

Limited Phase II Environmental Site Assessment
Portion of 915 Ogilvie Boulevard NW
Portion of Plan 8520432 Block 111 Lot 41MR
Edmonton, Alberta

Prepared by

CRIMSON Environmental Limited

PO Box 24 - #314 – 222 Baseline Road

Sherwood Park, Alberta, T8H 1S8

Telephone: 780.719.4959

The Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice P008305

for

The City of Edmonton

Engineering Services Section

Integrated Infrastructure Services

Business Planning & Support Branch

11004 - 190 Street NW

Edmonton, Alberta

T5S 0G9

Project Number: CEL-37544A

April 20, 2021

EXECUTIVE SUMMARY

CRIMSON Environmental Limited (CRIMSON) was retained by the City of Edmonton to conduct a Limited Phase II Environmental Site Assessment (ESA) of a portion of the Ogilvie Ridge Park Site situated in the Ogilvie Ridge Neighbourhood. The municipal address for the subject property is 915 Ogilvie Boulevard NW, Edmonton, Alberta and the legal description for the subject site is a portion of Plan 8520432, Block 111, Lot 41MR (Figures 1 and 2). This report summarizes the scope of work, methodology and findings of the investigation.

The purpose of the investigation was to obtain soil quality data with respect to a select list of petroleum hydrocarbon (PHC) constituents, Alberta Tier I trace metals and/or salinity related parameters. The assessment was completed specifically to ascertain the soil quality of fill materials that were placed on to the property during development. Additional samples collected from the westernmost boreholes completed near the EPCOR Petrolia Substation were also analysed for a sterilants.

The intrusive portion of this investigation was completed on April 8, 2021. A total of nine boreholes were drilled using a track mounted drill rig operated by Landmark Drilling Services Ltd. The rig was equipped with solid stem augers. All of the boreholes were drilled to an approximate depth of 3.8 mbgl and were backfilled with bentonite and drill cuttings upon completion. Soil samples were transported to the Element Materials Technology Canada Inc. Laboratory in Edmonton with the appropriate chain-of-custody information. Soil samples were analysed for refined petroleum hydrocarbon constituents, Alberta Tier 1 trace metals, salinity related parameters and/or sterilants.

The results of the analytical testing obtained for all of the samples submitted to the laboratory during this assessment are not indicative of any impact from refined petroleum hydrocarbons, Alberta Tier 1 trace metals, sterilants or salinity related parameters. Based on the results of the assessment, no further assessment or remediation of the on-site fill materials is recommended at this time.

Table of Contents

1.0 INTRODUCTION.....	1
2.0 SITE DESCRIPTION.....	2
3.0 REGULATORY GUIDELINES.....	3
4.0 METHODOLOGY.....	4
5.0 RESULTS OF THE INVESTIGATION.....	4
6.0 CONCLUSIONS & RECOMMENDATIONS.....	6
7.0 QUALIFICATIONS OF THE ASSESSOR.....	7
8.0 REFERENCES.....	7
9.0 STATEMENT OF LIMITATIONS.....	8
10.0 CLOSURE.....	9

LIST OF FIGURES, TABLES AND APPENDICES

Figures

Figure 1 – Site Location Plan

Figure 2 – Site Survey Plan

Figure 3 – Site Zoning Plan

Figure 4 – Borehole Location Plan

Tables

Table 1 – Grain Size Data

Table 2 – Surface Soil Analytical Chemistry - Refined Petroleum Hydrocarbon Constituents

Table 3 – Subsoil Analytical Chemistry - Refined Petroleum Hydrocarbon Constituents

Table 4 – Soil Analytical Chemistry - Alberta Tier I Trace Metals

Table 5 – Subsoil Analytical Chemistry - Salinity Related Parameters

Table 6 – Soil Analytical Chemistry – Sterilant Scan

Appendices

Appendix A – Figures

Appendix B – Tables

Appendix C – Borehole Logs

Appendix D – Laboratory Reports

1.0 INTRODUCTION

CRIMSON Environmental Limited (CRIMSON) was retained by the City of Edmonton to conduct a Limited Phase II Environmental Site Assessment (ESA) of a portion of the Ogilvie Ridge Park Site situated in the Ogilvie Ridge Neighbourhood. The municipal address for the subject property is 915 Ogilvie Boulevard NW, Edmonton, Alberta and the legal description for the subject site is a portion of Plan 8520432, Block 111, Lot 41MR (Figures 1 and 2). This report summarizes the scope of work, methodology and findings of the investigation.

The purpose of the investigation was to obtain soil quality data with respect to a select list of petroleum hydrocarbon (PHC) constituents, Alberta Tier I trace metals and/or salinity related parameters. The assessment was completed specifically to ascertain the soil quality of fill materials that were placed on to the property during development. Additional samples collected from the westernmost boreholes completed near the EPCOR Petrolia Substation were also analysed for a sterilants.

1.1 Scope of Work

The final scope of work included the following tasks:

- Observe the drilling of nine boreholes at the locations provided on Figure 4. All of the boreholes were drilled to an approximate depth of 3.8 metres below ground level (mbgl);
- Complete a soil-sampling program for the purpose of quantifying potential impacts. This included the collection of soil samples at a regular interval of approximately 0.75 metres or as deemed necessary by field staff. Final collection depths were determined in the field and were dependent upon field conditions;
- Complete combustible vapour screening of all soil samples collected during the investigation;
- Submit select soil samples to an accredited laboratory for chemical analysis; and
- Prepare a report documenting the findings of the investigation.

Authorization to complete the assessment was obtained from the client and from the property owner prior to commencement.

1.2 Methodology

This investigation was completed following the recommended procedures outlined in the Canadian Standards Association (CSA) Publication Z769-00 Phase II Environmental Site Assessment and the Alberta Environmental Site Assessment Standard (2016) provided by Alberta Environment and Parks (AEP). These documents are considered to be the standards for Phase II ESAs in Alberta and it is CRIMSON's experience that investigations completed in accordance with these documents are generally acceptable to AEP as well as major financial institutions. It should be noted that this investigation was limited to an assessment of soil quality and was not intended to meet all of the requirements of a Phase II ESA.

The field portion of the investigation was completed on April 8, 2021. The information contained in this report, including all conclusions and recommendations, is subject to the limitations presented in Section 9.

2.0 SITE DESCRIPTION

The subject site (also referred to as the subject property) includes the southern portion of a single parcel of land situated in the city's Ogilvie Ridge Neighbourhood. The parcel is part of the existing Ogilvie Ridge Park site and is utilized as a recreational sports field. The municipal address for the subject property is 915 Ogilvie Boulevard NW, Edmonton, Alberta and the legal description for the subject site is a portion of Plan 8520432, Block 111, Lot 41MR (Figures 1 and 2).

With respect to adjacent properties, the site is surrounded by a mix of parkland, residential and/or industrial properties. The EPCOR Petrolia Substation is situated immediately west of the study area. A gravel access road to the EPCOR Petrolia Substation is present immediately south of the subject site followed by an electrical transmission right-of-way, residential properties and a pond. Private residences are situated immediately east of the subject property across Ogilvie Boulevard and the remaining portions of the Ogilvie Ridge Park are situated immediately north of the subject property. A site plan including adjacent land uses is provided on Figure 4 (Appendix A).

The topography of the subject property is generally flat with small undulations present on the eastern and northern portions of the site.

The closest water body to the site is the Whitemud Creek which is located approximately 300 metres northeast of the subject property at its nearest point. However, it should be noted that a tributary to the Whitemud Creek was previously present northwest of the subject site and was backfilled at the time of that site's development. The remaining portions of the tributary are situated approximately 150 metres northwest of the subject site across Ogilvie Boulevard NW.

The subject property and the additional portions of the park site which are located at 915 Ogilvie Boulevard NW are zoned US (Urban Services Zone). The remaining portions of the Ogilvie Ridge Park site situated at 951 Ogilvie Boulevard NW are zoned AP (Public Parks Zone). The adjacent EPCOR Petrolia Substation is zoned PU (Public Utility Zone) and the electrical power right-of-way is zoned AG (Agricultural Zone). The private residences situated east of the subject property are zoned RF1 (Single Detached Residential Zone). The on-site and surrounding land-use zonings are provided in Figure 3 (Appendix A).

