPS

(3) Disposition Type & Number:

n/a

(4) Developer/Proponent:

Contact Name: Heather Leonhardt

Company Name: City of Calgary

Phone number: 403.268.1615

E-mail address: heather.leonhardt@calgary.ca

(5) Project Type and Description:

The City of Calgary requires a functional planning study (FPS) along Country Hills Boulevard to mitigate the existing traffic congestion and planned growth along this transportation route. The Project will investigate associated bridge upgrades required to widen the corridor to six lanes across Deerfoot Trail, Nose Creek, and the Canadian Pacific Rail tracks.



(6) Project Size (ha):

The FPS covers an area totalling 92.8 ha in size.

(7) Anticipated Ground Disturbance

The City of Calgary proposes to widen the corridor along Country Hills Boulevard and Deerfoot Trail. While specific disturbance is unknown, the anticipated impact to the area will involve potential bridge widening and storm water pond locations, as well as terraforming of the area, typical of infrastructure projects of this scale.

(8) Existing Disturbance:

The majority of the development traverses through lands that have been previously disturbed by existing roads and city developments.

(9) Landscape and Environmental Information:

The Project is located in the Foothills Fescue natural subregion within the Grasslands region of southern Alberta. Assessment of NTS maps and ESRI World Imagery show that the proposed development is characterized by generally flat to gently undulating terrain, with occasional slopes where the footprint crosses Nose Creek in the western portion of the project area.

(10) Attached Illustrative Materials and Digital Data:

1. NTS 1:50,000 Maps
2. Orthophoto Map
3. GIS shapefiles
4. Survey Plans
5. Palaeontology Maps
 - a. Surficial Geology
 - b. Bedrock Geology
 - c. Historic Resource Value Listing



PART II

(11) Historic Resource Types:		
Archaeology: <input checked="" type="checkbox"/>		Palaeontology: <input checked="" type="checkbox"/>
Historic Structures: <input type="checkbox"/>		Aboriginal Traditional Use: <input type="checkbox"/>
(12) Archaeological Resources:		
Site Borden #	HRV	Relationship to Activity and Anticipated Impacts
EgPm-12	4	The site boundary is mapped within the development footprint. The site may be impacted by the proposed ground disturbance activities.
EgPm-13	0	The site boundary is mapped approximately 460 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-28	0	The site boundary is mapped approximately 100 m south of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-32	0	The site boundary is mapped approximately 20 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-201	0	The site boundary is mapped approximately 45 m south of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-215	0	The site boundary is mapped approximately 270 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-216	0	The site boundary is mapped approximately 210 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-217	0	The site boundary is mapped within the development footprint. The site may be impacted by the proposed ground disturbance activities.
EgPm-218	0	The site boundary is mapped approximately 245 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.



Site Borden #	HRV	Relationship to Activity and Anticipated Impacts
EgPm-219	4	The site boundary is mapped within the development footprint. The site may be impacted by the proposed ground disturbance activities.
EgPm-220	4	The site boundary is mapped approximately 130 m south of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-221	0	The site boundary is mapped within the development footprint. The site may be impacted by the proposed ground disturbance activities.
EgPm-222	0	The site boundary is mapped approximately 300 m south of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-223	0	The site boundary is mapped approximately 310 m west of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-224	0	The site boundary is mapped approximately 330 m west of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-225	0	The site boundary is mapped approximately 215 m west of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-226	0	The site boundary is mapped approximately 160 m west of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-227	0	The site boundary is mapped approximately 135 m south of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-228	0	The site boundary is mapped within the development footprint. The site may be impacted by the proposed ground disturbance activities.
EgPm-231	0	The site boundary is mapped approximately 460 m northwest of the development footprint. The site will not be impacted by the proposed ground disturbance activities.



