PHASE I ENVIRONMENTAL SITE ASSESSMENT

Lloydminster Northeast Area Structure Plan
Lloydminster, Saskatchewan

Prepared for:

City of Lloydminster

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EXECUTIVE SUMMARY

This report presents the findings of a Phase I Environmental Site Assessment (Phase I ESA) conducted the properties identified below and located in Lloydminster, Saskatchewan.

- NW ¼ 1-50-28 W3M (includes Lot 1, Block 1, Plan 90B11438)
- NW ¼ 11-50-28 W3M (includes Block A, Plan 71B02795 and Block A, Plan 102084409)
- Block Z, Plan 60B09193
- LSD 3, 4, 5 of 11-50-28 W3M
- LSD 6-11-50-28 W3M
- SE ¼ 11-50-28 W3M
- NW ¼ and SW ¼ 12-50-28 W3M

The Phase I ESA was completed by SolidEarth Geotechnical Inc. (SolidEarth) at the request of Mr. Anthony Andre with the City of Lloydminster (the City). Authorization to proceed with the work was received on 24 June 2020.

The methodology used by SolidEarth in conducting the Phase I ESA was based on the requirements of the Canadian Standards Association and included the following:

- review of publicly available historical records for the subject property and surrounding properties
- visual inspection of the subject property and perimeter viewing of neighbouring properties
- interview of personnel knowledgeable of the current and/or historical use of the subject property and surrounding properties
- preparation of this report summarizing the methodology and findings

Key Findings

The Phase I ESA identified the following key findings. The locations of areas of potential concern that were considered to pose a moderate to high risk of environmental impact to the Site are shown on Figure 9.

- There were two onsite spills in the northeast portion of the Site (NW ¼ 12-50-28 W3M) along with three offsite spills to the north and east of the Site. The spills were associated with nearby oil and gas infrastructure and the COL Landfill to the north and presented a high potential for environmental impact to the northeast portion of the Site.

- Remaining impacted areas within the COL Public Works Shop and Yard. The items of concern included:
    - PHC, chloride, and nitrate impacted zones in the yard and offsite to the east of the yard.
    - The presence of an in-floor hydraulic lift inside the building.
    - Floor drains/sumps inside the building.
- Potential for impacts to the western portion of the Site (LSD 4 and 5 of 11-50-28 W3M) due to the presence of upgradient industrial operations.
- Potential for PFAS impacts to the soil and groundwater in the fire fighting training area located in NW ¼ 11-50-28 W3M.

Recommendations

Information provided in the previous ESAs completed by EcoVision Consulting Group Inc. (EcoVision) identified remaining PHC, chloride, and nitrate impacts in the COL Public Works Yard that have yet to be remediated. Items of concern were also identified inside the building including the in-floor hydraulic lift, contamination in the drains, and hazardous building materials.

Based on this information, the following recommendations are made with regard to the COL Public Works Shop and Yard:

- The remediation of the remaining impacted areas of the yard and implementation of the measures recommended by EcoVision.
- Appropriate safety procedures be implemented and followed prior to any renovation or demolition activities regarding the shop building, due to the confirmed presence of mould, mice infestation and droppings (potential viral hazard), PCB-containing ballasts, ODS, and mercury containing materials.
- A Phase II ESA is recommended to assess the potential for onsite impacts due to the presence of the in-floor hydraulic lift and contaminated drains. The Phase II ESA would consist of drilling boreholes inside the building in the vicinity of the hydraulic lift to assess the condition of nearby soil and groundwater.

A Phase II ESA is also recommended in order to confirm the presence/absence of PHC impacts in the northeast (NW ¼ 12-50-28 W3M) and western portions (LSD 4 and 5 of 11-50-28 W3M) of the Site, as well as investigate the potential PFAS impacts to the soil and groundwater in the fire fighting training grounds (NW ¼ 11-50-28 W3M). The Phase II ESA would consist of drilling boreholes along the perimeter of the northeast and western portions of the Site to assess the condition of the soil and groundwater.

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1.0 INTRODUCTION

This report presents the findings of a Phase I Environmental Site Assessment (Phase I ESA) conducted on the properties identified below, which are located in Lloydminster, Saskatchewan.

- NW ¼ 1-50-28 W3M (also includes Lot 1, Block 1, Plan 90B11438)
- NW ¼ 11-50-28 W3M (also includes Block A, Plan 71B02795 and Block A, Plan 102084409)
- Block Z, Plan 60B09193
- LSD 3, 4, 5 of 11-50-28 W3M (includes 5709 – 50 Avenue, Lloydminster, Saskatchewan)
- LSD 6-11-50-28 W3M
- SE ¼ 11-50-28 W3M
- NW ¼ and SW ¼12-50-28 W3M

The Phase I ESA was completed by SolidEarth Geotechnical Inc. (SolidEarth) at the request of Mr. Anthony Andre with the City of Lloydminster (COL). Authorization to proceed with the work was received on 24 June 2020.

2.0 PROJECT BACKGROUND AND ASSESSMENT OBJECTIVE

Based on the current project understanding, it was understood that the City wishes to create an area structure plan (ASP) for the referenced properties in the northeast portion of the City. The Phase I ESA was required for project due diligence purposes as part of the ASP process.

The objective of the Phase I ESA was to identify potential or actual environmental concerns from current or historical uses of the site and surrounding properties, document the current environmental site status, and to determine if additional environmental assessment is recommended.

3.0 ASSESSMENT METHODOLOGY

The methodology used by SolidEarth in conducting the Phase I ESA was based on the requirements of the Canadian Standards Association[1] and included the following:

- review of publicly available historical records for the subject property and surrounding properties

[1] Canadian Standards Association (CSA), November 2001 (reaffirmed 2016), *Phase 1 Environmental Site Assessment (CSA Z768-01)*, Ottawa, Canada.

- visual inspection of the subject property and perimeter viewing of neighbouring properties
- interview of personnel knowledgeable of the current and/or historical use of the subject property and surrounding properties
- preparation of this report summarizing the methodology and findings

4.0 OVERVIEW OF SITE AND SURROUNDING LAND

4.1 SITE LOCATION AND DESCRIPTION

The properties in the ASP evaluated in this Phase I ESA (collectively referred to as the Site) consisted of the above-mentioned quarter sections and parcels (see Section 1.0 “Introduction”). The Site was situated between 50 Avenue as the western boundary to approximately 800 m east of 40 Avenue as the eastern boundary; and 67 Street as the northern boundary to approximately 52 Street as the southernmost boundary.

The following general observations were made regarding the Site:

- The Lloydminster Water Treatment Plant (WTP) was situated within the northwest corner of the Site, in the north portion of NW ¼ 11-50-28 W3M.
- Portions of LSD 4-11-50-28 W3M, which comprised the southwest corner of the Site, consisted of light industrial properties and contained the former COL Public Works Shop and Lloydminster Agricultural Exhibition grounds (the latter was not included in this Phase I ESA).
- The lot within LSD 4-11-50-28 W3M which was situated at 5709 – 50 Avenue, Lloydminster, Saskatchewan and was largely vacant and contained a two-storey building that did not appear to be in use. The lot was historically operated as the COL WTP.
- The remaining portions of the Site, which were made up of LSD 3, 5, 6 of11-50-28-W3M, SE ¼ 11-11-50-28 W3M, NW ¼ 12-11-50-28 W3M, SW ¼ 12-11-50-28 W3M, and NW ¼ 1-11-50-28 W3M, largely consisted of agricultural cropland with scattered low-lying sloughs and some rural residential developments.

Current zoning at the Site, as per the COL Land Use District and Overlay Map (dated August 2018) is as follows:

- **S ½ 11-50-28 W3M**: UT – Urban Transition
- **W ½ 12-50-28 W3M**: UT – Urban Transition
- **NW ¼ 11-50-28 W3M and NW ¼ 1-50-28 W4M**: I1 – Light Industrial

Definition of the above zones according to the COL Land Use Bylaw (5-2016):

Urban Transition: The purpose of this district is to allow for a limited range of agricultural and rural land use activities in an undeveloped state and awaiting urban development and utility servicing.

Light Industrial: The purpose of this district is to allow for light industrial developments that create no nuisance factor outside an enclosed building.

Figure 1, Appendix A, shows the approximate Site location on a 2020 aerial photograph.

4.2 SITE TOPOGRAPHY AND DRAINAGE

The following observations were made with regard to topography and drainage:

- A northbound storm drainage channel was situated in the northwest portion of the Site within NW ¼ 11-50-28 W3M. The channel originated offsite to the west of 50 Avenue and entered the Site directly northeast of 62 Street and 50 Avenue and extended to west of the access road to the COL WTP, where it crossed 67 Street via culvert to continue flowing northwards.
- The land around the cell at the COL WTP in the northwest portion of the Site sloped down towards the surrounding environment.
- The agricultural lands within the Site consisted of rolling terrain and drainage was expected to follow Site topography.
- A northbound drainage channel was situated along the eastern boundary of the property.
- The former COL Public Works Yard was generally flat.
    - The west section of the yard gently sloped to the south.
    - A naturally occurring drainage channel was noted in the gravel surface and appeared to be sloped downwards to the south.
    - The east section of the yard sloped downwards to the east. Drainage was expected to follow Site topography.

No other significant observations regarding drainage and topography were made.

4.3 ADJACENT LAND USE

The adjacent land use was noted based on observations made during the Site visit as well as a review of the COL Land Use District and Overlay Map (dated August 2018) and Land Use Bylaw (5-2016). The surrounding land usage is summarized in Table 1 below.

Table 1: Surrounding Land Usage

Direction	Land Use
North	A portion of the lands to the north (section S ½ 14-50-28 W3M) were located outside of the City limits. These lands generally appeared to be a mix of agricultural cropland, rural residential land, and commercial land. The land north of the northeast portion of the Site (SW ¼ 13-50-28 W3M) was zoned under *PU - Public Utility* and was operated as the COL Landfill and WWTF.
East	The lands to the east were outside of the City limits. They appeared to be agricultural cropland.
South	The land to the south of the southeast portion of the Site was zoned under *I1 Light Industrial* and was developed as an industrial subdivision. The land to the south of the central and western portions of the Site was zoned under *UT Urban Transition* and consisted of the Lloydminster Agricultural Exhibition grounds, Lloydminster Golf and Curling Club, and Lloydminster Cemetery
West	The lands to the west of the Site consisted of commercial and industrial properties and were zoned under *I1 Light Industrial, I2 Medium Industrial, and C5 Service Commercial.*

As per the COL Land Use Bylaw, the following definitions are provided:

Medium Industrial: The purpose of this district is to provide for industrial uses that carry out a portion of their operations outdoors.

Service Commercial: The purpose of this district is to provide for commercial and industrial businesses that operate in such a manner that no nuisance factor is created.

5.0 REGIONAL GEOLOGY

The surficial geology at the Site and surrounding area is characterized by fluted moraine, which consists of furrowed and ridged land features comprised mainly of till (sand, silt, clay, and gravel)[2].

Bedrock in the area belongs to the Lea Park Formation, which consists of mudstone, siltstone, sandstone, and bentonite[3].

[2] Simpson, M.A. (compiler) (1997): Surficial geology map of Saskatchewan; Sask. Energy/Mines/Sask. Researc. Counc., 1: 1 000 000 scale.

[3] Macdonald, R. and Slimmon, W.L. (compilers) (1999): Geological map of Saskatchewan; Sask. Industry and Resources, 1: 1 000 000 scale.

6.0 RECORDS SEARCH AND REVIEW

Several sources of records were searched and reviewed. The sources and findings are discussed in the following subsections.

6.1 AERIAL PHOTOGRAPHS

Aerial photographs of the Site and surrounding area were obtained to determine the historic land use and development. Aerial photographs were obtained through the National Air Photo Library, Alberta Environment and Parks (AEP)-Air Photo Services, as well Google Earth Pro.

As aerial photographs do not provide a continuous record of Site development, it is possible that features of interest may have been present on Site but removed between the dates of coverage. In addition, photographic quality and scale are variable and may make features difficult to identify or their purpose difficult to establish.