2.1 Geology

As indicated by Kathol and McPherson (1975), the surficial geology in the general area of the subject property is reported to be comprised of glacio-lacustrine deposits. These deposits are reported to consist of clay, silt and sand with minor gravel. Alluvial deposits and erosional features are also reported to be present in the general area of the subject site.

The upper bedrock underlying the subject property is reported to be the Cretaceous aged Horseshoe Canyon Formation (also known as the Edmonton Formation). The bedrock is reported to be comprised of highly variable layers of sandstone, siltstone and mudstone as well as laterally continuous coal deposited in a non-marine to marginal marine environment (AGS, 2013).

3.0 REGULATORY GUIDELINES

The Alberta Tier 1 Soil and Groundwater Remediation Guidelines, (2019) provided by AEP are considered to be the applicable regulatory guidelines to determine impacts from refined petroleum hydrocarbons, sterilants and/or trace metals in soil. This document summarizes the regulatory requirements in Alberta and provides a site management process for soil and groundwater contamination. Based on the current, on-site land use, the Tier 1 Guidelines for residential and/or parkland land uses have been applied to the entire site. The commercial and/or industrial guidelines have also been applied to the western portion of the subject site that is situated within 30 metres of the EPCOR Petrolia Substation. Based on the results of this assessment, the lowest guideline for either coarse grained or fine-grained sediments has been provided for assessment purposes. This is considered to be a conservative measure and is based on the limited amount of site specific geological data that is available at the time of publication. It should, however, be noted that the underlying, native clay observed during the assessment was found to be fine-grained in nature.

With regards to salinity related parameters, the Alberta Tier 1 Salt Remediation Guidelines provided in the Alberta Tier 1 Soil and Groundwater Remediation Guidelines, (2019) are considered to be the applicable regulatory guidelines. Based on the location of the analysed soil samples, the guidelines for subsoil have been used for assessment purposes.

4.0 METHODOLOGY

4.1 Intrusive Investigation

The intrusive portion of this investigation was completed on April 8, 2021. A total of nine boreholes were drilled using a track mounted drill rig operated by Landmark Drilling Services Ltd. The rig was equipped with solid stem augers. All of the boreholes were drilled to an approximate depth of 3.8 mbgl and were backfilled with bentonite and drill cuttings upon completion. The completion locations of all boreholes are provided on Figure 4 in Appendix A and borehole logs are provided in Appendix C.

4.2 Soil Sampling

A total of forty eight soil samples were collected during this assessment. Duplicate samples were collected at all borehole locations at the depth intervals indicated on the borehole logs (Appendix C). At each sampling point, one portion of the soil sample for each depth interval was placed directly into a clearly labeled polyethylene bag for combustible vapour screening and/or analytical purposes (inorganic parameters only). The second portion of the soil sample at each depth interval was placed into clearly labeled, laboratory prepared, 125 millilitre glass jars complete with Teflon-lined plastic lids. In addition, approximately 5 milligrams of soil was inserted directly into each of two laboratory prepared vials filled with approximately 5 millilitres of methanol. Sampling gloves were changed prior to the collection of every soil sample. Soil samples were transported to the Element Materials Technology Canada Inc. Laboratory in Edmonton with the appropriate chain-of-custody information. All soil samples were transported in chilled coolers.

5.0 RESULTS OF THE INVESTIGATION

5.1 Stratigraphy

The soil profile observed during this investigation included varying thicknesses of fill materials including silt, sand, organics, gravel and clay. The fill materials were underlain by clay. Detailed descriptions are provided on the borehole logs in Appendix C.

5.2 Grain-size Analyses

Seven soil samples were submitted for grain size analyses during this assessment. The samples which were collected at an approximate depth of 3.8 mbgl are interpreted to be undisturbed, native soil. The results indicate that the underlying surficial clay is predominantly classified as fine-grained under the Alberta Tier 1 Guidelines. The results are provided on Table 1 in Appendix A and copy of the laboratory report is provided in Appendix D.

5.3 Chemical Analyses

The results of chemical analyses completed on the soil samples collected during this investigation are provided on Tables 2 - 6 in Appendix B. A copy of the laboratory report is provided in Appendix D. The results are summarized in the following subsections. With respect to analytical samples, selection was based upon the location of the borehole, geology, on-site observations, field screening results and professional judgment.

5.3.1 Refined Petroleum Hydrocarbons – Surface Soil

Eleven surface soil samples (collection depth ≤ 3.0 mbgl) and one subsoil sample (collection depth > 3.0 mbgl) were submitted for chemical analyses of a select list of refined petroleum hydrocarbon constituents. This includes analyses for benzene, toluene, ethylbenzene, total xylenes (BTEX) and petroleum hydrocarbon (PHC) fractions one through four (F1-F4). The results of the analyses are provided on Tables 2 and 3 (Appendix B) and indicated that the concentrations of all analysed parameters were below their respective, applicable Alberta Tier 1 Guidelines.

5.3.2 Alberta Tier 1 Trace Metals

Twelve soil samples were submitted for chemical analyses of a select list of Alberta Tier 1 trace metals. The results of the analyses are provided on Table 4 (Appendix B) and indicate that the concentrations of the analysed parameters were below their respective, applicable Alberta Tier 1 Guidelines.

5.3.3 Salinity Related Parameters

Twelve soil samples were submitted for chemical analyses of a select list of salinity related parameters during this investigation. The results of the analyses are provided on Table 5 in Appendix B and are summarized as follows:

- The soluble conductivity values of all of the submitted samples were below 3 dS/m. All of the samples are classified as “Good” under the Alberta Tier 1 Salt Remediation Guidelines;
- The sodium adsorption ratios (SAR) values of all of the submitted samples were below 4. All of the samples are classified as “Good” under the Alberta Tier 1 Salt Remediation Guidelines;
- The pH values reported for all of the samples were within the acceptable range of 6.0 to 8.5 that is specified in the Alberta Tier 1 Guidelines for residential, parkland commercial and/or industrial land uses.

5.3.4 Sterilant Scan

Four soil samples collected from boreholes situated east of the EPCOR Petrolia Substation were submitted for chemical analyses of a select list of sterilants. The results of the analyses are provided on Table 6 (Appendix B) and indicate that the concentrations of the analysed parameters were below their respective detection limits and their respective, applicable Alberta Tier 1 Guidelines (if any).

6.0 CONCLUSIONS & RECOMMENDATIONS

The results of the analytical testing obtained for all of the samples submitted to the laboratory during this assessment are not indicative of any impact from refined petroleum hydrocarbons, Alberta Tier 1 trace metals, sterilants or salinity related parameters. Based on the results of the assessment, no further assessment or remediation of the on-site fill materials is recommended at this time.

7.0 QUALIFICATIONS OF THE ASSESSOR

This report was completed by Mr. Douglas Pankewich of CRIMSON Environmental Limited. Mr. Pankewich has over twenty five years of professional and project management experience as an environmental geologist in both the private and public sectors. He has worked on over 500 projects including Phase I, II, and III ESAs, contaminant delineation investigations, hydrogeological investigations and remediation projects for both soil and groundwater. Mr. Pankewich is a graduate of Laval University and the University of Québec at the National Institute for Scientific Research. He holds undergraduate degrees in Geology and Geological Engineering as well as a Master of Sciences degree in Earth Sciences.

8.0 REFERENCES

1. Alberta Environment and Parks. *Alberta Environmental Site Assessment Standard*, 2016;
2. Alberta Geological Survey. Map 600. *Bedrock Geology Map of Alberta*. Edmonton, Alberta. March, 2013;
3. City of Edmonton. *Environmental Site Assessment Guidebook*. Edmonton, Alberta. March, 2016;
4. CRIMSON Environmental Limited. *Phase I Environmental Site Assessment 915 Ogilvie Boulevard NW & 951 Ogilvie Boulevard N, Plan 8520432 Block 111 Lot 41MR, Plan 8521132 Block 111 Lot 69MR, Plan 8921159 Block 111 Lot 70MR, Edmonton, Alberta*. Project Number: CEL-37544A. February 27, 2021;
5. CSA International Standard Z768-01. *Phase I Environmental Site Assessment*. Toronto, Ontario. 2016; and
6. Kathol and McPherson. *Urban Geology of Edmonton*. Alberta Research Council. Bulletin 32. Edmonton, Alberta. 1975.