Site Borden #	HRV	Relationship to Activity and Anticipated Impacts
EgPm-232	0	The site boundary is mapped approximately 140 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-233	0	The site boundary is mapped approximately 40 m north of the development footprint. The site will not be impacted by the proposed ground disturbance activities.
EgPm-298	4	The site boundary is mapped within the development footprint. The site may be impacted by the proposed ground disturbance activities.
Permit Number(s)	Relationship to Project or Activity	
80-125	This was an HRIA conducted for the Coventry Hills North Calgary subdivision. The footprint overlaps with the proposed footprint in NW-23-025-01-W5M and SW-26-025-01-W5M. EgPm-201 was identified in the vicinity of the current development.	
81-016	This was an HRIA conducted for the Airdrie Water Supply Line. The footprint overlaps with the proposed footprint in SW-26-025-01-W5M. No new archaeological sites were identified in the vicinity of the current development.	
81-019	This was an HRIA conducted for the City of Calgary water supply line and sanitary forcemain. The footprint overlaps with the proposed footprint in NW-23-025-01-W5M. No new archaeological sites were identified in the vicinity of the current development.	
81-171	This was an HRIA conducted for the Calgary subdivision NE-23-25-1-W5. The footprint overlaps with the proposed footprint in NE-23-025-01-W5M. EgPm-219 to 228 were identified in the vicinity of the current development.	
81-173	This was an HRIA conducted for the Calgary Agra Park. The footprint overlaps with the proposed footprint in SW-25-025-01-W5M. EgPm-215 to 218 were identified in the vicinity of the current development.	
81-174	This was an HRIA conducted for the Nose Creek Bar O.W. Ranches. The footprint overlaps with the proposed footprint in SE-26-025-01-W5M. EgPm-232 and EgPm-233 were identified in the vicinity of the current development.	



Permit Number(s)	Relationship to Project or Activity
81-175	This was an HRIA conducted for the Nose Creek Optimax subdivision. The footprint overlaps with the proposed footprint in SE-25-025-01-W5M. No new archaeological sites were identified in the vicinity of the current development.
01-017	This was an HRIA conducted for the Balzac power plant sewer line Country Hills Boulevard to 144 Ave NE. The footprint overlaps with the proposed footprint in SW-26-025-01-W5M. EgPm-32 were identified in the vicinity of the current development.
04-404	This was an HRIA conducted for the Balzac power plant sewer line Country Hills Boulevard to 144 Ave NE. The footprint overlaps with the proposed footprint in NW-23-025-01-W5M and SW-26-025-01-W5M. No new archaeological sites were identified in the vicinity of the current development.
04-412	This was an HRIA conducted for the North East Regional policy planning area. The footprint overlaps with the proposed footprint in SW-28-025-29-W4M and NW-21-025-29-W4M. No new archaeological sites were identified in the vicinity of the current development.
06-349	This was an HRIA conducted for the Stoney industrial lands in NE Calgary. The footprint overlaps with the proposed footprint in SW-25-025-01-W5M. No new archaeological sites were identified in the vicinity of the current development.
13-035	This was an HRIA conducted for the TAQA North Ltd. temporary access and dig site. The footprint overlaps with the proposed footprint in multiple quarter sections. No new archaeological sites were identified in the vicinity of the current development.
Proximity to HRV 1 and/or HRV 2 Sites:	
The project footprint does not cross, nor is it adjacent to any HRV 1 or HRV 2 lands or site areas.	



Evaluation:

The proposed City of Calgary Country Hills Blvd FPS traverses mainly flat to gently undulating terrain that has been subject to previous disturbance associated with construction of current infrastructure. In these areas, the project is deemed to have limited potential for the presence of buried, intact cultural materials. However, there are undisturbed areas associated with Nose Creek, including areas with previously recorded archaeology sites, that have potential for buried, intact cultural material.

Significant sites (HRV 4) EgPm-12 and EgPm-219 are within the current project footprint and may be subject to impact. The recorded extent of EgPm-298 is also within the boundaries of the proposed development; however, the site extent is arbitrary and occurs within an area highly disturbed by infrastructure and commercial development. Additional sites of limited significance (HRV 0) are also within proposed boundaries; these include EgPm-217, EgPm-221, and EgPm-228. These sites are of limited concern, given previous disturbance, though their presence is indicative of the potential in the area to identify further unrecorded sites where investigation has yet to occur. The significant sites, however, should be revisited to assess the potential impact by the proposed development.