Aerial photographs that were reviewed included the years 2020, 2011, 2001, 1988, 1975, 1965, 1956, and 1950. Reproduction of these specific photographs is provided in Figures 1 to 8 (Appendix A). A summary of the aerial photograph review is provided in Table 2.

Table 2: Historical Aerial Photograph Review

Year	Scale	Description
1950	NA	Note: The north portions of S ½ 11-50-28 W3M, SW ¼ 12-50-28 W3M, and all of NW ¼ 11-50-28 W3M and NW ¼ 12-50-28 W3M were not visible in this aerial photograph. • The Site appeared to be largely undeveloped agricultural land with some treed areas. • A body of water was noted in SW ¼ 11-50-28 W3M. • A roadway was observed intersecting SE ¼ 11-50-28 W3M in a northwest/southeast orientation. • A dugout was observed in SE ¼ 11-50-28 W3M. • Rural residential developments were noted in SE ¼ 12-50-28 W3M and NW ¼ 1-50-28 W3M surrounded by treed land. • The land to the south of SW ¼ 11-50-28 W3M appeared to have been developed and an oval track was observed along with approximately 12 rectangular buildings (likely present-day Lloydminster Agricultural Exhibition). The land was intermixed treed and grassland, along with an area that was likely the present-day Lloydminster cemetery. • What appeared to be residential areas were noted to the southwest across a roadway (likely present-day 50 Avenue). • A railway right-of-way (ROW) was noted immediately to the south of NW1/4 1-50-28 W3M and possibly extended north on the west side of NW ¼ 1-50-28 W3M and through SE ¼ 11-50-28 W3M.
1956	NA	Note: The north portions of NW ¼ 11-50-28 W3M and NW ¼ 12-50-28 W3M were not visible in this aerial photograph. • A linear man-made feature was noted in W ½ 11-50-28 W3M in a northwest/southeast orientation (likely former Lloydminster Airport airstrip). • A small square building was noted in the south portion of SW ¼ 11-50-28 W3M. • A rural residential property was noted in the northeast corner of SE ¼ 11-50-28 W3M. • Developments of unknown nature (possibly commercial/industrial) were noted directly to the west of SW ¼ 11-50-28 W3M. • No other significant changes to the Site or surrounding properties were noted from what was observed in the 1950 aerial photograph.
1965	1: 31,680	Note: Only NW ¼ 12-50-28 W3M was visible in this aerial photograph. • The visible portion of the Site consisted of agricultural cropland. • The lands to the west, north, and east also appeared to be agricultural cropland. • No other items of significance were noted on the Site or surrounding properties.

1975	1: 15,840	Note: The eastern portions of NW ¼ 12-50-28 W3M, SW ¼ 12-50-28 W3M, and NW ¼ 1-50-28 W3M were not visible in this aerial photograph. • A large square lagoon and small square building with access from a roadway to the north (likely present-day 67 Street) were noted within the north portion of NW ¼ 11-50-28 W3M (likely present-day COL WTP). • A rural residential property was noted to the south of the square lagoon with access from 50 Avenue to the west. • A paved airstrip was noted intersecting W ½ 11-50-28 W3M and the former Lloydminster Airport was noted in the south portion of SW ¼ 11-50-28 W3M. Ten new buildings (likely hangars) along with nine visible airplanes were noted in the southwest corner of SW ¼ 11-50-28 W3M. • A new industrial development was noted in the west portion of SW ¼ 11-50-28 W3M and consisted of a building and storage yard to the east and south (likely present-day former COL Public Works Shop and Yard). Parked vehicles were observed on the north side of the building and various indiscernible objects were noted in the yard. • A rural residence and farm along with multiple round objects (likely grain silos) were noted on the north boundary of SE ¼ 11-50-28 W3M. • No other significant changes to the Site were noted from what was observed in the 1965 aerial photograph. • A new industrial development was noted to the west of SW ¼ 11-50-28 W3M and consisted of a rectangular building surrounded by a yard that contained vehicles and other indiscernible objects. • An industrial property was noted directly west of the former COL Public Works Shop and contained two rectangular buildings (one large and one small) along with various indiscernible objects in the yard and along the perimeter. A square building was also noted further west near 50 Avenue. • Lagoons along with a square building and a circular object (likely a water storage tank) were noted southwest of the former COL Public Works Shop and (likely former COL WTP). • A large industrial development was noted west of NW ¼ 11-50-28 W3M and a large circular tank was noted along with a building that appeared to be in development (possibly present-day Foremost). • A development was noted across 67 Street to the north of the Site and consisted of a rectangular building with associated infrastructure to the north (possibly present-day Diamond 7 Meats). • The remaining land to the north consisted of rural residential and agricultural cropland. • No other significant changes to the surrounding properties were noted from what was observed in the 1965 aerial photograph.

1988	1: 10,000	Note: Only portions of W ½ 11-50-28 W3M were visible in this aerial photograph. • An additional wing was noted on the south side of the former COL Public Works Shop. • Soil stockpiles were observed east of the former COL Public Works Yard. • The airstrip observed in the previous aerial photographs appeared to be in the process of being removed. • The former Lloydminster Airport appeared to have undergone changes as new buildings were noted and some old buildings were no longer observed. • No other significant changes to the Site were noted from what was observed in the 1975 aerial photograph. • A new industrial subdivision was noted to the west of NW ¼ 11-50-27 W3M past 50 Avenue along with a roadway (likely present-day 62 Street). • A manmade body of water was noted further west (likely present-day Lake V Park). • New industrial buildings were noted to the west between 49 and 50 Avenue (northwest of the former COL Public Work Shop). • A new building was noted on the industrial property that was observed to the west of the former COL Public Works Shop in the 1975 aerial photograph. • The lagoons which were noted in the 1975 aerial photograph were no longer observed. • New large buildings/additions were noted on the land to the south (present-day Lloydminster Agricultural Exhibition). • A large new development was noted to the south (likely present-day Lloydminster Golf and Curling Club). • No other significant changes to the surrounding properties were noted from what was observed in the 1975 aerial photograph.

2001	1: 30,000	• A new building was noted to the northeast of the square lagoon in the north portion of NW ¼ 11-50-28 W3M (likely part of present-day COL WTP). • A new yard was observed directly east of the old yard belonging to the former COL Public Works Shop. A structure was noted at the north end of the yard and stockpiles were noted in the central and south portions. • No other significant changes to the Site were noted from what was observed in the 1988 aerial photograph. • New long rectangular objects (possibly truck trailers or modular trailers) were noted directly to the west of the former COL Public Works Shop, between 49 and 50 Avenue. • New industrial developments were noted to the west of SW ¼ 11-50-28 W3M past 50 Avenue. • Some of the buildings that were previously noted on the Lloydminster Agricultural Exhibition grounds to the south were no longer observed. • New industrial developments were noted to the south and southwest of NW ¼ 1-50-28 W3M across the railway. • A well lease was noted in the southeast corner of NE ¼ 11-50-28 W3M. • No other significant changes to the surrounding properties were noted from what was observed in the 1988 aerial photograph.
2011	NA	• Six (6) round, white objects were observed to the south of the former COL Public Works Shop (likely aboveground storage tanks). Various equipment and vehicles were noted in the western yard and stockpiles were observed in the eastern yard. • No other significant changes to the Site were noted from what was observed in the 1988 aerial photograph. • An electrical substation was noted to the southwest of the former COL Public Works Shop • Multiple industrial properties and shops were noted to the north of 62 Street along 49 Avenue. • The industrial property that was noted to the west of the former COL Public Works Shop, across 49 Avenue, appeared to have been cleared of structures and a vacant graded yard was observed. • Four industrial developments were observed directly to the south of NW ¼ 1-50-28 W3M. • Pipelines were noted directly to the east of NW ¼ 1-50-28 W3M (possibly oil and gas infrastructure). • A well lease was noted to the north of NW ¼ 11-50-28 W3M across 67 Street. • The COL Landfill and Wastewater Treatment Facility (WWTF) was noted to the north of NW ¼ 12-50-28 W3M. • No other significant changes to the surrounding properties were noted from what was observed in the 2001 aerial photograph.

2020	NA	• The round, white tanks that were noted to the south of the former COL Public Works Shop in the 2011 aerial photograph were no longer observed. The equipment and soil stockpiles that were noted in the yard in the previous aerial photographs were no longer observed. • White objects were scattered east and northeast of the yard. Their nature could not be discerned. • Multiple greyish objects were noted directly east of the yard. Their nature could not be discerned. • No other significant changes to the Site were noted from what was observed in the 2011 aerial photograph. • A new industrial building was noted directly west of the former COL Public Works Shop. • A new development was noted directly north of the former COL Public Works Shop (likely a fill station). • The round tank that was noted to the southwest of the former COL Public Works Shop in the previous aerial photographs was no longer observed. • No other significant changes to the surrounding properties were noted from what was observed in the 2011 aerial photograph.

The potential for environmental impact to the Site from the railway ROW, suspected ASTs in the former COL Public Works Yard, electrical substation to the southwest of the former COL Public Works Shop, presence of oil and gas infrastructure, presence of the COL Landfill and WWTF is discussed in Section 10 “Summary of Findings and Discussions”.

6.2 LAND TITLES

SolidEarth reviewed available historical land titles dating back to 11 January 1974 to identify current and previous landowners. Land title searches were obtained from Information Services Corporation. A summary of the ownership history is provided in Table 3 below. Copies of the reviewed land titles are provided in Appendix B.

Table 3: Site Ownership History

Site Ownership	Time Period
NW ¼ 11-50-28 W3M	
City of Lloydminster	11 January 1974 to Present
SE ¼ 11-50-28 W3	
City of Lloydminster	22 December 2011
Lawrence Raymond Leach and Christina Ramsay Leach	27 July 2006 to 22 December 2011

LSD 3-11-50-28 W3M	
City of Lloydminster	18 January 1995 to Present
LSD 4-11-50-28 W3M	
City of Lloydminster	6 August 2002 to Present
LSD 5-11-50-28 W3M	
City of Lloydminster	6 August 2002 to Present
LSD 6-11-50-28 W3M	
City of Lloydminster	22 December 2011 to Present
NW ¼ 12-50-28 W3M	
City of Lloydminster	30 January 1989 to Present
SW ¼ 12-50-28 W3M	
City of Lloydminster	5 February 1988 to Present
NW ¼ 1-50-28 W3M	
City of Lloydminster	30 December 2004 to Present
Rocky Robert Payne	18 June 1993 to 30 December 2004
Lot 1, Block 1, Plan 90B11438	
City of Lloydminster	30 December 2004 to Present
Bernard William Payne	8 January 2004 to 30 December 2004
Viterra Inc.	23 October 2002 to 8 January 2004
Saskatchewan Wheat Pool	13 August 1990 to 23 October 2002
Block A, Plan 71B02795	
City of Lloydminster	1 November 2002 to Present
Block A, Plan 102084409	
City of Lloydminster	15 May 2012
Block Z, Plan 60B09193	
City of Lloydminster	18 July 2014 to Present

No items of concern were identified in the historical land title review.

6.3 SASK SPILLS DATABASE

The SaskSpills Program database was reviewed for information regarding storage of hazardous materials and contaminant spills. The search was limited to the quarter sections within the Site and the surrounding quarter sections.

The search revealed the following:

Onsite

- A spill occurred on 24 May 2002 (incident #2002-0112) in NW1/4 12-50-28 W3M and involved the release of 30,000 L of crude oil. No other information was provided.

Offsite

- Incident #120368 occurred on 27 June 2012 at the Lloydminster Landfill in SW ¼ 13-50-28 W3M (north of the northeast portion of the Site) and involved the release of an unidentified contaminant. No other information was provided.

The potential for environmental impact to the Site from the records identified above is discussed in Section 10 “Summary of Findings and Discussion”.