9.0 STATEMENT OF LIMITATIONS

Subject to the following conditions and limitations, the investigation described in this report has been conducted in a manner consistent with a reasonable level of care and skill normally exercised by members of the health, safety and environmental consulting profession currently practicing under similar conditions in the area:

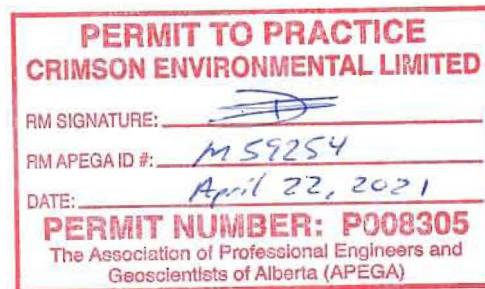
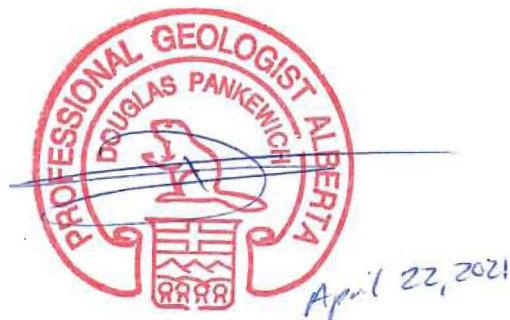
1. This report has been prepared for the exclusive use of the City of Edmonton. The report is intended to provide an assessment of known or potential environmental concerns and liabilities associated with past and current practices of the subject property;
2. The report is based on data and information collected from available records, personal interviews and a site investigation conducted by CRIMSON personnel. CRIMSON has relied in good faith on information provided by individuals and sources noted in this report. We accept no responsibility for any deficiency, misstatements, or inaccuracy contained in this report as a result of omissions, misstatements, or fraudulent acts of persons interviewed;
3. The site investigation is based solely on the site conditions at the site at the time of the field investigation as described in this report;
4. The service provided by CRIMSON in completing the investigation is intended to assist the Client with a business decision. The liability of this site is not transferred to CRIMSON as a result of such services, and CRIMSON does not make recommendations regarding the purchase, sale or investment of the property;
5. The scope of the investigation described in this report has been limited by the budget set for the investigation in our contract. The scope of the investigation has been reasonable having regard to that budget constraint;
6. The investigation described in this report has relied upon information provided by third parties concerning the history of the site. Except as stated in this report, we have not made an independent verification of such historical information;
7. The investigation described in this report has been made in the context of existing government regulations generally promulgated at the date of this report. The investigation did not take account of any government regulations not in effect or not generally promulgated at the date of this report;
8. Where indicated or implied in this report, or where mandated by the condition of the site and its attendant structures, the conclusions of this report are based on visual observation of the site and a limited amount of sampling. The conclusions of this report do not apply to any areas of the site not available for inspection or areas not sampled;
9. The investigation was limited in scope. As such, the potential remains for the presence of unknown, unidentified, or unforeseen surface or subsurface contamination. If further evidence suggests potential contamination, a follow-up investigation including sampling and analysis would be recommended; and
10. This report is intended for the exclusive use of the company, organization or individual to whom it is addressed. It may not be used or relied upon in any manner whatsoever, or for any purpose whatsoever, by any other party. The Consultant makes no representation of fact or opinion of any nature whatsoever to any person or entity other than the company, organization or individual to whom this report is addressed.

10.0 CLOSURE

We trust that this report meets with your current requirements. Should you have any questions or concerns please do not hesitate to contact the undersigned.

Respectfully Submitted,

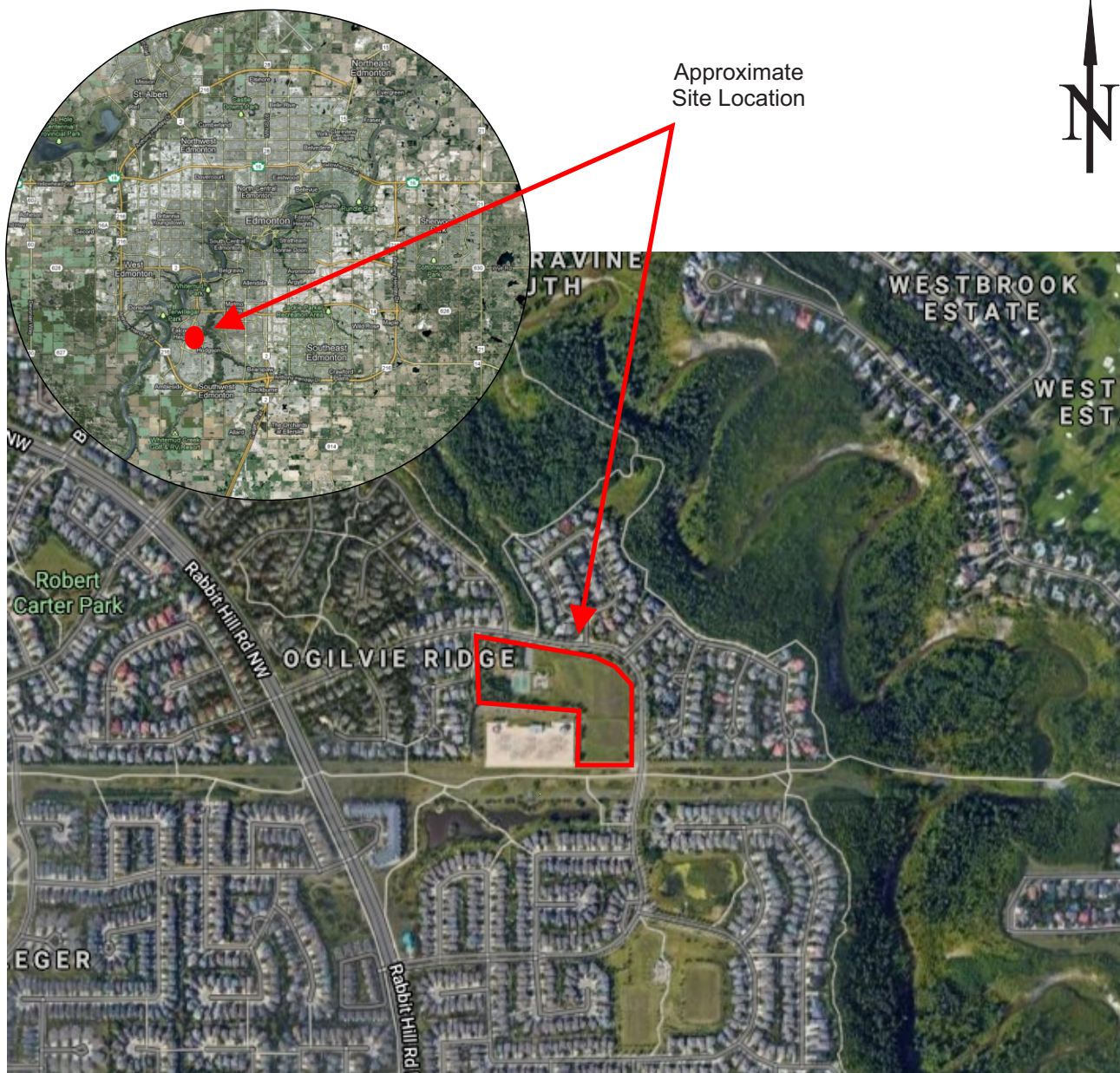
CRIMSON Environmental Limited



Douglas Pankewich, M.Sc., P.Geol., P.Eng.
Geological Engineer

Appendix A

Figures



Scale
200 metres

Reference: Goggle, 2021.