Recommendations:

Given the above evaluation, ***Historical Resources Act Approval with Conditions is recommended for the City of Calgary Country Hills Blvd FPS as per the attached drawings and shapefiles, with the Condition being that a Historical Resources Impact Assessment (HRIA) be conducted in any undisturbed areas associated with Nose Creek. In particular, the HRIA should address the relationship between the development and previously recorded sites EgPm-12 and EgPm-219.***

Recommendations made by:

Name: Margarita de Guzman, M.A., RFP

Company: Circle CRM Group Inc.

Phone number: 403-984-8189

Fax number: 780-423-5878

E-mail address: marg@circleconsulting.ca

Date (mm-dd-yyyy): 09-26-2019

Recommendations endorsed by: as above



(13) Palaeontological Resources:		
Locality Name	HRV	Relationship to Activity and Anticipated Impacts
Who Nose ?	3	Key Paleocene Fossil Site, includes important small mammal fauna. Located approx. 3.0 km to the SW. No impact from anticipated activity.
Zagas	3	Key Paleocene Fossil Site, includes important small mammal fauna. Located approx. 3.5 km to the NW. No impact from anticipated activity.
Livingston B2 to B2a Paleocene Shell Bed	3	Invertebrates, vertebrates? Located approx. 3.6 km to the N. No impact from anticipated activity.
Coventry Hills Stormwater Wet Pond	4	Canine tooth, invertebrates, plants. Located approx. 100-200 m north of Project boundary along Country Hills Boulevard. Impact from anticipated activity is unlikely.
Calgary Site	4	Fossil content not known. Located approx. 2.6 km to the WSW. No impact from anticipated activity.
“Brookfield” Paleocene Shellbeds	4	Several invertebrate sites located approx. 2-3 km to the N. No impact from anticipated activity.
Permit Number(s)		Relationship to Project or Activity
Not known, but likely several due to the presence of existing fossil sites and several recent construction projects such as commercial and residential subdivisions and roadways.		It is likely that previous paleontological investigations occurred prior to the construction of The QE Highway/Country Hills Blvd. Interchange and connecting roadways.
Proximity to HRV 1 and/or HRV 2 Sites:		
The project footprint does not cross, nor is it adjacent to any HRV 1 or HRV 2 lands or site areas		



Evaluation:

Surficial deposits originally consisted of Quaternary lacustrine and fluted moraine sediments. It is almost certain that this material was removed during construction of the QE 2 and Country Hills Blvd. roadways and corresponding intersection (overpass). Bedrock consists of the continental rocks of the Paleocene Paskapoo and Porcupine Hills formations. Several Paleocene fossil sites are nearby and are listed in Section 13 and several adjacent sections of land are notated with Historical Resource Values of p (paleontology). It is likely that there is no exposed in situ Paleocene bedrock within the Project footprint due to the previous construction of the roadways and overpass, therefore a pre-construction paleontological Historical Resources Impact Assessment is not practical in this case.

Recommendations:

As there are several proximal key Paleocene fossil sites adjacent to the Project area, the City of Calgary should share with a professional paleontologist, the Project's final construction plans to determine if in situ, potentially fossiliferous Paleocene bedrock will be disturbed during excavation. If so, then **a paleontological construction monitoring program is recommended in those areas where bedrock is likely to be disturbed. If it can be demonstrated that no in situ bedrock will be disturbed, then HRA Section 31 clearance is recommended.**

Recommendations made by:

Name: Sam Wilson

Company: Nautilus Paleontology, Inc.