6.4 SASKATCHEWAN UPSTREAM OIL AND GAS SPILL DATABASE

A review of the Saskatchewan Upstream Oil and Gas Spill Database, an online database provided by the Government of Saskatchewan - Ministry of the Energy and Resources, was conducted for information relating to nearby oil and gas spill sites. The search was conducted for the Site and surrounding quarter sections. The following records were identified:

Onsite Incidents

- Incident #4707 on 8 June 1998 involving the release of 44 m^3 of oil from a Husky Oil Operations Pipeline in LSD 6-11-50-28 W3M. It was reported that 42 m^3 was recovered and reclamation was completed.
- Incident #7554 on 25 May 2002 involving the release of 40 m^3 of oil from a Canadian Natural Resources Limited (CNRL) pipeline in LSD 14-12-50-28 W3M. No recovery data was reported, and it was indicated that the reclamation was completed.
- Incident #12155 on 24 June 2008 involving the release of 0.17 m^3 of crude oil and water from a Husky Oil Operations Limited pipeline in LSD 11-1-50-28 W3M. No recovery data was provided, and reclamation was completed.

- Incident #18856 on 14 February 2017 involving the release of 2 m^3 of oil in LSD 14-12-50-28 W3M. The incident was reported as closed and no other information was provided in the record.

Offsite Incidents

- Incident #19971119 involving the release of 26 m^3 of oil from a tank in LSD 16-11-50-28 W3M. The incident occurred on infrastructure listed to Lash Oil Company Ltd. and it was reported that 10 m^3 of the material was recovered using a vacuum truck.
- Incident #1460 on 8 September 1993 on a well lease listed to Koch Exploration Canada ULC in LSD 3-14-50-28 W3M. It was reported that 5 m^3 of oil was released (all recovered) and reclamation was completed.
- Incident #6339 on 19 October 2000 involving the release of 29 m^3 of water and 1 m^3 of oil on a CNRL well lease on LSD 1-14-50-28 W3M. It was reported that 5.5 m^3 of material was recovered and reclamation was completed.
- Incident #10537 on 25 August 2006 involving the release of 0.703 m^3 of unspecified fluid, which was completely recovered. The incident occurred in connection with a Husky Oil Operations Limited well lease in NE ¼ 1-50-28 W3M (east of Site). Reclamation was completed.
- Incident #13684 on 14 August 2010 involving the release of 100 m^3 of unspecified fluid from a CNRL flow line in LSD 15-12-50-28 W3M (east of Site). Reclamation was completed.
- Incident #14416 on 18 July 2011 involving the release of 3 m^3 of oil from a facility listed to Emerge Oil & Gas Inc. in LSD 13-1-50-28 W3M. All material released was reported as recovered and reclamation was completed.

The potential for environmental impact to the Site from the records identified above is discussed in Section 10 “Summary of Findings and Discussion”.

6.5 ALBERTA ENVIRONMENTAL SITE ASSESSMENT REPOSITORY (ESAR)

An online search of the AEP-*Environmental Site Assessment Repository* (ESAR) database was completed to identify technical information about assessed and/or reclaimed sites and remediation/reclamation certificates. The search was limited to the properties to the west of the Site located on the Alberta side of the border (within 300 m of the Site).

The following records were identified:

Husky Fuel Station and Car Wash – 5906 - 50 Avenue, Lloydminster, Alberta

The most recent document associated with this property was a Phase III ESA completed by Dillon Consulting Ltd. (report dated 28 March 2003). A Preliminary Site Assessment by HBT AGRA Limited (30 March 1993) and Phase II ESA by ESG Environmental Solutions Group Ltd. (15 September 2001) were also completed at the property. The Phase III ESA report provided the following information:

- The scope of the Phase III ESA consisted of delineating hydrocarbon contamination in the vicinity of USTs at the property.
- Five (5) boreholes were advanced and two (2) groundwater monitoring wells were installed.
- Soil and groundwater samples were collected and submitted for benzene, toluene, ethylbenzene, and xylene (BTEX), petroleum hydrocarbon fractions F1 – F4 and F1 – F2, respectively.
- Samples were compared against *Risk Management Guidelines for Petroleum Storage Tank Sites* (Alberta Environment, 2001).
- All of the samples collected met criteria for the tested parameters. No further recommendations were made.

North Side Fas Gas Service Station – 5640 – 50 Avenue, Lloydminster, Alberta

The most recent document pertaining to this property was a Groundwater and Subsurface Vapour Monitoring program completed by Stantec Consulting Ltd. (Stantec; report dated 3 February 2010). The report provided the following information:

- Eleven (11) assessments/monitoring events were historically completed by Jacques Whitford Environmental Limited (JWEL) and Jacques Whitford AXYS Ltd. (JWA) beginning with the removal of USTs at the property in 2000 to a Spring 2009 Groundwater Monitoring/Sampling Program.
- The Stantec program consisted of purging and sampling two (2) onsite vapour wells and 12 groundwater monitoring wells.
- Gas samples were collected and submitted for analytical chemistry testing for BTEX and petroleum hydrocarbons (PHC).
- Groundwater samples were collected and submitted for analytical chemistry testing for BTEX, F1 – F2.
- The program identified continued PHC impacts to the groundwater on the property near the building and pump islands.

- Hydrophobic and oxygen release compound (ORC) socks were installed in Spring 2009 at monitoring well locations to enhance bioremediation.
- Stantec recommended delineation of the zone of impacted soil and groundwater followed by the development of a remedial action plan (RAP) to eliminate contaminant sources and reduce PHC concentrations. No other recommendations were made.

No other records were found within the specified search parameters. A copy of the AER search is provided in Appendix B.

The potential for environmental impact to the Site from the records identified above is discussed in Section 10 “Summary of Findings and Discussion”.

6.6 NATIONAL POLLUTANT RELEASE INVENTORY

The National Pollutant Release Inventory (NPRI) database was searched for information relating to substance releases. The NPRI is Canada’s legislated, publicly accessible inventory of pollutant releases (to air, water, and land), disposals, and transfers for recycling. The search was limited to the Site and adjacent LSDs (within 300 m of the Site).

The search did not reveal records of substance releases within the specified search parameters.

A copy of the NPRI search is provided in Appendix B.

6.7 WATER WELLS

The Saskatchewan Water Security Agency *Online Driller Reports* database was reviewed to obtain information regarding water wells that may be present on the Site and surrounding lands within approximately 400 m of the Site boundary.

A total of 43 water wells were found within the specified search parameters.

A copy of the search results is provided in Appendix B.

6.8 CANADIAN LEGAL INFORMATION INSTITUTE

The Canadian Legal Information Institute (Canlii) is a non-profit organization that was created by the Canadian Federation of Law Societies that provides access to legal cases, legislation, and documents, and spans multiple legal databases.

A search of the Canlii database was completed to find cases or documents relating to the current or previous owners of the Site under the context of the Alberta Environmental Protection and Enhancement Act (EPEA).

The search did not reveal any records within the specified search parameters. A copy of the search results is provided in Appendix B.

7.0 CORRESPONDENCE WITH GOVERNMENT AGENCIES

SolidEarth initiated correspondence with government agencies/officials to gather information about the history and operation of the site. A summary of this task is provided below.

A copy of the correspondence received is presented in Appendix B.

7.1 SASKATCHEWAN MINISTRY OF ENVIRONMENT (SKMOE)

The Government of Saskatchewan - Ministry of Environment, Environmental Protection Division was contacted under the Freedom of Information and Protection of Privacy Act for available information relating to environmental incidents, spills, soil and groundwater contamination, enforcement orders, prosecutions, and bulk storage tank records at the Site.

The search identified the following records:

Report ID 2015-04-30OT114518 - Incident on 30 April 2015

The incident involved the discharge of 250 grams of fluorescein (green dye) into stormwater management system. The impacted location includes 67 Street and the Legion ball diamond. It was understood that the fluorescein fluorescent compound dissipated overtime. No other records were found in relation to this incident.

Report ID 2015-09-26T092301 - Crude Oil Discharge on 26 September 2015

The incident involved the release of 100 L of crude from a tank trailer near a COL water fill station (near 49 Avenue and 57 Street; exact location unknown). It was indicated that the spill was cleaned up with spill pads and vacuum truck and stained surficial gravel was removed and disposed.

Environmental Investigation - UST Removal and Excavation Monitoring - Former COL Shop - 5905 49 Avenue by HBT AGRA Limited (HBT) - 23 December 1993 - Project no. AE03463

Two USTs (1,000 and 250 gallons) were removed from the former COL Public Works Shop sometime prior to 2 November 1993. The following information was provided:

- The 250-gallon tank was located directly north of the northwest building corner. The 1,000-gallon tank was located directly south of the central portion of the building.
- HBT monitored excavations on 2 and 3 November 1993 (USTs had already been removed but the exact date was not provided).
- Samples collected from the walls and bases of both excavations.

- Criteria used at the time are *Decommissioning of Petroleum Storage Facilities - Saskatchewan Environment and Public Safety* (Draft 1990).
- All samples met criteria with the exception of one sample collected from the north excavation, where total petroleum hydrocarbons (TPH) were measured at 310 mg/kg and exceeded Level 1 criteria (TPH Level 1 criteria is 40 mg/kg).
- No other recommendations were provided.

Discharge ID 2016-02-03T171057 - 3 February 2016

The incident involved two frac-outs that occurred in the northeast corner of NW ¼ 12-50-28-W3M during the horizontal drilling of a Husky Oil Operations Limited pipeline. The following information was provided:

- The first incident occurred on 3 February 2016 and involved the release of freshwater gel that impacted an approximate area of $10m^2$.
- The second incident occurred on 4 February 2016 and also involved the release of freshwater gel.
- Summit Liability Solutions (Summit) conducted sampling on 11 February 2016 and collected two (2) confirmatory samples from the release area and two (2) control samples from the nearby agricultural area.
- Confirmatory soil samples met *Saskatchewan Upstream Sites Remediation Guidelines* (SPIGEC4, 2009).
- No further actions were recommended.

Discharge ID 2017-02-14T142502 – 14 February 2017

The incident involved the release of $2m^3$ of crude oil from a tank trailer into the ditch on the south side of 67 Street, directly south of the COL WWTF.

- This record was identified by SKMOE as well as through the Saskatchewan Upstream Oil and Gas Spill Database (see incident #18856 in Section 6.4 “Saskatchewan Upstream Oil and Gas Spill Database”).
- It was indicated that the spill was cleaned up under supervision of COL staff and post cleanup soil and groundwater sampling was conducted by X-Terra.
- Impacted soils were removed on 14 and 16 February 2017 (approximately 41 tonnes of soil removed) and confirmatory soil samples were submitted for analytical chemistry testing for BTEX, F1 - F4 and met the chosen Alberta Tier 1 Soil and Groundwater Remediation Guidelines (AB Tier 1 Guidelines) (February 2016).
- Surface water samples were collected from the drainage channel both upstream and downstream of the release point and were submitted for PHCs. It was indicated that the concentration of PHCs were below the analytical method detection limits. The direction of water flow in the drainage channel was indicated to have been to the north.
- No further action was recommended.

Discharge ID 2017-06-1010T141549 – Discharge at COL WWTF on 10 June 2017

The incident involved the discharge of treated effluent sewage water from the COL WWTF lagoons due to excessive rainfall. No other relevant information (i.e. quantity of release and precise location of release) was provided in the record.

The correspondence received indicated that the search has identified no records of such concerns.

The potential for environmental impact to the Site from the records identified above is discussed in Section 10 “Summary of Findings and Discussion”.

7.2 CITY OF LLOYDMINSTER

The City of Lloydminster was contacted for available records regarding development permits, bylaw infractions, or any environmental-related incidents pertaining to the Site. The COL records identified the following:

Previous ESAs Completed along Highway 17/50 Avenue

Phase I ESA - 47 to 62 Street along HWY 17 (50 Avenue) and 49 Avenue - Thurber Engineering - 11 March 2011 - File No. 19-598-352

The Phase I ESA identified the following items of potential concern:

- Presence of two service stations west of 50 Avenue west service road
- City of Lloydminster Public Works Yard
- ATCO Electric Ltd. substation
- Husky Oil pipeline south of 60 Street and north of 57 Street
- Former Lloydminster airport hangars
- Former water treatment plant and sewage lagoons
- L & L Oilfield and Sandstone Centre Truck Wash

The Phase I ESA recommended a soil/groundwater investigation program to confirm the presence of contamination from the mentioned items.