*Scale provided is approximate.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Location Plan

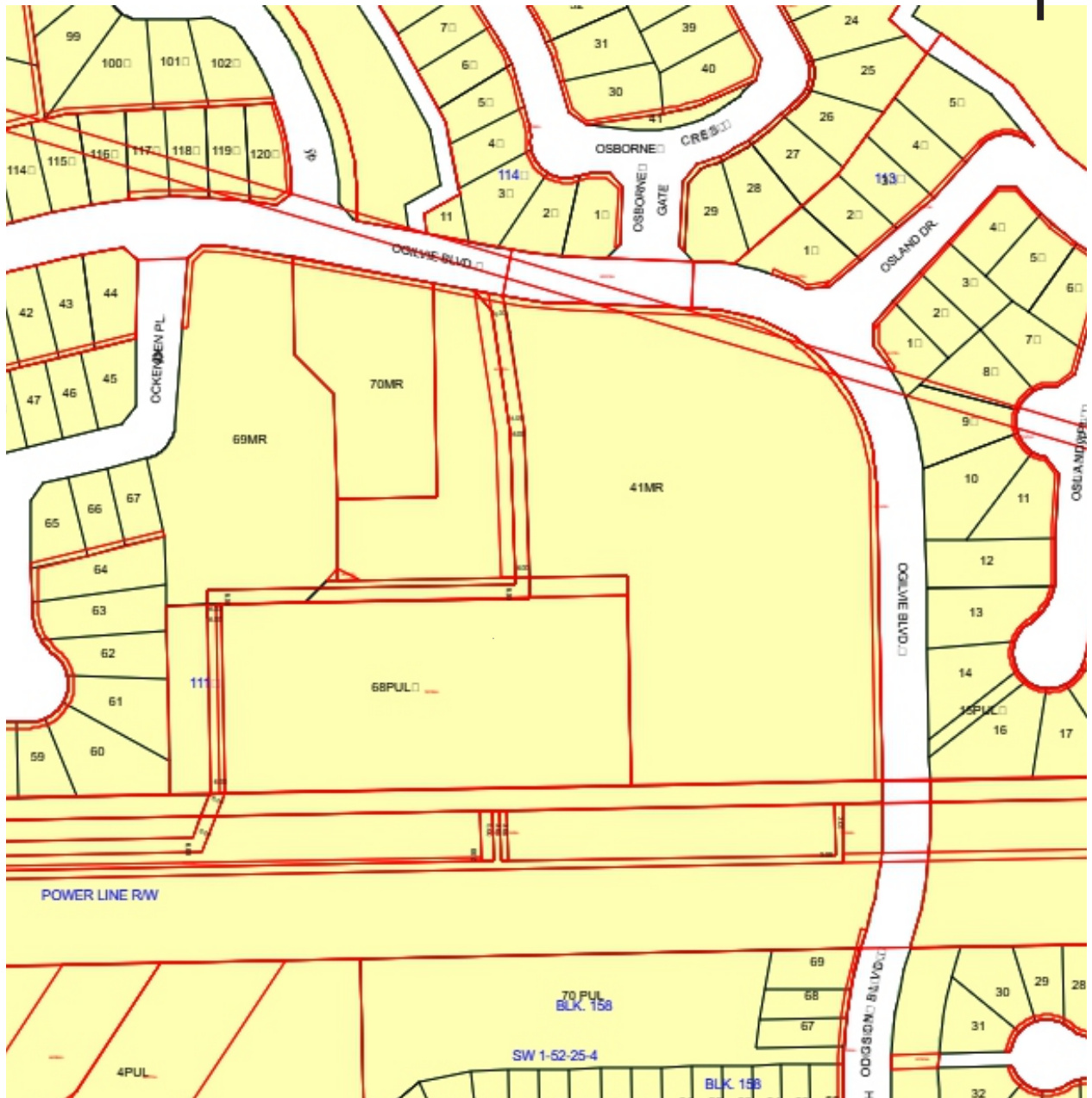
Figure 1

Scale: As Shown

915 Ogilvie Boulevard NW &
951 Ogilvie Boulevard NW
Edmonton, Alberta

February, 2021

CEL-37544A



Scale
100 metres

Reference: Government of Alberta, 2021.

*Scale provided is nominal. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Survey Plan

915 Ogilvie Boulevard NW &
951 Ogilvie Boulevard NW
Edmonton, Alberta

Figure 2

Scale: As Shown

February, 2021

CEL-37544A



Legend

A = Metropolitan Recreation Zone
AG = Agricultural Zone
AP = Public Parks Zone
PU = Public Utility Zone
RF1 = Single Detached Residential Zone
US = Urban Services Zone

Reference: The City of Edmonton, 2021.

*Scale provided is nominal. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Zoning Plan

915 Ogilvie Boulevard NW &
951 Ogilvie Boulevard NW
Edmonton, Alberta

Figure 3

Scale: As Shown

February, 2021

CEL-37544A



Scale
25 metres

Legend

● Approximate Borehole Location

Reference: City of Edmonton, 2021.

*Scale provided is approximate.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Borehole Location Plan

915 Ogilvie Boulevard NW &
951 Ogilvie Boulevard NW
Edmonton, Alberta

Figure 4

Scale: As Shown

April, 2021

CEL-37544A

Appendix B

Tables

Table 2. Surface Soil Analytical Chemistry - Refined Petroleum Hydrocarbon Constituents

Parameter	Sample - Analytical Results											Regulatory Guideline ²	
	21-01 @ 2.3 m	21-02 @ 1.5 m	21-03 @ 1.5 m	21-04 @ 1.5 m	21-05 @ 1.5 m	21-05 @ 3.0 m	21-06 @ 1.5 m	21-07 @ 2.3 m	21-08 @ 1.5 m	21-08 @ 3.0 m	21-09 @ 1.5 m	Residential / Parkland Land Uses	Commercial and/or Industrial Land Uses
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.046	0.046
Toluene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.12	0.12
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.073	0.073
Total Xylenes	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.99	0.99
CWS Fraction 1 - BTEX	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	24	270
CWS Fraction 2 (C10-16)	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	130	260
CWS Fraction 3 (C16-34)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	300	1,700
CW S Fraction 4 (C34-50)	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	2,800	3,300
CW S Fraction 4G (C34-50)	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	2,800	3,300

Notes:

1. All values expressed as parts-per-million (ppm);
2. *Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019.* Lowest guidelines for coarse and/or fine grained soil provided; and
3. Values (if any) which exceed the applicable Alberta Tier 1 Guideline are highlighted.

Table 3. Surface Soil Analytical Chemistry - Refined Petroleum Hydrocarbon Constituents

Parameter	Sample - Analytical Results	Regulatory Guideline ²	
	21-02 @ 3.8 m	Residential / Parkland Land Uses	Commercial and/or Industrial Land Uses
Benzene	<0.005	0.046	0.046
Toluene	<0.02	0.12	0.12
Ethylbenzene	<0.005	0.073	0.073
Total Xylenes	<0.03	0.99	0.99
CWS Fraction 1 - BTEX	<10	30	440
CWS Fraction 2 (C10-16)	<25	160	520
CWS Fraction 3 (C16-34)	<50	600	3,400
CW S Fraction 4 (C34-50)	<100	5,600	6,600
CW S Fraction 4G (C34-50)	<100	5,600	6,600

Notes:

1. All values expressed as parts-per-million (ppm);
2. *Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019*. Lowest guidelines for coarse and/or fine grained soil provided; and
3. Values (if any) which exceed the applicable Alberta Tier 1 Guideline are highlighted.