Phone number: 403.232.6458

Fax number: n/a

E-mail address: nautilus1@shaw.ca

Date: 09-03-2019

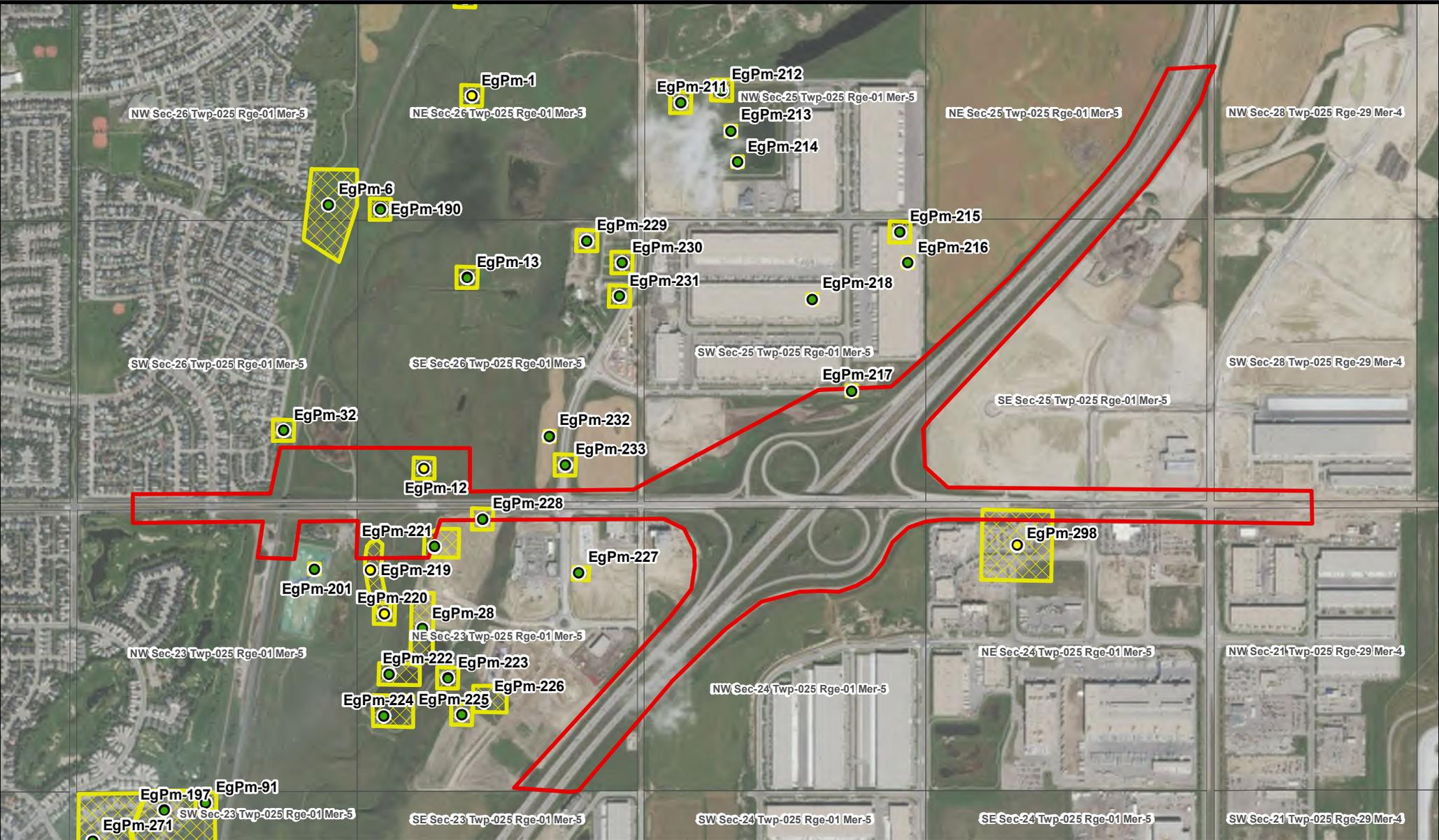
Recommendations endorsed by: as above



(14) Historic Structures:	
HS Number	Relationship to Activity and Anticipated Impacts
n/a	n/a
Other Historic Structures	Relationship to Activity and Anticipated Impacts
n/a	n/a
Proximity to HRV 1 and/or HRV 2 Sites:	
The project footprint does not cross, nor is it adjacent to any HRV 1 or HRV 2 lands or site areas.	
Evaluation:	
n/a	
Recommendations:	
n/a	
Information Provided By:	
Name: Company: Phone number: Fax number: E-mail address: Date (mm-dd-yyyy):	