Geotechnical Investigation - HWY 17 Couplet - Thurber Engineering - 29 April 2011 - File No. 19-598-353

Fourteen (14) boreholes were drilled between 55 Street and 62 Street along 50 Avenue - no signs of impact were noted in any of the borehole logs.

Phase II ESA - HWY 17 Couplet - Thurber Engineering - 35 to 44 ST and 57 to 62 ST – 30 September 2011 - File No. 19-598-367

The Phase II ESA provided the following information:

- Twelve (12) test holes were advanced between 57 and 62 Street.
- Soil samples were collected and Submitted for BTEX, F1 - F4, metals, salinity, and polychlorinated biphenyls (PCB).
- All soil samples met CCME 2008 criteria for PHCs.
- All samples met CCME 2011 Canadian Environmental Quality Guidelines (CEQG) and 2010 AB Tier 1 Guidelines for a commercial land use setting for BTEX, F1 - F4, metals, and PCBs.
- Two (2) soil samples from TH11-7 did not meet CCME 2011 CEQG for electrical conductivity. These samples were collected from 2.25 and 3 mbgs from area of 5709 – 50 Avenue (Lot SE, Block Sec10, PlanT50-R28-W3).

Previous ESAs Completed at Former COL Public Works Shop and Yard

Building Hazardous Materials Report - Former COL Public Works Yard - COL (5905 – 49 Avenue) Lloydminster, Saskatchewan - EcoVision Consulting Group Inc (EcoVision), 8 December 2014 - Project No. 2014169

The report identified the following items in relation to the former COL Public Works Shop building:

- No asbestos-containing materials (ACM) were identified in collected samples.
- Lead samples collected fell below regulatory limits and did not require abatement.
- PCB-containing light ballasts were found.
- Suspected mercury containing materials (fluorescent light bulbs, thermostats) were found. The report recommended that suspected mercury-containing equipment be disposed of or recycled.
- Radioactive components were not identified in the building.
- No urea foam formaldehyde insulation (UFFI) was present.
- Mould was observed in the building. The report recommended that the extent of mould growth be assessed prior to sale, renovation, or demolition.
- ODS containing equipment were noted in the building. The report recommended that ODS equipment be handled, recycled, and disposed.
- Waste oil remained in the hydraulic hoist in the building and would need to be removed.

Phase I ESA - 5905 - 49 Avenue - EcoVision - 15 December 2014 - Project No. 2014170

The Phase I ESA identified the following items of potential concern:

- Former USTs removed between 1988 and 1990 due to leakage (actual date of removal was prior to November 1993 as reported in Section 7.1 “Saskatchewan Ministry of Environment SKMOE”).
- Fueling area consisting of a pump island and ASTs in the yard to the south of the building.
- Ground staining was identified throughout the yard.
- Contaminants were identified in the floor drain of the main garage bay adjacent to the main gate.
- An in-floor hydraulic lift remained in the main garage bay with oil still present.
- ODS and mercury containing equipment were identified in the building.

The Phase I ESA recommended a Phase II ESA to investigate some of the above items.

Phase II ESA - 5905 50 Avenue - Ecovision - 15 April 2015 - Project No. 2015016

The Phase II ESA consisted of drilling seven (7) boreholes, installed seven (7) groundwater monitoring wells, and advancing 13 test pits. The following information was identified:

- Twenty-two (22) soil samples were collected and submitted for analytical testing for salinity.
- Twenty-three (23) soil samples were collected and submitted for analytical testing for BTEX, F1 - F4.
- Eight (8) groundwater samples were collected and submitted for analytical testing for BTEX, F1 - F2, dissolved metals, total and fecal coliforms, CCME routine water chemistry, biochemical oxygen demand (BOD), chemical oxygen demand (COD), and dissolved organic carbon (DOC).
- Soil PHC impacts were detected in the northwest portion of yard by the shop building and in the eastern yard. Soil impact summary:
    - High concentrations of benzene were detected in BH6 at 4 mbgs (by former pump island).
    - High concentrations of F2 and F3 were detected in TPD-01 at 0.5 mbgs (north of BH6 in the northwest corner of the yard).
    - High concentrations of F3 were detected in GS-1 (taken from the eastern yard).
- Groundwater impact summary:
    - benzene and ethylbenzene concentrations exceeded criteria in MW06 by pump island.
    - Total coliforms exceeded criteria by MW03, which was located northeast of the yard.
    - Manganese, selenium, and uranium concentrations were above criteria in all groundwater samples.
    - Boron and copper concentrations were above criteria in MW01.
    - Cadmium concentrations were above criteria in MW02 and 03.

- Copper concentrations were above criteria in MW07.
- All samples exceeded sulphate, sodium, manganese, TDS.

Conclusions:

- Onsite surficial and deeper PHC, chloride, and nitrate impacts were identified.
- Offsite chloride and nitrate impacts were identified to the east of the yard (downgradient).

Site Remediation Plan - 5905 - 49 Avenue - EcoVision - 9 May 2015 - Project No. 2015083

A Remediation Plan (RP) was prepared by EcoVision and presented the following recommendations:

- Excavation and disposal of impacted soils in the storage yard. Impacted soils were expected to range from 1 to 2 mbgs with an estimated volume of 100 to 200 m^3.
- Installation of a retention pond with site grading to minimize offsite contaminated runoff as well as the installation of an additional groundwater monitoring well downstream of the retention pond.
- Completing biannual monitoring of the groundwater monitoring wells and testing for potability and salinity.
- Competition of a closure report following remedial activities.

Borrow Evaluation Near 40 Avenue and 52 Street – Hardy BBT Limited Project No. AX03198 – 11 October 1989

A borrow evaluation was completed by Hardy BBT Limited and involved the excavation of three (3) test pits in NW1/4 1-50-28 W3M. No signs of impacted soil were noted in the report.

Development Permits at the Site

The COL records also identified development permit applications and issued permits for residential, commercial, and public utility developments within NW ¼ 11, NW ¼ 12, SW ¼ 11, and SW ¼ 12 of 50-28 W3M. No items of concern were identified.

The potential for environmental impact to the Site from the above items identified in the COL records is discussed in Section 10 “Summary of Findings and Discussions”.

8.0 SITE VISIT

SolidEarth Environmental Technologists conducted a visual inspection of the site on 30 July 2020. Observations made are summarized below. Photographs taken during the Site visit are presented in Appendix C.

8.1 SITE STRUCTURES

At the time of the visit, multiple structures were noted throughout the Site and are summarized below:

LSD 3, 4, 5, and 6 of 1-50-28 W3M and Vacant Lot at 5709 – 50 Avenue

The former COL Public Works Shop and Yard was observed in LSD 4-11-50-28 W3M and the former COL WTP building was observed at 5709 – 50 Avenue, Lloydminster, Saskatchewan.

Summary of observations made in former COL Public Works Shop:

- The former COL Public Works Shop was located on the east side of 49 Avenue.
- The building was industrial in nature and consisted of a central two-storey office area with two attached industrial wings to the south and east.
- The building was constructed on top of a concrete slab.
- The building was connected to water, electricity, and natural gas utilities.
- Heating was provided by a natural gas-powered forced air furnace in the office and garage bays. Radiative pipes and suspended heaters were also identified in the garage bays.
- The building contained 12 garage bays. The south bays were generally empty; however, tools and equipment were stored in the east bays including furniture, minor debris, wooden pallets, metal racks, empty drums, industrial and construction related tools, tarps, and vehicle wash fluids, as well as other miscellaneous items.
- Oil dispensers were situated in the eastern wing. They did not appear to be connected to any ASTs at the time.
- The concrete floor of the garage bays was stained; however, no major signs of damage (i.e. large cracks) were observed. Dirt and debris were observed on the floors throughout the building.
- No major signs of damage were observed to the building walls or floors.

Summary of observations made at sheds to the east of the former COL Public Works Shop:

- A green shed with a white garage door was located directly to the east of the shop. The shed was closed at the time of the visit.
- A long open storage shed was located to the east of the green shed. The south side of the shed was open and it was empty at the time of the visit.
- No signs of concern were noted near either shed.

Summary of observations at former COL WTP building:

- The building exterior was grey, black, and orange and it was two-stories high.
- No signs of damage were observed to the building exterior.
- The interior of the building was not available for observation.
- No signs of concern were noted around the building exterior.

NW ¼ 11-50-28 W3M

The new COL WTP and associated buildings were noted on the north end of the quarter section in the northwest corner of the Site. The COL WTP buildings were protected by a chain-link fence that also prevented access to the buildings. No observations were made.

A number of abandoned houses were noted in a fenced area directly southwest of the COL WTP cell.

- Access to this area was via an access road from 50 Avenue to the west. The area was protected by a gated, chain-link fence.
- The houses were vacant and appeared to be in a state of disrepair; direct observations of their interiors were not made.
- Junk cars, two Sea-can containers, and various articles of furniture were noted in the northwest corner of the area.
- No major signs of concern were noted.

SE ¼ 11-50-28 W3M

A rural residential property was noted at the north end of the quarter section in a central portion of the Site. A residence along with storage sheds and grain silos were noted from the property's access road. No major signs of concern were noted.

SW ¼ 12-50-28 W3M

A paintball business "Gopher Hill Paintball" was noted on the west side of SW ¼ 12-50-28 W3M in the east central portion of the Site. The business property was protected by a gated fence and observations were made from 40 Avenue.

- The area appeared to be largely grassed and tree covered.
- Green Sea-can containers were assembled at the entrance.
- Picnic benches and lawnmowers were noted.

- No major signs of concern were noted.

No other major structures were noted on the Site.

The potential for environmental impact to the Site from the above items identified is discussed in Section 10 “Summary of Findings and Discussions”.

8.2 SITE APPEARANCE

LSD 3, 5, and 6 of 11-50-28 W3M

- LSD 3 appeared to consist of agricultural cropland as observed from east of the former COL Public Works Yard. Direct access to the LSD was not possible at the time. No major signs of concern were noted.
- LSD 4 contained the former COL Public Works Shop and Yard in the northern half and the Lloydminster Agricultural Exhibition grounds in the southern half (excluded from this Phase I ESA).
    - The former Public Works Yard was divided into western and eastern portions separated by a chain-link fence.
    - The western yard was largely empty at the time of the visit and was gravel covered. Some invasive vegetation growth was noted in the south portion of the western yard.
    - A concrete wash pad was noted near the yard entrance along with a square catch basin. The wash pad was partly covered in sediment at the time of the visit. No stains or odours were noted.
    - A storage area with concrete blocks along the north, and south walls was noted on the east side of the western yard. It was empty at the time of the visit and no stains or odours were noted.
    - A concrete pad was noted on the eastern side of the western yard and appeared to have been formerly used for a tarped storage area (i.e. Quonset). A portion of the pad was covered with coarse uniform gravel with minor invasive vegetation growth. No stains or odours were noted.
    - A concrete pad was noted to the south of the shop and was connected to underground electricity. The pad appeared to be the location of former fuel pumps. None of the former fueling infrastructure remained other than yellow safety barriers and an aboveground electrical outlet.
    - Groundwater monitoring wells with red metal stickup casing were noted in the yard.

- The eastern yard was generally empty with the exception of concrete blocks stored at the southeast corner.
- The eastern yard was gravel covered and no stains, discolorations, or odours were noted.

SE ¼ 11, NW ¼ 12, SW ¼ 12, and NW ¼ 1 of 50-28 W3M

- These portions of the Site appeared to consist almost entirely of agricultural cropland with minor interspersed tree stands and low-lying sloughs. At the time of the visit, these portions of the Site were planted with canola and wheat.
- No major signs of concern including disturbances, spillage, staining, discolorations, patchy vegetation, or odours were noted.