Table 4. Soil Analytical Chemistry - Alberta Tier I Trace Metals

Parameter	Sample - Analytical Results												Regulatory Guideline ²		
	21-01 @ 2.3 m	21-02 @ 1.5 m	21-02 @ 3.8 m	21-03 @ 1.5 m	21-04 @ 1.5 m	21-05 @ 1.5 m	21-05 @ 3.0 m	21-06 @ 1.5 m	21-07 @ 2.3 m	21-08 @ 1.5 m	21-08 @ 3.0 m	21-09 @ 1.5 m	Residential / Parkland Land Uses	Commercial Land Uses	Industrial Land Uses
Total Antimony (Sb)	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	20	40	40
Total Arsenic (As)	9.4	9.5	8.4	9.2	9.0	7.7	9.9	8.8	8.5	8.6	8.2	8.5	17	26	26
Total Barium (Ba)	223	199	153	190	182	153	204	185	203	176	150	198	500	2,000	2,000
Total Beryllium (Be)	0.6	0.7	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.6	5	8	8
Boron (B), Sat. Paste Ext.	0.08	0.06	0.07	0.08	0.07	0.09	0.09	0.09	0.1	0.14	0.15	0.09	3.3	5.0	5.0
Total Cadmium (Cd)	0.24	0.22	0.21	0.25	0.17	0.12	0.26	0.18	0.27	0.29	0.24	0.22	10	22	22
Total Chromium (Cr)	22.7	21.2	17.6	23	25.7	21.6	23.9	20.8	18.4	17.9	10.6	20	64	87	87
Hex. Chromium (Cr 6+)	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.4	1.4	1.4
Total Cobalt (Co)	9.8	9.9	8.4	9.8	9.6	9.0	10.8	9.8	8.9	8.8	7.4	9.2	20	300	300
Total Copper (Cu)	22.3	24.5	18.7	23	21.2	19.5	23.7	22.7	19.6	20.6	15.1	19.7	63	91	91
Total Lead (Pb)	11.4	11.5	9.0	10.9	10.6	9.2	11.2	10.5	9.7	9.6	8.0	9.7	140	260	600
Total Mercury (Hg)	0.06	0.05	0.06	0.06	0.06	<0.05	0.06	<0.05	0.06	<0.05	<0.05	<0.05	6.6	24	50
Total Molybdenum (Mo)	1.1	1.0	<1.0	1.1	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	4	40	40
Total Nickel (Ni)	32	28.9	23.9	30	34	28	33.8	27.9	25.7	26.5	19.5	27.1	45	89	89
Total Selenium (Se)	0.4	0.3	0.3	0.3	0.4	<0.3	0.4	<0.3	0.3	0.4	0.4	0.3	1	2.9	2.9
Total Silver (Ag)	<0.10	0.1	<0.10	<0.10	0.1	<0.10	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	20	40	40
Total Thallium (Tl)	0.24	0.2	0.17	0.21	0.19	0.18	0.24	0.18	0.2	0.21	0.17	0.19	1	1	1
Total Tin (Sn)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5	300	300
Total Uranium (U)	0.8	0.8	0.9	0.8	0.7	0.7	0.8	0.8	0.9	1.0	1.2	0.7	23	33	300
Total Vanadium (V)	27.2	28.8	20.4	28.4	29.2	28.8	29.3	29.9	23.3	22.9	17.8	26.4	130	130	130
Total Zinc (Zn)	76	79	65	77	72	62	77	71	66	68	60	68	250	410	410

Notes:

1. All values expressed as parts-per-million (ppm). Mg/kg for all analyses except boron by sat. paste which is expressed as mg/L;
2. Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019;
3. -- = Sample not analysed for this parameter;
4. NG = No guideline provided by AEP; and
5. Values (if any) which exceed the applicable Alberta Tier 1 Guideline are highlighted. Orange Highlight is solely due to detection limit.

Table 5. Subsoil Analytical Chemistry - Salinity Related Parameters

Analytical Parameter	Units	Samples - Analytical Results												Regulatory Guidelines				
		21-01 @ 2.3 m	21-02 @ 1.5 m	21-02 @ 3.8 m	21-03 @ 1.5 m	21-04 @ 1.5 m	21-05 @ 1.5 m	21-05 @ 3.0 m	21-06 @ 1.5 m	21-07 @ 2.3 m	21-08 @ 1.5 m	21-08 @ 3.0 m	21-09 @ 1.5 m	Alberta Tier 1 Salt Remediation Guidelines for Subsoil ¹				Alberta Tier 1 Guidelines ²
		Good	Fair	Poor	Unsuitable													
Soluble Conductivity (Sat. Paste)	dS/m	0.49	0.45	0.28	0.45	0.51	0.42	1.11	0.36	0.31	0.5	0.54	0.47	<3	3 - 5	5 - 10	>10	4
Sodium Adsorption Ratio	N/A	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.4	0.3	<4	4 - 8	8 - 12	>12	12
% Saturation	%	62	70	48	64	64	67	65	72	56	58	46	57	--	--	--	--	--
Calcium	mg/kg	46.1	46.1	17.3	41.4	50.3	38.8	115	40	21.5	28.1	31	37.8	--	--	--	--	--
Magnesium	mg/kg	9.8	10.5	4.9	10.1	10.8	9.3	27.8	8.6	8.3	12.9	9.2	9.8	--	--	--	--	--
Sodium	mg/kg	7	6	3	6	6	5	15	6	6	10	6	6	--	--	--	--	--
Potassium	mg/kg	4	4	3	4	4	4	6	4	3	5	4	3	--	--	--	--	--
Chloride	mg/L	9	7	5	6	13	10	15	9	7	25	64	39	--	--	--	--	--
Chloride	mg/kg	6	5	2	4	9	7	10	6	4	14	29	23	--	--	--	--	--
Sulfate (SO4)	mg/kg	91.1	94.6	19.2	85.8	81.3	53.7	365	56.7	29.4	61.4	39.1	49.4	--	--	--	--	--
TGR	T/ac	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	--	--	--	--
Soluble (CaCl2) pH	pH	7.4	7.6	7.5	7.5	7.2	7.2	7.7	7.6	7.8	7.4	7.5	7.6	--	--	--	--	6.0 to 8.5

Notes:

1. AEP. *Alberta Tier 1 Salt Remediation Guidelines, 2019*. Guideline for topsoil or subsoil provided as indicated;
 2. Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019. Residential, parkland, commercial and/or industrial land uses; and
3. -- = No Standard Provided by AEP.

Table 6. Soil Analytical Chemistry - Sterilant Scan

Parameter	Sample - Analytical Results				Regulatory Guideline ²	
	21-01 @ Surface	21-02 @ Surface	@ 1.5 m	21-03 @ Surface	Residential / Parkland Land Uses	Commercial and/or Industrial Land Uses
Atrazine	<0.005	<0.005	<0.005	<0.005	0.0088	0.0088
Bromacil	<0.008	<0.008	<0.008	<0.008	0.009	0.009
Chlorotoluron	<0.02	<0.02	<0.02	<0.02	NG	NG
Cyanazine	<0.02	<0.02	<0.02	<0.02	0.12	0.12
Diuron	<0.02	<0.02	<0.02	<0.02	1.9	1.9
Fenuron	<0.02	<0.02	<0.02	<0.02	NG	NG
Isoproturon	<0.02	<0.02	<0.02	<0.02	NG	NG
Linuron	<0.02	<0.02	<0.02	<0.02	0.051	0.051
Metoxuron	<0.02	<0.02	<0.02	<0.02	NG	NG
Monolinuron	<0.02	<0.02	<0.02	<0.02	NG	NG
Simazine	<0.02	<0.02	<0.02	<0.02	0.033	0.033
Tebuthiuron	<0.005	<0.005	<0.005	<0.005	0.046	0.60

Notes:

1. All values expressed as parts-per-million (ppm);
2. *Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019*. Lowest guidelines for coarse and/or fine grained soil provided;
3. Values (if any) which exceed the applicable Alberta Tier 1 Guideline are highlighted; and
4. NG = No guideline provided by AEP.

Appendix C

Borehole Logs

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-01		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND	

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0			TOPSOIL with vegetation at surface.		1					
			FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.		2	⊗				< 25 ppm
					3	⊗				< 25 ppm
					4	⊗				< 25 ppm
					5	⊗				< 25 ppm
					6	⊗				< 25 ppm
4			End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite and capped with drill cuttings. All details provided on this borehole log are approximate.							
5										
6										
7										
8										

LOGGED BY: DP	COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP	COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich	Page 1 of 1

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-02		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE								
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND								

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000				COMMENTS	DEPTH (m)	
0			TOPSOIL with vegetation at surface.		1							
			FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.		2	⊗					< 25 ppm	1
1					3	⊗					< 25 ppm	
2					4	⊗					< 25 ppm	2
3					5	⊗					< 25 ppm	3
4			End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite and capped with drill cuttings. All details provided on this borehole log are approximate.		6	⊗					< 25 ppm	4
5												5
6												6
7												7
8												8

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-03		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE								
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND								

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000				COMMENTS	DEPTH (m)	
0			TOPSOIL with vegetation at surface.		1							
			FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.		2	⊗					< 25 ppm	1
					3	⊗					< 25 ppm	
					4	⊗					< 25 ppm	2
					5	⊗					< 25 ppm	3
					6	⊗					< 25 ppm	4
4			End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite and capped with drill cuttings. All details provided on this borehole log are approximate.									
5												5
6												6
7												7
8												8

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-04		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE			<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE
BACKFILL TYPE			<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0			TOPSOIL with vegetation at surface.							
1			FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.		1	⊗				< 25 ppm
2					2	⊗				< 25 ppm
3					3	⊗				< 25 ppm
4					4	⊗				< 25 ppm
5					5	⊗				< 25 ppm
6										
7										
8										

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

End of borehole at 3.8 metres below ground level.
Borehole backfilled with bentonite and capped with drill cuttings.
All details provided on this borehole log are approximate.