(15) Aboriginal Traditional Use Sites:	
Potentially Impacted Sites	Relationship to Activity and Anticipated Impacts
n/a	n/a
Evaluation:	
n/a	
Recommendations:	
n/a	
Information Provided By:	
Name: Company: Phone number: Fax number: E-mail address: Date (mm-dd-yyyy):	

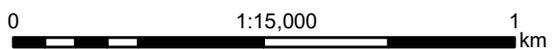


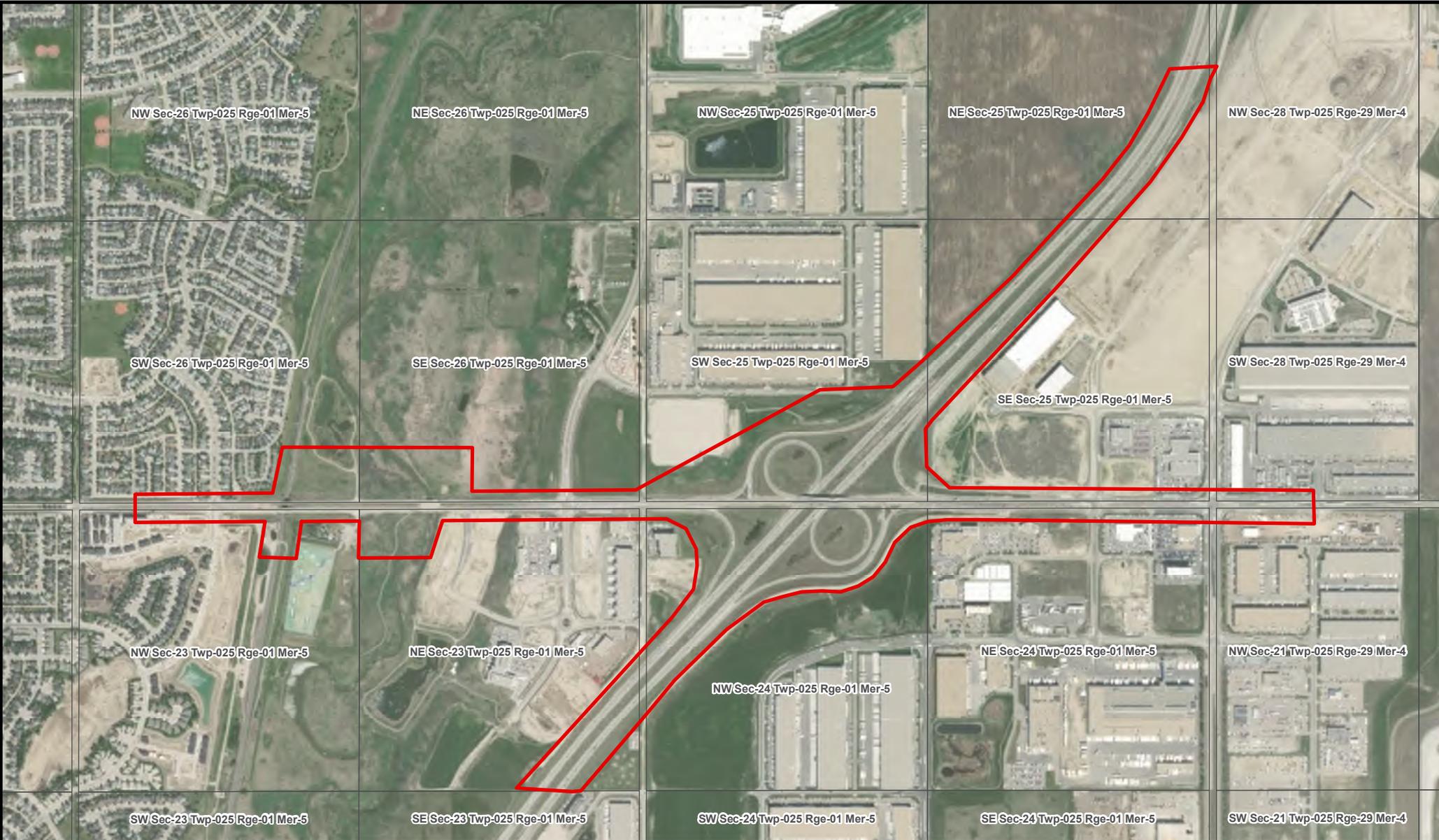
**City of Calgary
Country Hills Blvd FPS**