NW ¼ 11-50-28 W3M

- The central portion of contained a low-lying slough.
- The southern half and northeast corner consisted of agricultural pastureland.
- The northwest portion was largely occupied by the COL WTP which was inaccessible.
- No major signs of concern including disturbances, spillage, staining, discolorations, patchy vegetation, or odours were noted.

Block A, Plan 102084409

- This parcel was situated to the west of NW ¼ 11-50-28 W3M and was facing 50 Avenue and 67 Street.
- The parcel was part of the highway corridor and contained a drainage channel that flowed northwards.
- No major signs of concern were noted.

5709 – 50 Avenue

- This parcel was situated to the west of LSD 4-11-50-28 W3M and was between 49 and 50 Avenue.
- The parcel was generally flat and contained the former COL WTP building.
- The parcel was generally grass covered. The south portion of the parcel was gravel covered and was a former water fill station.
- No signs of concern were noted.

8.3 APPEARANCE OF SURROUNDING PROPERTIES

The lands adjacent to the Site were visually inspected from the perimeter of the Site to identity evidence of environmental contamination in the form of soil disturbance, waste storage/spillage, staining or discoloration of soils and hazardous or chemical materials. A summary of observations of the surrounding properties is provided in Table 4 below.

Table 4: Observations of Surrounding Land

Direction	Observations
North	• The Site was bound to the north by 67 Street followed by agricultural cropland. • Diamond 7 Meats was situated north of the northwest portion of the Site along with a residence several hundred metres due east. • An oil and gas lease was situated approximately 100 m north of NW ¼ 11-50-28 W3M. Large black storage tanks were noted on the lease. • The COL Landfill and WWTF was situated north of the northeast portion of the Site. • No signs of staining, discolorations, or odours were detected from the northern Site boundary.
East	• The land to the east consisted of agricultural cropland. • A Husky Oil Operations Limited lease was observed approximately 40 to 50 m east of the southeast portion of the Site. The land around the lease was gravel covered and generally flat. No signs of staining, discolorations, or odours were detected. • In general, no signs of concern were noted.

South	• The lands to the south consisted of a mix of industrial, commercial, and recreational lands. • The land to the south of the southwest portion of the Site consisted of the Lloydminster Agricultural Exhibition grounds. ○ The grounds contained multiple shop-type buildings as well as a larger rectangular building further south. The grounds were downgradient of the former COL Public Works Yard and were protected by a chain-link fence. ○ The land around the shops/garages was used for storing various equipment including Sea-can containers, metal racks, bricks, waste bins, pallets, cattle fencing and chutes, and straw piles. ○ No signs of concern were noted. • The land to the south of the central portion consisted of the Lloydminster Golf and Curling Club. The land was partly grass-covered and partly treed. No signs of concern were noted. • The lands to the south of the southeast portion of the Site consisted of commercial/industrial properties with large shops and storage yards. ○ Direct observation of the properties from the south side of the Site was not possible due to the topography and the presence of the rail ROW. ○ The property south of the southwest corner of NW ¼ 1-50-28 W3M was a Peterbilt truck dealership. The yard was filled with transport trucks along the perimeter. ○ No signs of concern were noted.
West	• The properties to the west were generally commercial/industrial in nature. • The properties to the west of the northwest portion consisted of (from north to south): ○ Foremost ○ Bottle Depot ○ TEK Mechanical Ltd. ○ RL Electric Motor Rewinding Ltd. ○ Feldspar ○ South Ridge Playschool. • Industrial businesses were also situated west of the Site, along the east side of 50 Avenue. They included: ○ Sandstone Centre Truck Wash ○ Messer Canada Inc. ○ Paladin Security ○ Double Edge Rentals ○ Vertex ○ Apex Distribution Inc. ○ L & L Oilfield Construction ○ Kichton Contracting Ltd. ○ Lloydminster Source

	○ Reid Design ○ Relay Distributing ○ AGAT Laboratories ○ STRAND • The Sandstone Centre was directly adjacent to the western Site boundary. ○ The property contained a large industrial building surrounded by a gravel yard to the south, east, and north. ○ Transport trucks were parked in the eastern portion of the yard. ○ No signs of staining, discolorations, or odours were noted. • The L & L Oilfield yard was directly adjacent to the western Site boundary. ○ The yard was gravel covered and protected with a chain-link fence. ○ The yard contained Sea-can containers, pipe racks, and other equipment. • No stains, discolorations, or odours were noted. • The Kichton Contracting Ltd. property was directly adjacent to the western Site boundary. A white AST and multiple chemical storage bins were noted in the Kichton Contracting Ltd. yard along the southern and eastern perimeters. ○ The AST did not appear to be in used and no signs of damage, staining, or odours were detected. • The chemical bins (possibly vehicle oil) were placed on wooden pallets. No staining, discolorations, or signs of spillage were noted. • The industrial property operated by Reid Design, STRAD, AGAT Laboratories, and Lloydminster Sources was directly west of the Site and was situated between 49 and 50 Avenue. ○ The property contained a large industrial building with multiple garage bays surrounded by a gravel yard. ○ The yard contained numerous plastic objects of an unknown purpose stacked along the eastern property boundary. ○ A transformer was noted along the eastern property boundary. • The lands to the west of the Site on the western side of 50 Avenue included: ○ North Border Husky and Car Wash ○ Precision Contractors ○ Country Quilts and Stitches

The potential for environmental impact to the Site from the oil and gas leases, AST, and chemical bins in Kichton yard is discussed in Section 10 “Summary of Findings and Discussions”.

8.4 BULK STORAGE TANKS

No bulk storage tanks were observed during the Site visit.

8.5 CHEMICAL STORAGE AND HANDLING

No major chemical storage and handling was identified during the Site visit.

8.6 WASTE HANDLING AND DISPOSAL

No waste handling and disposal were noted during the Site visit.

8.7 HYDRAULIC HOISTS AND ELEVATORS

An underground hydraulic hoist was observed in the former COL Public Works Shop. The hoist was located in the floor in the east wing of the shop portion of the building.

The potential for environmental impact to the Site from the underground hydraulic hoist identified above is discussed in Section 10 “Summary of Findings and Discussions”.

8.8 SUMPS AND DRAINS

Drains were noted inside the former COL Public Works Shop building. The drains were noted in the south and east wings. Due to metal covers, the interiors of the drains were not directly observed.

Two large sumps were noted in the wash bay (bay #12), located at the east end of the east wing. The sumps were covered with metal grates and were filled with sediment. No liquids or odours were detected. No major signs of damage to the sump walls were observed.

The potential for environmental impact to the Site from the sumps and drains identified above is discussed in Section 10 “Summary of Findings and Discussions”.

8.9 HAZARDOUS MATERIALS AND EQUIPMENT

No hazardous or radioactive materials were observed during the Site visit.

8.10 SPECIAL ITEMS

Based on information contained in the Hazardous Building Materials report summarized in Section 7.2 “City of Lloydminster”, the following hazardous materials were suspected or confirmed:

- PCBs (confirmed)
- Mould (confirmed)
- Mercury-containing materials (suspected)

- ODS (confirmed)

The report also indicated that ACM, lead-based paints (LBP), and UFFI were not present in the building (ACM and LBP were verified as not present through sampling and testing of building materials by EcoVision).

No major odour, noise, or vibration concerns were noted during the Site visit.

Herbicide or pesticide usage was suspected within the agricultural portions of the Site during the visit.

Radon is a tasteless, odourless, invisible gas that could be associated with building materials or native/fill soils. Specialized equipment is generally required for its detection. It is not known if a radon survey had been undertaken at this Site.

The potential for environmental impact to the Site from mould, PCB-containing ballasts, mercury-containing materials, and ODS is discussed in Section 10 “Summary of Findings and Discussions”.

8.11 OTHER ITEMS

No other items of significance were observed.

9.0 INTERVIEWS

SolidEarth conducts interviews with individuals familiar with the history and operation of the Site to seek information of any environmental concern associated with the Site of which they are aware.

A brief in-person interview was conducted with Mr. Nick Dunstan with COL regarding the former COL Public Works Shop and Yard. The interview revealed the following:

- The shop building had been infested with mice and posed a human health hazard due to the presence of droppings throughout.
- The shop building was historically used for storing pipe and utility repair related work.
- No major renovations were undertaken.
- The green shed to the east of the shop was used for storing traffic signs.
- The Quonset on the east side of the western yard was used for seasonal storage.
- No waste incineration was historically conducted on the property.
- The concrete storage pad on the east side of the western yard was used for storing aggregates.

- The concrete pad on the west side of the western yard (near the access gate) was used for washing street sweeping vehicles.
- Road salts were historically stored in the eastern yard.

No other information was provided.

Email correspondence with Mr. Anthony Andre with the COL identified the following:

- The area protected with a chain-link fence and containing what appeared to be old residential homes in disrepair (identified during the Site visit to the south of the existing COL WTP, see Section 8.0 “Site Visit”) was operated by the Fire Department as a fire training facility. The Fire Department would no longer be using this property for training purposes as of the end of August 2020.
- No remediation or additional investigations have been undertaken at the former COL Public Works Shop and Yard since the most recent assessment completed by EcoVision in May 2015.

The potential for environmental impact to the Site from items identified above is discussed in Section 10 “Summary of Findings and Discussions”.

10.0 SUMMARY OF FINDINGS AND DISCUSSIONS

There were no findings associated with the following issues:

- Asbestos Containing Materials
- Lead and Lead-Based Paint
- Urea Formaldehyde Foam insulation
- Nuisance, odours, vibrations, and noise
- Air and water emissions
- Radon
- Groundwater wells
- Pipelines, oil and gas installations, and spills
- Chemical storage and handling
- Hazardous materials and equipment
- Waste handling and disposal

Findings associated with the current/historical operation of the Site and surrounding properties are noted below. The locations of areas of potential concern that were considered to pose a moderate to high risk of environmental impact to the Site are shown on Figure 9.

Historical Operations Site

Remaining Items of Concern Identified at the Public Works Shop and Yard

Records provided by the COL identified previous ESAs that were completed by EcoVision at the COL Public Works Shop and Yard.

- Items of concern identified in the yard included the historical presence of USTs (removed at some time before November 1993), fueling area with ASTs, and ground staining.
- Items identified inside the building included contaminants in the building floor drains, an in-floor hydraulic lift (with waste oil still in place), ODS and mercury containing equipment, mould, and PCB containing light ballasts.
- The Phase II ESA completed in April 2015 identified onsite PHC, chloride, and nitrate impacts as well as offsite chloride and nitrate impacts to the northeast and downgradient of the yard.

EcoVision prepared a Site Remediation Plan in May 2015 that recommended excavation and disposal of impacted soils in the yard and installation of a retention pond to minimize offsite runoff. Based on the available information as of the issuance of this report, remediation of the site as per these recommendations has not been completed and the environmental health of the Site remains impacted.

In-floor Hydraulic Lift in COL Public Works Shop

An in-floor hydraulic lift was identified by EcoVision in 2014 and by SolidEarth during the current Phase I ESA. Hydraulic lifts operate using hydraulic fluids, the composition of which can vary between petroleum hydrocarbons, water, mineral oils, and phosphate esters. As such, the environmental impact posed by hydraulic lift systems is partly based on the properties of the fluids in use such as their toxicity and biodegradability. It is also based on the condition of the in-ground containment and whether any leaks or malfunctions have occurred in the past.

Given the age of the portion of the building where the sump was located (constructed at some time between 1956 and 1975), it was suspected that the fluids within these lifts would have likely been hydrocarbon based. As such, the potential risk of environmental impact to the soil and groundwater in the vicinity of the hoist was considered high.

Fire Department Training Grounds

Email correspondence with COL identified a Fire Department training area located south of the existing COL WTP. The access road leading to this area was located on the east side of 55 Avenue approximately 500 m south of 67 Street.