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-05		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE			<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE
BACKFILL TYPE			<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0			TOPSOIL with vegetation at surface.							
1			FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.		1	⊗				< 25 ppm
2					2	⊗				< 25 ppm
3					3	⊗				< 25 ppm
4					4	⊗				< 25 ppm
5					5	⊗				< 25 ppm
6										
7										
8										

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

End of borehole at 3.8 metres below ground level.
Borehole backfilled with bentonite and capped with drill cuttings.
All details provided on this borehole log are approximate.

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-06		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE	
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND	

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0			TOPSOIL with vegetation at surface. FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.							
1					1	⊗				< 25 ppm
2					2	⊗				< 25 ppm
3					3	⊗				< 25 ppm
4					4	⊗				< 25 ppm
5					5	⊗				< 25 ppm
6										
7										
8										

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-07		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE								
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND								

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000			COMMENTS	DEPTH (m)
0			TOPSOIL with vegetation at surface. FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.							
1					1	⊗				< 25 ppm
2					2	⊗				< 25 ppm
3					3	⊗				< 25 ppm
4					4	⊗				< 25 ppm
5					5	⊗				< 25 ppm
6										
7										
8										
			End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite and capped with drill cuttings. All details provided on this borehole log are approximate.							

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-08		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE			<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE
BACKFILL TYPE			<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Vapour Concentration (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0			TOPSOIL with vegetation at surface. FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.							
1					1				< 25 ppm	1
2					2				< 25 ppm	2
3					3				< 25 ppm	3
4					4				< 25 ppm	4
5					5				< 25 ppm	5
6										6
7										7
8										8

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

PROJECT: Limited Phase II ESA			CLIENT: City of Edmonton			TESTHOLE NO: 21-09		
LOCATION: Portion of 915 Ogilvie Boulevard NW, Edmonton, AB						PROJECT NO.: CEL-37544A		
CONTRACTOR: Landmark Drilling Services Ltd.			METHOD: Solid Stem			ELEVATION (m):		
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE								
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND								

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000			COMMENTS	DEPTH (m)
0			TOPSOIL with vegetation at surface. FILL, Clay, silty with trace fine-medium sand, trace fine-medium gravel, medium plastic, firm, brown, moist, trace coal, trace rootlets.							
1					1	⊗			< 25 ppm	1
2					2	⊗			< 25 ppm	2
3					3	⊗			< 25 ppm	3
4					4	⊗			< 25 ppm	4
5					5	⊗			< 25 ppm	5
6										6
7										7
8										8
			End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite and capped with drill cuttings. All details provided on this borehole log are approximate.							

LOGGED BY: DP		COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP		COMPLETION DATE: 4/8/21
PROJECT MANAGER: Pankewich		Page 1 of 1

Appendix D

Laboratory Reports

Report Transmission Cover Page

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Contact	Company	Address
Doug Pankewich	Crimson Environmental Ltd.	#24 -314 - 222 Baseline Road Sherwood Park, AB T8H 1S8 Phone: (780) 719-4959 Email: pankewich@shaw.ca

Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / COA
Email - Multiple Reports By Agreement	PDF	COC / Test Report
Email - Single Report	Legacy Crosstab in CSV	Test Report
Email - Single Report	PDF	Work Ticket

Notes To Clients:

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-1	1484640-4	1484640-5	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-01 @ Surface	21-02 @ Surface	21-02 / 1.5 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Sterilants in Soil						
Atrazine	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Bromacil	Dry Weight	mg/kg	<0.008	<0.008	<0.008	0.008
Chlorotoluron	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Cyanazine	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Diuron	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Fenuron	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Isoproturon	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Linuron	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Metoxuron	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Monolinuron	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Simazine	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Tebuthiuron	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Sterilants - Soil - Surrogate Recovery						
Monuron	Surrogate	%	75	79	87	50-140

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-2	1484640-5	1484640-6	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-01 / 2.3 / m	21-02 / 1.5 / m	21-02 / 3.8 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Boron	Saturated Paste	mg/L	0.08	0.06	0.07	0.05
Antimony	Strong Acid Extractable	mg/kg	0.5	0.5	0.5	0.2
Arsenic	Strong Acid Extractable	mg/kg	9.4	9.5	8.4	0.2
Barium	Strong Acid Extractable	mg/kg	223	199	153	1
Beryllium	Strong Acid Extractable	mg/kg	0.6	0.7	0.5	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.24	0.22	0.21	0.01
Chromium	Strong Acid Extractable	mg/kg	22.7	21.2	17.6	0.5
Cobalt	Strong Acid Extractable	mg/kg	9.8	9.9	8.4	0.1
Copper	Strong Acid Extractable	mg/kg	22.3	24.5	18.7	1
Lead	Strong Acid Extractable	mg/kg	11.4	11.5	9.0	0.1
Mercury	Strong Acid Extractable	mg/kg	0.06	0.05	0.06	0.05
Molybdenum	Strong Acid Extractable	mg/kg	1.1	1.0	<1.0	1
Nickel	Strong Acid Extractable	mg/kg	32.0	28.9	23.9	0.5
Selenium	Strong Acid Extractable	mg/kg	0.4	0.3	0.3	0.3
Silver	Strong Acid Extractable	mg/kg	<0.10	0.1	<0.10	0.1
Thallium	Strong Acid Extractable	mg/kg	0.24	0.20	0.17	0.05
Tin	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Uranium	Strong Acid Extractable	mg/kg	0.8	0.8	0.9	0.5
Vanadium	Strong Acid Extractable	mg/kg	27.2	28.8	20.4	0.1
Zinc	Strong Acid Extractable	mg/kg	76	79	65	1
Salinity						
Electrical Conductivity	Saturated Paste	dS/m	0.49	0.45	0.28	0.01
SAR	Saturated Paste		0.3	0.3	0.2	
% Saturation		%	62	70	48	
Calcium	Saturated Paste	mg/kg	46.1	46.1	17.3	
Magnesium	Saturated Paste	mg/kg	9.8	10.5	4.9	
Sodium	Saturated Paste	mg/kg	7	6	3	
Potassium	Saturated Paste	mg/kg	4	4	3	
Chloride	Saturated Paste	mg/L	9	7	5	2
Chloride	Saturated Paste	mg/kg	6	5	2	
Sulfate (SO4)	Saturated Paste	mg/kg	91.1	94.6	19.2	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
Soil Acidity						
pH	1:2 Soil:CaCl2 sol.	pH	7.4	7.6	7.5	
Water Soluble Parameters						
Chromium (VI)	Dry Weight	mg/kg	<0.05	<0.05	<0.05	0.05
Mono-Aromatic Hydrocarbons - Soil						
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-2	1484640-5	1484640-6	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-01 / 2.3 / m	21-02 / 1.5 / m	21-02 / 3.8 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Soil - Continued						
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Methanol Field Preservation			Yes	Yes	Yes	
Volatile Petroleum Hydrocarbons - Soil						
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		9-Apr-21	9-Apr-21	9-Apr-21	
F2c C10-C16	Dry Weight	mg/kg	<25	<25	<25	25
F3c C16-C34	Dry Weight	mg/kg	<50	<50	<50	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	<100	100
% C50+		%	<5	<5	<5	
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	17.70	18.30	18.80	