NTS 1:50,000 82O 01 & 82P 04
NAD83 3TM Zone 114
Basemap: ESRI World Imagery



- Development Footprint
- Extent of Known Historic Resource
- Known Historic Resource, HRV 4
- Known Historic Resource, HRV 0





City of Calgary
Country Hills Blvd FPS

 Development Footprint

NTS 1:50,000 82O 01 & 82P 04
 NAD83 3TM Zone 114
 Basemap: ESRI World Imagery



Historical Resources Act Approval with Conditions

Proponent: City of Calgary
P.O. Box 2100, Station M, #8124, Calgary, AB T2P 2M5

Contact: Heather Leonhardt

Agent: Circle CRM Group Inc.

Contact: Margarita de Guzman

Project Name: Country Hills Boulevard FPS Widening Project

Project Components: Urban Road

Application Purpose: Requesting HRA Approval / Requirements

Historical Resources Act approval is granted for the activities described in this application and its attached plan(s)/sketch(es) subject to the following conditions.



David Link
Assistant Deputy Minister
Heritage Division
Alberta Culture, Multiculturalism
and Status of Women

SCHEDULE OF CONDITIONS

ARCHAEOLOGICAL RESOURCES

Conditional *Historical Resources Act* approval is granted relative to archaeological resources on the understanding that a targeted Historic Resources Impact Assessment for archaeological resources will be conducted, as outlined below.

1. The Historic Resources Impact Assessment must include the target areas within the project that are identified in the attached Statement of Justification. This includes high potential areas in Sections 23 and 26, Twp 25, Rge 1, W5M adjacent to Nose Creek.

Development activities outside the specified target areas may proceed as planned.

2. The Historic Resources Impact Assessment must be carried out prior to the initiation of any land surface disturbance activities under snow-free, unfrozen ground conditions. Should the project require field studies under winter conditions, directions in the [Archaeological Survey Information Bulletin: Winter Conditions](#) must be followed.

SCHEDULE OF CONDITIONS (continued)

3. During the Historic Resources Impact Assessment, the proponent's consulting archaeologist must confirm the relationship between the project's proposed development footprint and previously recorded archaeological sites EgPm-12 and EgPm-219.
4. The Historic Resources Impact Assessment for archaeological resources must be conducted on behalf of the proponent by an archaeologist qualified to hold an archaeological research permit within the Province of Alberta. A permit must be issued by Alberta Culture, Multiculturalism and Status of Women prior to the initiation of any archaeological field investigations. Please allow ten working days for the permit application to be processed.
5. Results of the Historic Resources Impact Assessment must be reported to Alberta Culture, Multiculturalism and Status of Women and subsequent *Historical Resources Act* approval must be granted before development proceeds in Sections 23 and 26, Twp 25, Rge 1, W5M.
6. Site-specific conditions and approvals are itemized below.