Fire fighting training activities in the past may have involved the usage of fire fighting foams that contain chemicals that pose an impact to human and environmental health. Key compounds of concern that are associated with fire fighting foams are Perfluoro-alkylated substances (PFAS), which are known to pose a human and environmental health hazard. In 2008 Canada prohibited the use, sale, and import of Perfluoro-octane sulfonic acid (PFOS – a specific type of PFAS) or PFOS-containing products with exceptions for products used in fire fighting and the military as well as some ink and photo media use.

Based on this information, the potential for environmental impact to the Site was considered high.

Spill Incidents from Oil and Gas Infrastructure and Other Miscellaneous Events

A review of records provided by the SaskSpills Database, Saskatchewan Upstream Oil and Gas Spill Database, Saskatchewan Ministry of Environment, and COL identified 12 spill incidents that have occurred on the Site. A summary of the incidents in chronological order is provided below:

- Incident #4707 on 8 June 1998 involving the release of 44 m^3 of oil from a Husky Oil Operations Pipeline in LSD 6-11-50-28 W3M. It was reported that 42 m^3 was recovered and reclamation was completed. Based on the date of occurrence and information provided in the record indicating the spill was remediated/reclaimed, the potential for environmental impact to the corresponding portion of the Site was considered low.
- A spill occurred on 24 May 2002 (incident #2002-0112) in NW ¼ 12-50-28 W3M (northeast portion of the Site) and involved the release of 30,000 L of crude oil. No other relevant information was provided in this record, including involved parties or remediation status. Based on this information, the potential for environmental impact to the corresponding portion of the Site was expected to be high.
- Incident #7554 on 25 May 2002 involving the release of 40 m^3 of oil from a Canadian Natural Resources Limited (CNRL) pipeline in LSD 14-12-50-28 W3M (northeast portion of the Site). No recovery data was reported, but reclamation was indicated to have been completed. No other records regarding this spill were found. Based on this information, the potential for environmental impact to the corresponding portion of the Site was considered moderate.
- Incident #12155 on 24 June 2008 involving the release of 0.17 m^3 of crude oil and water from a Husky Oil Operations Limited pipeline in LSD 11-1-50-28 W3M. No recovery data

was provided, but reclamation was indicated to have been completed. Based on the relatively small quantity released and the reclamation status, the potential for environmental impact to the corresponding portion of the Site was considered low.

- Discharge ID 2015-04-30OT114518 occurring on 30 April 2015 and involving the release of 250 grams of fluorescein into the local stormwater management system and migrating to the outflow ducts located near the Legion ball diamond. It was further understood that fluorescein is widely used in applications involving the tracing of water sources and is generally not considered hazardous. Based on this information, the potential for environmental impact to the corresponding portion of the Site was considered low
- Discharge ID 2015-09-26T092301 occurring on 26 September 2015 and involving the release of 100 L of crude from a tank trailer near a COL water fill station (near 49 Avenue and 57 Street, the exact location was not provided). It was indicated that the spill was cleaned up using spill pads and vacuum truck and the stained surficial gravel was removed and disposed. Based on the information provided indicating that the spill was cleaned up and affected soils were removed, the potential for environmental impact to the corresponding portion of the Site was considered low.
- Discharge ID 2016-02-03T171057 occurring on 3 February 2016 and involving two frac-outs that occurred in the northeast corner of NW ¼ 12-50-28-W3M during the horizontal drilling of a Husky Oil Operations Limited pipeline. Summit conducted sampling on 11 February 2016 and collected two (2) confirmatory samples from the release area and two (2) control samples from the nearby agricultural area. Confirmatory soil samples met SPIGEC4, 2009 criteria. No further actions were recommended by Summit. Based on this information, the potential for environmental impact to the corresponding portion of the Site was considered low.
- Incident #18856 (SKMOE discharge ID 2017-02-14T142502) on 14 February 2017 involving the release of 2 m^3 of oil in LSD 14-12-50-28 W3M. The release occurred from a tank trailer into the ditch on the south side of 67 Street, directly south of the COL WWTF. Post spill activities involved excavation and removal of impacted soils (approximately 41 tonnes of soil were removed). Confirmatory soil and surface water sampling conducted by X-Terra indicated that concentrations of BTEX, F1 – F4, and PHCs were below AB Tier 1 Guidelines and no further remedial actions were recommended by X-Terra. Based on this information, the potential for environmental impact to the corresponding portion of the Site was considered low.

Herbicide Usage on Agricultural Portions of Site

The usage of herbicides on agricultural cropland is common practice in the area and its usage was suspected onsite. Herbicides are generally considered safe when used in accordance with manufacturer prescribed dosages and application rates. Based on this information, the potential for environmental impact to the Site from suspected herbicide usage was expected to be low.

Historical Operation of Surrounding Properties

Spill Incidents from Oil and Gas Infrastructure and Other Miscellaneous Events

- Incident #19971119 on 19 November 1997 involving the release of 26 m^3 of oil from a tank in LSD 16-11-50-28 W3M (east of NW ¼ 11-50-28 W3M and west of NW ¼ 12-50-28 W3M). The incident occurred on infrastructure listed to Lash Oil Company Ltd. and it was reported that 10 m^3 of the material was recovered using vacuum truck. No other information was provided. Based on the available records, the potential for environmental impact to the northwest portion of NW ¼ 12-50-28 W3M, which is the portion of the Site closest to the incident release location, was considered moderate.
- Incident #1460 on 8 September 1993 on a well lease listed to Koch Exploration Canada ULC in LSD 3-14-50-28 W3M. It was reported that 5 m^3 of oil was released, all of which was recovered, and reclamation was completed. Based on this information, the potential for environmental impact to the north portion of the Site (NW ¼ 11-50-28 W3M and NW ¼ 12-50-28 W3M) was considered low.
- Incident #6339 on 19 October 2000 involving the release of 29 m^3 of water and 1 m^3 of oil on a CNRL well lease on LSD 1-14-50-28 W3M. It was reported that 5.5 m^3 of material was recovered and reclamation was completed. Based on the nature of the material released, its distance from the Site, and completed reclamation, the potential for environmental impact to the north portion of the Site (NW ¼ 11-50-28 W3M and NW ¼ 12-50-28 W3M) was considered low.
- Incident #10537 on 25 August 2006 involving the release of 0.703 m^3 of unspecified fluid, which was completely recovered. The incident occurred in connection with a Husky Oil Operations Limited well lease in NE ¼ 1-50-28 W3M (east of the Site). Reclamation was reported to have been completed. Based on this information, the potential for environmental impact to the Site was considered low.
- Incident #13684 on 14 August 2010 involving the release of 100 m^3 of unspecified fluid from a CNRL flow line in LSD 15-12-50-28 W3M (east of the northeast portion of the Site). Reclamation was reported to have been completed. Based on the volume of material spilled and lack of any other information, the potential for environmental impact to the northeast portion of the Site (east portion of NW ¼ 12-50-28 W3M9 was considered moderate.
- Incident #14416 on 18 July 2011 involving the release of 3 m^3 of oil from a facility listed to Emerge Oil & Gas Inc. in LSD 13-1-50-28 W3M (east of the southeast portion of the Site). All material released was reported as recovered and reclamation was completed. Based on this information, the potential for environmental impact to the Site was considered low.
- Incident #120368 occurred on 27 June 2012 at the Lloydminster Landfill in SW ¼ 13-50-28 W3M (north of the northeast portion of the Site) and involved the release of an unidentified contaminant. No other information was provided. Based on this information,

and the presence of the COL Landfill to the north, the potential for environmental impact to the northeast portion of the Site was considered moderate.

- Discharge ID 2017-06-1010T141549 occurring on 10 June 2017 and involving the discharge of treated effluent sewage water from the COL WWTF lagoon due to excessive rainfall. No other relevant information (i.e. quantity of release and precise location of release) was provided in the record. Based on the available information indicating that the material released was treated effluent and the distance of the lagoons from the Site (approximately 220 m), the potential for environmental impact to the corresponding portion of the Site was considered low.

Electrical Substation to the southwest of the former COL Public Works Shop

Based on the historical aerial photograph review, an electrical substation was identified to the southwest of the Site (2011 and 2020 aerial photographs). The substation would have been deployed at some time between 1988 and 2011.

Substations typically contain electrical transformers, which could potentially contain PCBs which are known to pose risks to environmental and human health. The use of PCBs in Canada was banned in 1971; however, equipment containing PCBs that was still in service has been allowed to remain in place until the end of service life.

Based on the date the substation was installed (sometime between 1988 and 2011), distance of the station from the Site, which is approximately 80 to 100 m from 5709 – 50 Avenue (southwest lot within the Site boundaries), and the limited mobility of PCBs due their hydrophobic nature, the potential for environmental impact to the southwest corner of the Site was considered low.

Railway Right-of-Way (ROW) South and West of NW ¼ 1-50-28 W3M

The typical activities at a railway involve the transport of cargo and materials. As such, the primary environmental concern with such activities would involve the spillage of hazardous materials (e.g. crude oil) during transport. The secondary environmental concern associated with the presence of a railway is the migration of polycyclic aromatic hydrocarbons (PAH) from creosote-coated railway ties.

No records of spillage in connection with the railway were found in the historical record review. Additionally, the railway was approximately 20 to 40 m from the southern and western boundaries of NW ¼ 1-50-28 W3M (southeast portion of the Site), which would make the migration of PAH to the Site relatively unlikely (significant PAH lateral migration from railway ties does not typically exceed several metres). Based on this information, the potential for environmental impact from the historical existence of the railway was considered low.

Industrial Properties to the West along 49 Avenue

Industrial operations were situated to the west of the Site and included Sandstone Centre (truck wash), Kichton Contacting Ltd. (construction contracting), and L & L Oilfield (oil and gas services). Kichton Contracting Ltd. and L & L Oilfield were located uphill of the western portion of the Site and surface runoff from was expected to flow to toward the Site. At the time of the visit, ASTs (fuel and chemicals/oil) were noted in the Kichton yard.

Based on these observations, the potential for environmental impact to the Site from these operations was considered low to moderate.

Impacted Sites to the West of 50 Avenue

A search of the Alberta ESAR database identified records of two impacted fuel station properties located at 5906 – 50 Avenue (Husky Fuel Station and Car Wash) and 5640 – 50 Avenue (North Side Fas Gas), Lloydminster, Alberta.

- At Husky Fuel Station and Car Wash, a Phase III ESA was completed by Dillon Consulting Ltd. in March 2003 and indicated that soil and groundwater samples met Alberta Environment (2001) guidelines for BTEX, F1 – F4. No further recommendations were made in the Phase III ESA.
- At North Side Fas Gas, a Groundwater and Subsurface Vapour Monitoring program completed by Stantec in February 2010 and identified PHC impacts to the groundwater near the onsite building and pump islands. Stantec recommended delineation of the zone of impacted soil and groundwater followed by the development of a remedial action plan (RAP) to eliminate contaminant sources and reduce PHC concentrations. No other recommendations were made.

Based on the distance of these two properties from the Site (approximately 150 to 200 m), the potential for environmental impact to the Site was considered low.

11.0 RECOMMENDATIONS

Based on the information provided in this report, the potential for environmental impact to specific portions of the Site was considered high. The impacted portions are identified below:

COL Public Works Shop and Yard

Information provided in the previous ESAs completed by EcoVision identified remaining PHC, chloride, and nitrate impacts in the COL Public Works Yard that have yet to be remediated. Items of concern were also identified inside the building including the in-floor hydraulic lift, contamination in the drains, and hazardous building materials.

Based on this information, the following recommendations are made with regard to the COL Public Works Shop and Yard:

- The remediation of the remaining impacted areas of the yard and implementation of the measures recommended by EcoVision.
- Appropriate safety procedures be implemented and followed prior to any renovation or demolition activities regarding the shop building, due to the confirmed presence of mould, mice infestation and droppings (potential viral hazard), PCB-containing ballasts, ODS, and mercury containing materials.
- A Phase II ESA is recommended to assess the potential for onsite impacts due to the presence of the in-floor hydraulic lift and contaminated drains. The Phase II ESA would consist of drilling boreholes inside the building in the vicinity of the hydraulic lift to assess the condition of nearby soil and groundwater.