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Reference Number	1484640-3	1484640-9	1484640-12
Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021
Sample Time	NA	NA	NA
Sample Location			
Sample Description	21-01 / 3.8 / m	21-03 / 3.8 / m	21-05 / 3.0 / m
Matrix	Soil	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Physical and Aggregate Properties						
Texture			Clay Loam	Clay Loam	Clay Loam	
Sand	50 µm - 2 mm	% by weight	28	24	35	0.1
Silt	2 µm - 50 µm	% by weight	38	44	27	0.1
Clay	<2 µm	% by weight	34	32	38	0.1

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Reference Number	1484640-7
Sample Date	Apr 08, 2021
Sample Time	NA
Sample Location	
Sample Description	21-03 @ Surface
Matrix	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Sterilants in Soil					
Atrazine	Dry Weight	mg/kg	<0.005		0.005
Bromacil	Dry Weight	mg/kg	<0.008		0.008
Chlorotoluron	Dry Weight	mg/kg	<0.02		0.02
Cyanazine	Dry Weight	mg/kg	<0.02		0.02
Diuron	Dry Weight	mg/kg	<0.02		0.02
Fenuron	Dry Weight	mg/kg	<0.02		0.02
Isoproturon	Dry Weight	mg/kg	<0.02		0.02
Linuron	Dry Weight	mg/kg	<0.02		0.02
Metoxuron	Dry Weight	mg/kg	<0.02		0.02
Monolinuron	Dry Weight	mg/kg	<0.02		0.02
Simazine	Dry Weight	mg/kg	<0.02		0.02
Tebuthiuron	Dry Weight	mg/kg	<0.005		0.005
Sterilants - Soil - Surrogate Recovery					
Monuron	Surrogate	%	78		50-140

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-8	1484640-10	1484640-11	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-03 / 1.5 / m	21-04 / 1.5 / m	21-05 / 1.5 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Boron	Saturated Paste	mg/L	0.08	0.07	0.09	0.05
Antimony	Strong Acid Extractable	mg/kg	0.5	0.5	0.4	0.2
Arsenic	Strong Acid Extractable	mg/kg	9.2	9.0	7.7	0.2
Barium	Strong Acid Extractable	mg/kg	190	182	153	1
Beryllium	Strong Acid Extractable	mg/kg	0.7	0.7	0.7	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.25	0.17	0.12	0.01
Chromium	Strong Acid Extractable	mg/kg	23.0	25.7	21.6	0.5
Cobalt	Strong Acid Extractable	mg/kg	9.8	9.6	9.0	0.1
Copper	Strong Acid Extractable	mg/kg	23.0	21.2	19.5	1
Lead	Strong Acid Extractable	mg/kg	10.9	10.6	9.2	0.1
Mercury	Strong Acid Extractable	mg/kg	0.06	0.06	<0.05	0.05
Molybdenum	Strong Acid Extractable	mg/kg	1.1	<1.0	<1.0	1
Nickel	Strong Acid Extractable	mg/kg	30.0	34.0	28.0	0.5
Selenium	Strong Acid Extractable	mg/kg	0.3	0.4	<0.3	0.3
Silver	Strong Acid Extractable	mg/kg	<0.10	0.1	<0.10	0.1
Thallium	Strong Acid Extractable	mg/kg	0.21	0.19	0.18	0.05
Tin	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Uranium	Strong Acid Extractable	mg/kg	0.8	0.7	0.7	0.5
Vanadium	Strong Acid Extractable	mg/kg	28.4	29.2	28.8	0.1
Zinc	Strong Acid Extractable	mg/kg	77	72	62	1
Salinity						
Electrical Conductivity	Saturated Paste	dS/m	0.45	0.51	0.42	0.01
SAR	Saturated Paste		0.3	0.3	0.3	
% Saturation		%	64	64	67	
Calcium	Saturated Paste	mg/kg	41.4	50.3	38.8	
Magnesium	Saturated Paste	mg/kg	10.1	10.8	9.3	
Sodium	Saturated Paste	mg/kg	6	6	5	
Potassium	Saturated Paste	mg/kg	4	4	4	
Chloride	Saturated Paste	mg/L	6	13	10	2
Chloride	Saturated Paste	mg/kg	4	9	7	
Sulfate (SO4)	Saturated Paste	mg/kg	85.8	81.3	53.7	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
Soil Acidity						
pH	1:2 Soil:CaCl2 sol.	pH	7.5	7.2	7.2	
Water Soluble Parameters						
Chromium (VI)	Dry Weight	mg/kg	<0.05	<0.05	0.05	0.05
Mono-Aromatic Hydrocarbons - Soil						
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-8	1484640-10	1484640-11	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-03 / 1.5 / m	21-04 / 1.5 / m	21-05 / 1.5 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Soil - Continued						
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Methanol Field Preservation			Yes	Yes	Yes	
Volatile Petroleum Hydrocarbons - Soil						
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		9-Apr-21	9-Apr-21	9-Apr-21	
F2c C10-C16	Dry Weight	mg/kg	<25	<25	<25	25
F3c C16-C34	Dry Weight	mg/kg	<50	<50	<50	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	<100	100
% C50+		%	<5	<5	<5	
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	17.90	17.40	15.30	

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-12	1484640-13	1484640-15	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-05 / 3.0 / m	21-06 / 1.5 / m	21-07 / 2.3 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Boron	Saturated Paste	mg/L	0.09	0.09	0.10	0.05
Antimony	Strong Acid Extractable	mg/kg	0.5	0.5	0.4	0.2
Arsenic	Strong Acid Extractable	mg/kg	9.9	8.8	8.5	0.2
Barium	Strong Acid Extractable	mg/kg	204	185	203	1
Beryllium	Strong Acid Extractable	mg/kg	0.6	0.6	0.6	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.26	0.18	0.27	0.01
Chromium	Strong Acid Extractable	mg/kg	23.9	20.8	18.4	0.5
Cobalt	Strong Acid Extractable	mg/kg	10.8	9.8	8.9	0.1
Copper	Strong Acid Extractable	mg/kg	23.7	22.7	19.6	1
Lead	Strong Acid Extractable	mg/kg	11.2	10.5	9.7	0.1
Mercury	Strong Acid Extractable	mg/kg	0.06	<0.05	0.06	0.05
Molybdenum	Strong Acid Extractable	mg/kg	1.1	<1.0	<1.0	1
Nickel	Strong Acid Extractable	mg/kg	33.8	27.9	25.7	0.5
Selenium	Strong Acid Extractable	mg/kg	0.4	<0.3	0.3	0.3
Silver	Strong Acid Extractable	mg/kg	0.1	<0.10	<0.10	0.1
Thallium	Strong Acid Extractable	mg/kg	0.24	0.18	0.20	0.05
Tin	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Uranium	Strong Acid Extractable	mg/kg	0.8	0.8	0.9	0.5
Vanadium	Strong Acid Extractable	mg/kg	29.3	29.9	23.3	0.1
Zinc	Strong Acid Extractable	mg/kg	77	71	66	1
Salinity						
Electrical Conductivity	Saturated Paste	dS/m	1.11	0.36	0.31	0.01
SAR	Saturated Paste		0.4	0.3	0.3	
% Saturation		%	65	72	56	
Calcium	Saturated Paste	mg/kg	115	40.0	21.5	
Magnesium	Saturated Paste	mg/kg	27.8	8.6	8.3	
Sodium	Saturated Paste	mg/kg	15	6	6	
Potassium	Saturated Paste	mg/kg	6	4	3	
Chloride	Saturated Paste	mg/L	15	9	7	2
Chloride	Saturated Paste	mg/kg	10	6	4	
Sulfate (SO4)	Saturated Paste	mg/kg	365	56.7	29.4	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
Soil Acidity						
pH	1:2 Soil:CaCl2 sol.	pH	7.7	7.6	7.8	
Water Soluble Parameters						
Chromium (VI)	Dry Weight	mg/kg	<0.05	<0.05	0.05	0.05
Mono-Aromatic Hydrocarbons - Soil						
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-12	1484640-13	1484640-15	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-05 / 3.0 / m	21-06 / 1.5 / m	21-07 / 2.3 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Soil - Continued						
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Methanol Field Preservation			Yes	Yes	Yes	
Volatile Petroleum Hydrocarbons - Soil						
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		9-Apr-21	9-Apr-21	9-Apr-21	
F2c C10-C16	Dry Weight	mg/kg	<25	<25	<25	25
F3c C16-C34	Dry Weight	mg/kg	<50	<50	<50	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	<100	100
% C50+		%	<5	<5	<5	
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	21.20	17.10	17.20	