SITE	HRV	SITE DESCRIPTION	CONDITIONS/APPROVAL
EgPm-12	4	stone feature	The proponent's consulting archaeologist must evaluate the relationship between this site and the project's proposed development footprint.
EgPm-217	0	isolated find	There are no further <i>Historical Resources Act</i> requirements for this site relative to current and future projects. Development may proceed in the area of this site.
EgPm-219	4	stone feature	The proponent's consulting archaeologist must evaluate the relationship between this site and the project's proposed development footprint.
EgPm-221	0	stone feature	There are no further <i>Historical Resources Act</i> requirements for this site relative to current and future projects. Development may proceed in the area of this site.
EgPm-228	0	stone feature	There are no further <i>Historical Resources Act</i> requirements for this site relative to current and future projects. Development may proceed in the area of this site.
EgPm-298	4	campsite	There are no further <i>Historical Resources Act</i> requirements for this site relative to the current project. If additional development occurs in the area, further assessment may be required.

PALAEONTOLOGICAL RESOURCES

Conditional *Historical Resources Act* approval is granted on the understanding that a Historic Resources Impact Assessment for palaeontological resources in the form of a monitoring program will be conducted, as outlined below.

1. A monitoring program is required for excavation activities that will impact the Nose Creek valley, including the break-of-slope, the valley slopes and floodplain.

SCHEDULE OF CONDITIONS (continued)

2. No excavation activities are to take place along the Nose Creek valley, as described above, until a professional consulting palaeontologist is on-site to monitor construction activities. Should significant palaeontological resources be encountered during the conduct of the monitoring program, the Royal Tyrrell Museum of Palaeontology must be contacted. It may then be necessary for Alberta Culture, Multiculturalism and Status of Women to issue further instructions regarding these resources.
3. The monitoring program is to be conducted on behalf of the proponent by a palaeontologist qualified to hold a palaeontological research permit within the Province of Alberta. A permit must be issued by Alberta Culture, Multiculturalism and Status of Women prior to the initiation of any palaeontological field investigations. Please allow ten working days for the permit application to be processed.

ABORIGINAL TRADITIONAL USE SITES

There are no *Historical Resources Act* requirements associated with Aboriginal traditional use sites of a historic resource nature; however, the proponent must comply with [Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources](#), which are applicable to all land surface disturbance activities in the Province.

HISTORIC STRUCTURES

There are no *Historical Resources Act* requirements associated with historic structures; however, the proponent must comply with [Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources](#), which are applicable to all land surface disturbance activities in the Province.

PROVINCIALY DESIGNATED HISTORIC RESOURCES

There are no *Historical Resources Act* requirements associated with Provincially Designated Historic Resources; however, the proponent must comply with [Standard Requirements under the Historical Resources Act: Reporting the Discovery of Historic Resources](#), which are applicable to all land surface disturbance activities in the Province.

ADDITIONAL COMMENTS

1. To obtain contact information for consultants qualified to undertake the assessment work specified above, please consult the list of [Alberta Historic Resource Consultants](#).
2. In addition to any specific conditions detailed above, the proponent must abide by all [Standard Conditions under the Historical Resources Act](#).

Lands Affected: All New Lands

Proposed Development Area:

MER	RGE	TWP	SEC	LSD List
5	1	25	24	12-16
5	1	25	23	8-9,13-16

SCHEDULE OF CONDITIONS (continued)

5	1	25	25	1-4,6-10,16
5	1	25	26	1-4
4	29	25	28	3-4,12-13
4	29	25	21	13-14

Documents Attached:

Document Name	Document Type
Orthophoto Map	Illustrative Material
Orthophoto Map without site information	Illustrative Material
SoJ	Justification for Archaeology



RELATED REPORT
Hydrotechnical Assessment Report by
AECOM

4

Memorandum

To	Jeffrey Xu, M.Sc., P.Eng., City of Calgary	Page	1
CC	Glen Holland		
Subject	Country Hills Boulevard at Nose Creek – Hydrotechnical Analysis		
From	Tyson Ehnes, P.Eng., PMP		
Date	June 9, 2021	Project Number	60605038

This memorandum discusses the hydrotechnical analysis of the Country Hills Boulevard crossing of Nose Creek. ISL Engineering has been contracted by the City of Calgary (City) to provide the feasibility design modifications to Country Hills Boulevard. AECOM is providing hydrotechnical analysis of this crossing as part of our contract with the City to provide a feasibility design for the 128 Avenue expansion and crossing of Nose Creek approximately 2 km upstream of Country Hills Boulevard.