Fire Fighting Training Grounds Located – Within a Portion of NW ¼ 11-50-28 W3M

A Phase II ESA is recommended to confirm the presence/absence of impacted soils and groundwater from the historical usage of the aforementioned property as a fire fighting training ground.

NW ¼ 12-50-28 W3M (Northeast Portion of the Site)

Two onsite and three offsite spill incidents were identified that create a potential for environmental impact to the northeast portion of the Site and ss such, a Phase II ESA is recommended in order to confirm the presence/absence of PHC impacts in the northeast portion of the Site. The Phase II ESA would consist of drilling boreholes along the perimeter of the northeast portion of the Site to assess the condition of the soil and groundwater.

LSD 4 and 5 of 11-50-28 W3M (Western Portion of the Site)

The western portion of the Site was adjacent to industrial properties that were situated upgradient of the Site. Impacted runoff from historical spills or leaks (if any) on these properties would likely flow toward the Site. As such, a Phase II ESA is recommended at the western boundary of LSD 4 and 5 of 11-50-12 W3M and would consist of drilling boreholes along the perimeter of the northeast portion of the Site to assess the condition of the soil and groundwater.

12.0 CLOSURE

This report was prepared for the exclusive use of the City of Lloydminster for the specific application described in this report. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. This report is subject to the scope, time and budget limitations, and contract terms and conditions outlined in the proposal and established between SolidEarth and the City of Lloydminster for this project. This report has been completed within the generally accepted assessment practices. No other warranty expressed or implied is provided.

Should additional parties require reliance on this report, written authorization from SolidEarth will be required, and all third parties will be bound by the contractual agreement established between SolidEarth and the City of Lloydminster for this project. Provided that the report is less than one year old, SolidEarth will issue reliance letters to third parties upon payment of applicable fees and agreement by third parties to accept the contractual terms and conditions established with the City of Lloydminster. SolidEarth has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

This report was based on the conditions of the Site encountered at the time of the Site visit on 30 July 2020, a review of historical information and data obtained by SolidEarth as described in this report, and discussions with owner/occupant(s), as outlined in the report. Our findings cannot and should not be extended to other portions of the Site or structures which were not reasonably available, in SolidEarth's opinion for observation. SolidEarth will not have any obligation to update this report should additional information become available to SolidEarth after the date the report was issued, unless specifically agreed to in writing.

The report is based on data and information collected by SolidEarth as described in the report. In evaluating the property, SolidEarth has relied in good faith and to a large degree on information provided by other individuals noted in this report including the current owner/occupant. SolidEarth has assumed that the information provided is factual and accurate. No attempt has been made to verify the accuracy of any information provided. SolidEarth accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

The Phase I ESA may assist in reducing, but not eliminating, uncertainty about potential environmental liabilities associated with the Site. Due to the limitations stated above, different environmental conditions may exist from what was observed during the completion of this assessment. Should such a situation arise, SolidEarth should be given the opportunity to review such information and determine if modification to the findings, conclusions, and recommendations is warranted.

SolidEarth makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

Thank you for giving us the opportunity to be of service. If you have any questions or require additional information, please feel free to contact our office.

Respectfully submitted,
SolidEarth Geotechnical Inc.

Alex Khamis, B.Sc., EP
Environmental Professional

Jay Jaber, M.Sc., P.Eng.
Senior Geo-environmental Engineer
Managing Partner

Signatures found on original report

13.0 STATEMENT OF QUALIFICATIONS

Jay Jaber, M.Sc., P.Eng., Senior Geo-Environmental Engineer

Mr. Jay Jaber, M.Sc., P.Eng., is a geo-environmental engineer with over 25 years of engineering consulting experience. He holds a Master's degree in geotechnical engineering from the University of Texas in Austin and is a registered professional engineer in the provinces of Alberta and Saskatchewan.

Mr. Jaber's experience includes: (i) Environmental engineering including environmental site assessment, groundwater monitoring, and remediation and re-development programs; (ii) Geo-environmental engineering including the design of landfill liners and caps, lagoons, and containment systems; (iii) Geotechnical engineering for infrastructure projects including pipeline alignment, roadways, and utilities upgrade projects; (iv) Foundation engineering for bridges, heavy industrial plants, commercial developments, and high rise buildings; (v) Slope stability engineering for deep excavation, embankments over weak soils, and natural slopes; and (vi) Materials engineering and testing for infrastructure, heavy foundations, and roadway projects.

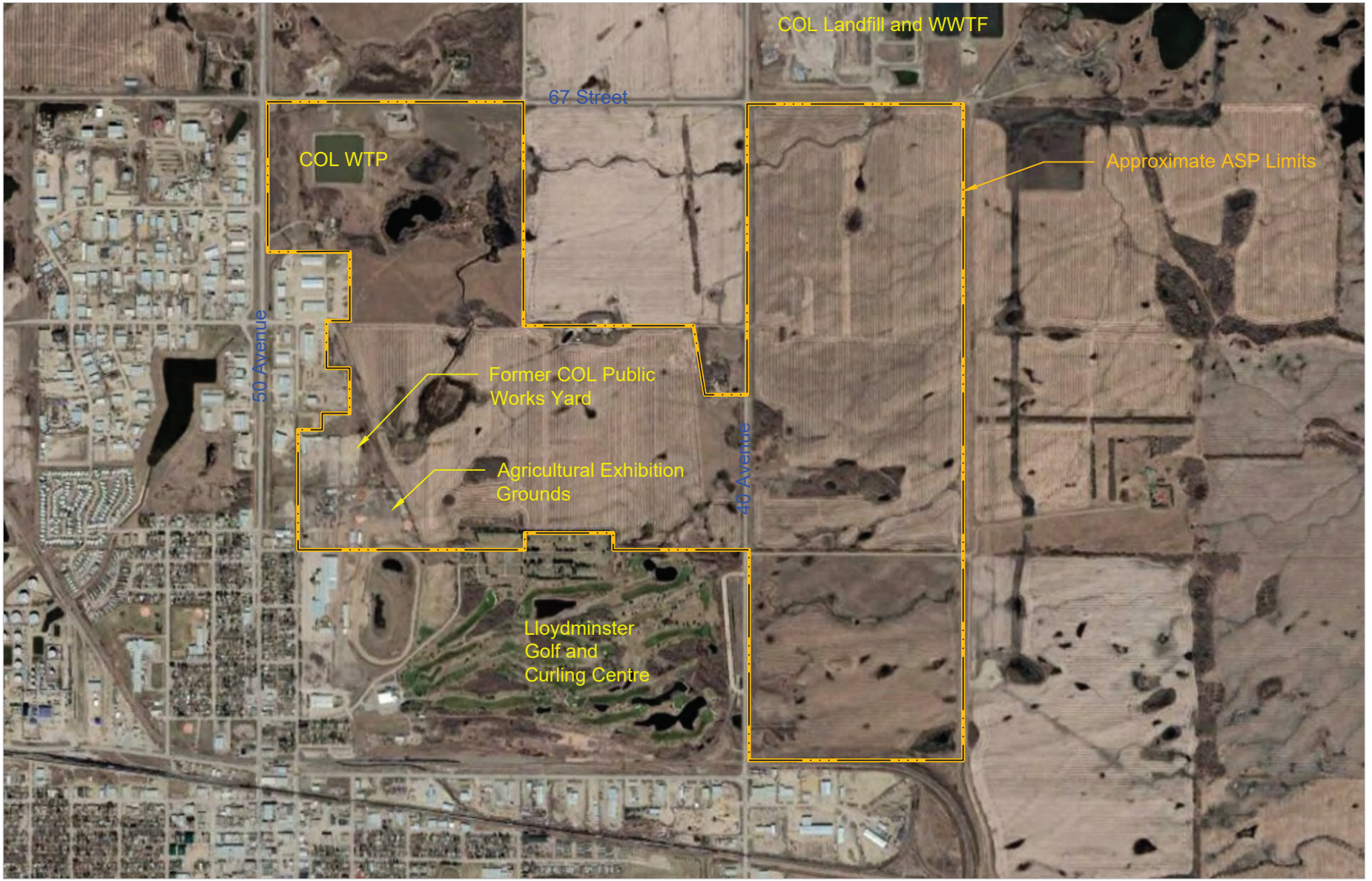
Mr. Alex Khamis, B.Sc., EP, Environmental Professional

Mr. Alex Khamis, B.Sc., EP, is an environmental professional with over seven years of environmental consulting experience. He holds a Bachelor's degree in General Sciences from the University of Alberta in Edmonton and is a registered environmental professional with ECO Canada.

Mr. Khamis's experience includes environmental site assessments (Phase I, II, and III ESAs), remediation programs, groundwater monitoring for landfills, and environmental monitoring activities in support of civil construction projects.

Appendix A

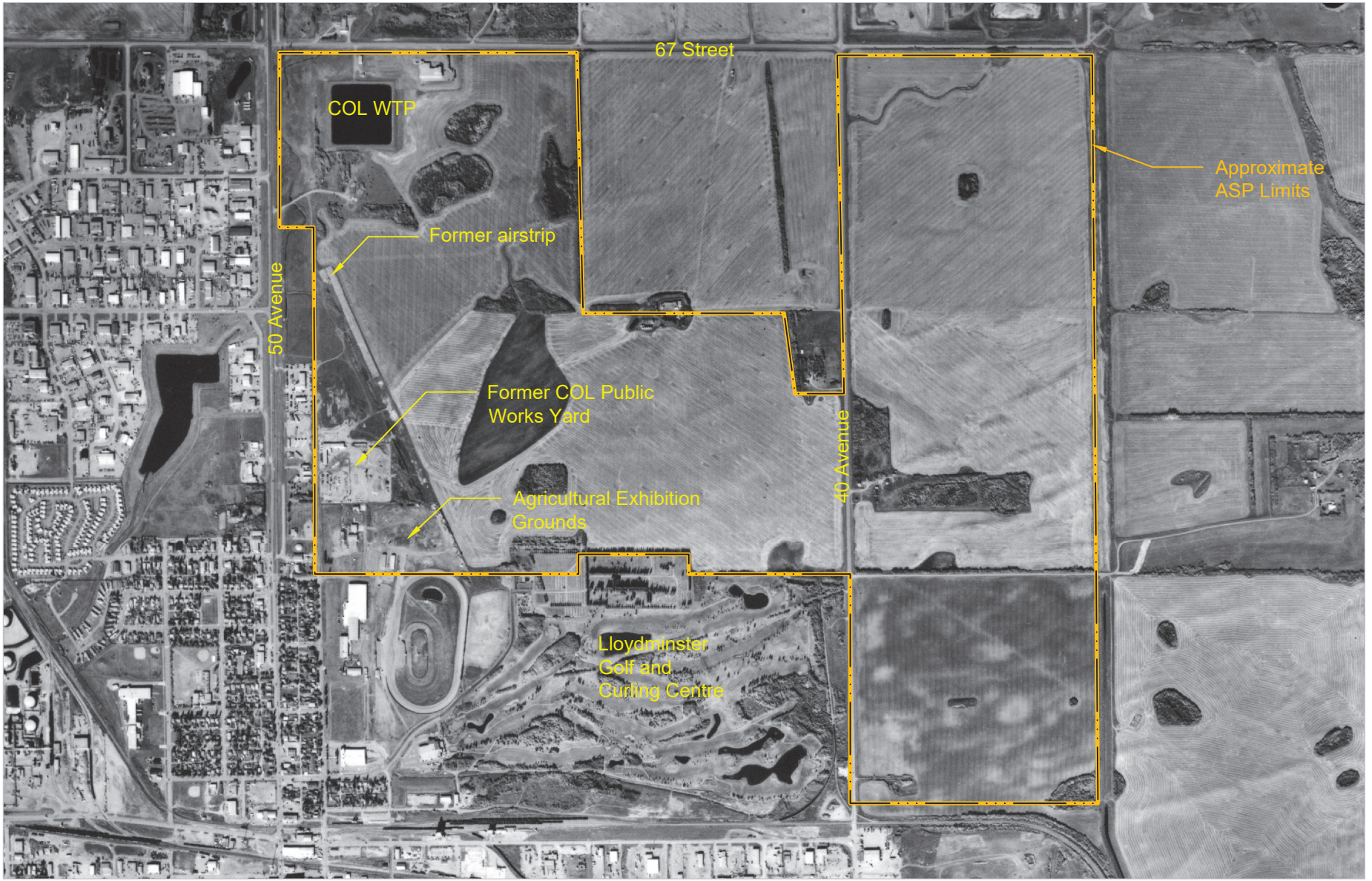
Historical Aerial Photographs



SCALE: NTS	DRAWN BY: AK	FIGURE No.: 1	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Site Location Shown on a 2020 Aerial Photograph	