1. Hydrology

The existing Government of Alberta HEC-RAS model of Nose Creek was used to assess the crossing. The model extends from just south of Airdrie, AB to the confluence of Nose Creek with the Bow River. This model produced the existing Flood Hazard Mapping for Nose Creek published by the Government of Alberta.

The HEC-RAS model contains design flows for various return periods. The design flows relevant to Country Hills Boulevard are shown in **Table 1**. The design flows provided within the model were cross referenced with the Alberta Environment and Parks hydrologic analysis in *Bow, Elbow, Highwood, and Sheep River Hydrology Assessment* (Golder Associates, September 2020).

Design flows at Country Hills Boulevard were not specifically provided in the 2020 AEP hydrology report. Design flows for Country Hills Boulevard were calculated using the provided design flows for Nose Creek at Calgary and transferred using the regional exponents for the Foothills Region provided in the 2020 AEP report. The watershed area of Nose Creek up to Country Hills Boulevard was estimated to be 525 km².

The updated 2020 design flows show a general increase in flow from the 2000 hydrology. In the case of the 10-year and 5-year flows the 2020 design flows show a decrease. A similar observation was made when comparing the published 2020 design flows for Nose Creek at Airdrie to the 2000 hydrology where the 10-year flow decreased from 15.5 m³/s to 12 m³/s and the 5-year flow decreased from 9.26 m³/s to 8.41 m³/s.

The process of calculating the design flows for Country Hills Boulevard is consistent with the methodology provided in the 2020 AEP hydrology report. The 2000 and updated 2020 design flows are presented in **Table 1**.

Table 1: Design Flows for Nose Creek at Country Hills Boulevard

Return Period	2000 Design Flow (m ³ /s)	2020 Design Flow (m ³ /s)
100-Year	60.30	72.31
50-Year	43.98	49.38
10-Year	17.94	16.10
5-Year	10.72	7.17
2-Year	4.03	4.79

*2000 based on Alberta Flood Hazard Mapping model

2. Hydraulic Analysis

ISL Engineering provided the proposed functional design for the Country Hills Boulevard bridge. The design involves widening of the existing bridge structure from approximately 36.25 m to 48.67 m. The proposed changes have no impact on the bridge height or hydraulic opening.

The proposed bridge was built into the HEC-RAS model and the hydraulic results were compared to the existing condition. The existing condition modelling was updated with the 2020 hydrology to enable a direct comparison with the proposed condition. Therefore, the existing condition water levels will differ from the published flood hazard mapping levels which utilize the 2000 hydrology. The model results are shown in **Table 2**.

Table 2: Hydraulic Model Results

Return Period	Discharge (m ³ /s)	Upstream Water Level (m)	Freeboard to Bottom Chord (m)	Velocity (m/s)
Existing Condition				
100-Year	72.31	1058.08	0.34	1.61
50-Year	49.38	1057.73	0.69	1.35
10-Year	16.10	1056.90	1.52	0.90
5-Year	7.17	1056.50	1.92	0.71
2-Year	4.79	1056.36	2.06	0.61
Proposed Condition				
100-Year	72.31	1058.11	0.31	1.61
50-Year	49.38	1057.75	0.67	1.35
10-Year	16.10	1056.91	1.51	0.90
5-Year	7.17	1056.51	1.91	0.71
2-Year	4.79	1056.37	2.05	0.61

The hydraulic modelling results show that the proposed bridge widening has a minimal impact on the bridge hydraulics and Nose Creek water levels. A small increase (1-3 mm) in water level is observed which can be attributed to increased frictional energy loss from the proposed bridge. Velocity through the bridge was unchanged.



APEGA ID# 245396

Tyson Ehnes, P.Eng.
AECOM, Water Management