SCALE: NTS	DRAWN BY: AK	FIGURE No.: 2	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
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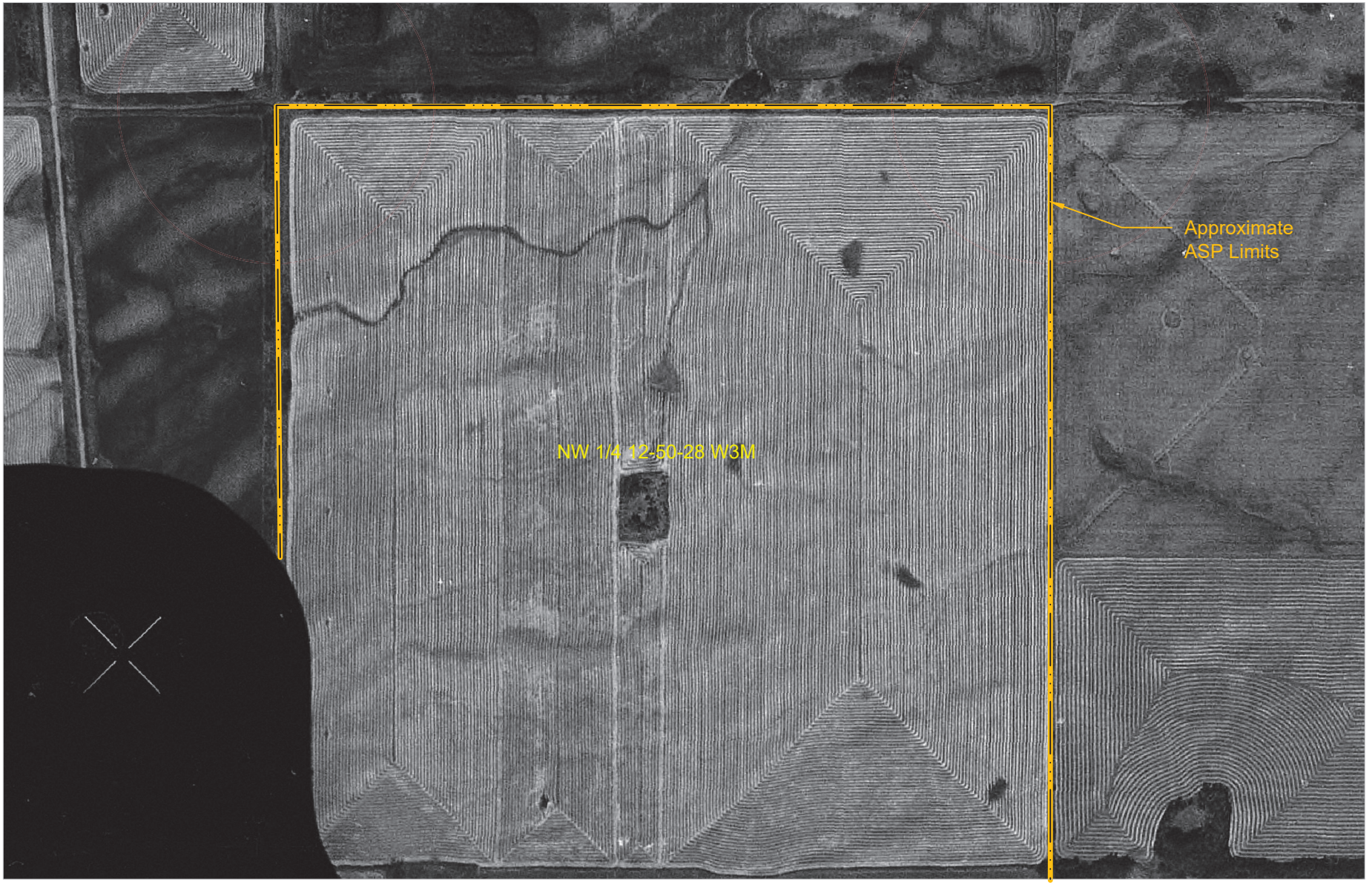
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DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6				DRAWING TITLE: Approximate Site Location Shown on a 2001 Aerial Photograph	



SCALE: NTS	DRAWN BY: AK	FIGURE No.: 7	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Site Location Shown on a 1988 Aerial Photograph	



SCALE: NTS	DRAWN BY: AK	FIGURE No.: 5	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskacthewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Site Location Shown on a 1975 Aerial Photograph	



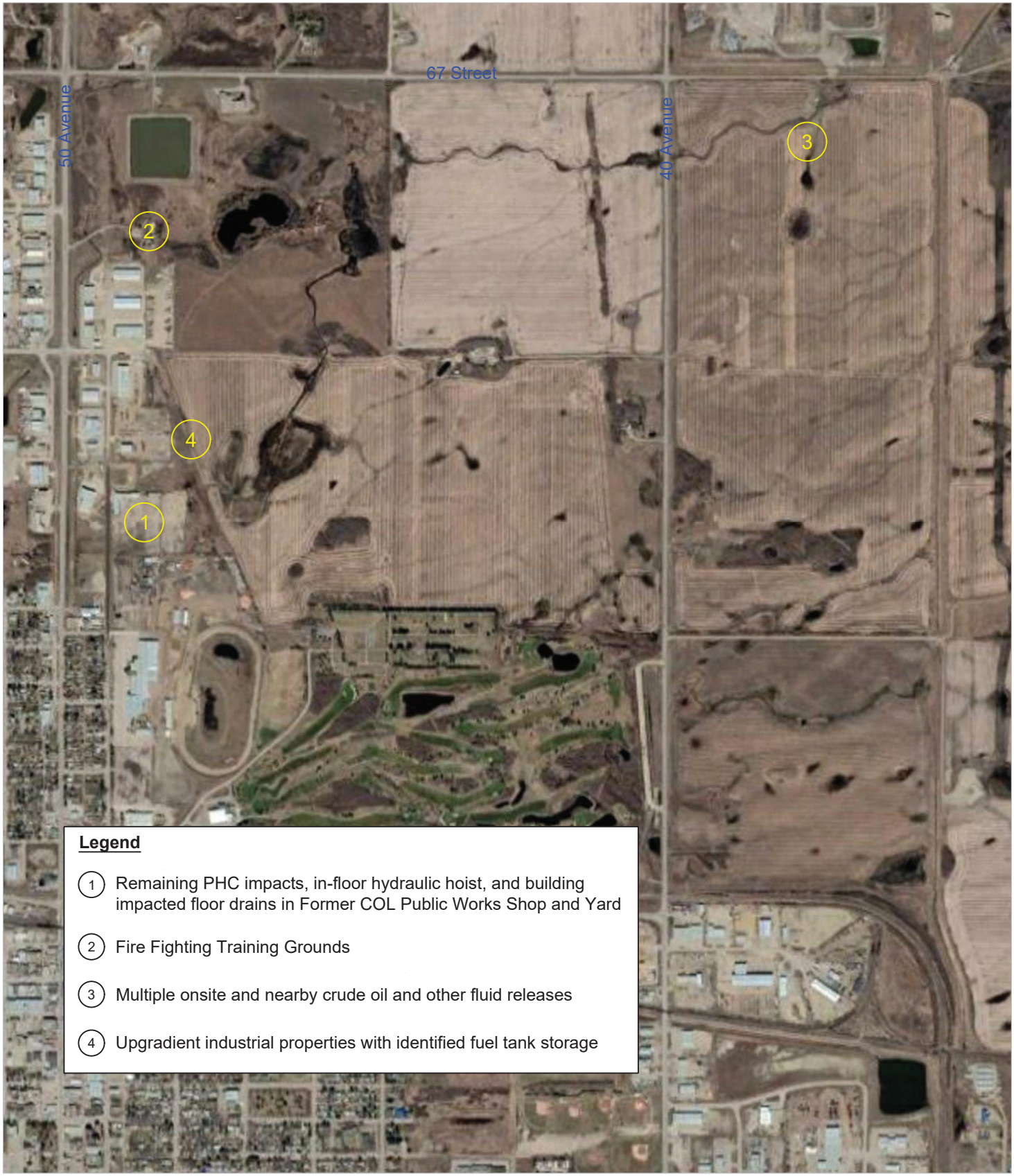
SCALE: NTS	DRAWN BY: AK	FIGURE No.: 6	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Site Location Shown on a 1965 Aerial Photograph	



SCALE: NTS	DRAWN BY: AK	FIGURE No.: 7	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Site Location Shown on a 1956 Aerial Photograph	



SCALE: NTS	DRAWN BY: AK	FIGURE No.: 8	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Site Location Shown on a 1950 Aerial Photograph	



Legend

1. Remaining PHC impacts, in-floor hydraulic hoist, and building impacted floor drains in Former COL Public Works Shop and Yard
2. Fire Fighting Training Grounds
3. Multiple onsite and nearby crude oil and other fluid releases
4. Upgradient industrial properties with identified fuel tank storage

SCALE: NTS	DRAWN BY: AK	FIGURE No.: 9	REVISION No.: 0	PROJECT NAME: Phase I Environmental Site Assessment Northeast Area Structure Plan Lloydminster, Saskatchewan	CLIENT: LLOYDMINSTER
DATUM: XXX	DATE: July 2020	PROJECT No.: PG20-1519.2000			
SolidEarth Geotechnical Inc. #105, 4604 50 Street, Cold Lake, AB, T9M 1S6	SolidEarth GEOTECHNICAL			DRAWING TITLE: Approximate Locations of Areas of Potential Concern Shown on a 2020 Aerial Photograph	

Appendix B

Historical Land Titles
Findings of Database Searches
Correspondence with Governmental Agencies

Appendix C1

Site Photographs Taken During the Site Visit - Former COL Public Works Shop and Yard



Photograph 1: Looking southeast toward the former COL Public Works Shop



Photograph 2: Looking south from central portion former COL Public Works Shop



Photograph 3: View of concrete floor in south garage bay at the former COL Public Works Shop



Photograph 4: Hydraulic lift located in the eastern wing of the shop building former COL Public Works Shop



Photograph 5: Sumps located in the eastern wash bay former COL Public Works Shop



Photograph 6: Drains located in the southern wing of the shop building



Photograph 7: Looking southeast towards former pump island in former COL Public Works Yard



Photograph 8: Looking north toward sheds located east of the shop building in the former COL Public Works Yard

Appendix C2

Site Photographs Taken During the Site Visit – Remaining Portions of the Site



Photograph 9: Looking north from south side of 5709 – 50 Avenue.



Photograph 10: Looking west toward former COL WTP building



Photograph 11: Looking northwest toward Kichton Contracting yard located to the west of the Site



Photograph 12: Looking east from western portion of LSD 5-11-50-28 W3M



Photograph 13: Looking south toward NW 12-50-12 W3M from 67 Street



Photograph 14: Looking south at drainage channel along eastern property boundary



Photograph 15: Looking northwest toward Site from eastern property boundary



Photograph 16: Husky Oil Operations Limited lease east of the Site



Photograph 17: Looking southeast at rail right-of-way located to the south of the Site