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Reference Number	1484640-13	1484640-14	1484640-16
Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021
Sample Time	NA	NA	NA
Sample Location			
Sample Description	21-06 / 1.5 / m	21-06 / 3.8 / m	21-07 / 3.8 / m
Matrix	Soil	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Physical and Aggregate Properties						
Texture			Clay	Clay	Clay Loam	
Sand	50 µm - 2 mm	% by weight	27	25	32	0.1
Silt	2 µm - 50 µm	% by weight	22	27	36	0.1
Clay	<2 µm	% by weight	51	48	32	0.1

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-17	1484640-18	1484640-19	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-08 / 1.5 / m	21-08 / 3.0 / m	21-09 / 1.5 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Boron	Saturated Paste	mg/L	0.14	0.15	0.09	0.05
Antimony	Strong Acid Extractable	mg/kg	0.4	0.4	0.4	0.2
Arsenic	Strong Acid Extractable	mg/kg	8.6	8.2	8.5	0.2
Barium	Strong Acid Extractable	mg/kg	176	150	198	1
Beryllium	Strong Acid Extractable	mg/kg	0.6	0.5	0.6	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.29	0.24	0.22	0.01
Chromium	Strong Acid Extractable	mg/kg	17.9	10.6	20.0	0.5
Cobalt	Strong Acid Extractable	mg/kg	8.8	7.4	9.2	0.1
Copper	Strong Acid Extractable	mg/kg	20.6	15.1	19.7	1
Lead	Strong Acid Extractable	mg/kg	9.6	8.0	9.7	0.1
Mercury	Strong Acid Extractable	mg/kg	<0.05	<0.05	<0.05	0.05
Molybdenum	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Nickel	Strong Acid Extractable	mg/kg	26.5	19.5	27.1	0.5
Selenium	Strong Acid Extractable	mg/kg	0.4	0.4	0.3	0.3
Silver	Strong Acid Extractable	mg/kg	<0.10	<0.10	<0.10	0.1
Thallium	Strong Acid Extractable	mg/kg	0.21	0.17	0.19	0.05
Tin	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Uranium	Strong Acid Extractable	mg/kg	1.0	1.2	0.7	0.5
Vanadium	Strong Acid Extractable	mg/kg	22.9	17.8	26.4	0.1
Zinc	Strong Acid Extractable	mg/kg	68	60	68	1
Salinity						
Electrical Conductivity	Saturated Paste	dS/m	0.50	0.54	0.47	0.01
SAR	Saturated Paste		0.5	0.4	0.3	
% Saturation		%	58	46	57	
Calcium	Saturated Paste	mg/kg	28.1	31.0	37.8	
Magnesium	Saturated Paste	mg/kg	12.9	9.2	9.8	
Sodium	Saturated Paste	mg/kg	10	6	6	
Potassium	Saturated Paste	mg/kg	5	4	3	
Chloride	Saturated Paste	mg/L	25	64	39	2
Chloride	Saturated Paste	mg/kg	14	29	23	
Sulfate (SO4)	Saturated Paste	mg/kg	61.4	39.1	49.4	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
Soil Acidity						
pH	1:2 Soil:CaCl2 sol.	pH	7.4	7.5	7.6	
Water Soluble Parameters						
Chromium (VI)	Dry Weight	mg/kg	<0.05	<0.05	<0.05	0.05
Mono-Aromatic Hydrocarbons - Soil						
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

		Reference Number	1484640-17	1484640-18	1484640-19	
		Sample Date	Apr 08, 2021	Apr 08, 2021	Apr 08, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-08 / 1.5 / m	21-08 / 3.0 / m	21-09 / 1.5 / m	
		Matrix	Soil	Soil	Soil	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Soil - Continued						
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Methanol Field Preservation			Yes	Yes	Yes	
Volatile Petroleum Hydrocarbons - Soil						
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		9-Apr-21	9-Apr-21	9-Apr-21	
F2c C10-C16	Dry Weight	mg/kg	<25	<25	<25	25
F3c C16-C34	Dry Weight	mg/kg	<50	<50	<50	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	<100	100
% C50+		%	<5	<5	<5	
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	14.70	16.90	14.00	

Analytical Report

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Reference Number	1484640-20
Sample Date	Apr 08, 2021
Sample Time	NA
Sample Location	
Sample Description	21-09 / 3.8 / m
Matrix	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Physical and Aggregate Properties					
Texture		Clay Loam			
Sand	50 µm - 2 mm	% by weight	32		0.1
Silt	2 µm - 50 µm	% by weight	29		0.1
Clay	<2 µm	% by weight	39		0.1

Approved by:



Anthony Neumann, MSc
General Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Quality Control

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Extractable Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	µg/mL	0	-10	10	yes
F3c C16-C34	µg/mL	0	-30	30	yes
F4c C34-C50	µg/mL	0	-20	20	yes
F4HTGCc C34-C50+	µg/mL	0	-20	20	yes

Date Acquired: April 08, 2021

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	µg/mL	100.86	80	120	yes
F3c C16-C34	µg/mL	103.17	80	120	yes
F4c C34-C50	µg/mL	100.68	80	120	yes
F4HTGCc C34-C50+	µg/mL	97.96	80	120	yes

Date Acquired: April 08, 2021

Metals Strong Acid Digestion

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Boron	mg/L	0.0102	-0.05	0.07	yes
Antimony	µg/L	0.00859821	-0.1	0.2	yes
Arsenic	µg/L	0.00742352	-0.2	0.2	yes
Barium	µg/L	0.119781	-1	1	yes
Beryllium	µg/L	0.00838636	-0.1	0.1	yes
Cadmium	µg/L	0.00197303	-0.01	0.01	yes
Chromium	µg/L	0.0240434	-0.5	0.5	yes
Cobalt	µg/L	0.00583768	-0.1	0.1	yes
Copper	µg/L	0.0473278	-0.6	1.2	yes
Lead	µg/L	0.011497	-5.0	5.0	yes
Mercury	µg/L	0.00367231	-0.04	0.04	yes
Molybdenum	µg/L	0.0375835	-1.0	1.0	yes
Nickel	µg/L	0.0196936	-0.4	0.7	yes
Selenium	µg/L	0.0144453	-0.3	0.3	yes
Silver	µg/L	0.00469621	-0.09	0.14	yes
Thallium	µg/L	0.00622613	-0.04	0.04	yes
Tin	µg/L	0.0318138	-0.4	0.4	yes
Uranium	µg/L	0.0174609	-0.5	0.5	yes
Vanadium	µg/L	-0.00282356	-0.1	0.1	yes
Zinc	µg/L	0.196037	-1	1	yes

Date Acquired: April 09, 2021

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Antimony	mg/kg	40.0	37.8	42.2	yes
Arsenic	mg/kg	38.7	36.3	43.9	yes
Barium	mg/kg	207	188	212	yes
Beryllium	mg/kg	19.4	17.4	22.2	yes
Cadmium	mg/kg	2.08	1.88	2.28	yes
Chromium	mg/kg	95.1	93.2	107.0	yes

Quality Control

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Metals Strong Acid Digestion - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Cobalt	mg/kg	18.4	18.2	21.2	yes
Copper	mg/kg	189	183.1	212.7	yes
Lead	mg/kg	19.2	18.3	21.3	yes
Mercury	mg/kg	2.96	2.64	3.36	yes
Molybdenum	mg/kg	201	185.1	222.3	yes
Nickel	mg/kg	93.9	92.4	106.2	yes
Selenium	mg/kg	40.9	35.2	44.2	yes
Silver	mg/kg	20.6	18.20	22.40	yes
Thallium	mg/kg	9.80	9.02	10.82	yes
Tin	mg/kg	210	191.2	215.2	yes
Uranium	mg/kg	103	86.0	116.0	yes
Vanadium	mg/kg	18.7	18.0	21.6	yes
Zinc	mg/kg	191	186	210	yes
Date Acquired: April 09, 2021					
Antimony	mg/kg	3.8	3.2	4.7	yes
Arsenic	mg/kg	4.6	3.4	5.2	yes
Barium	mg/kg	103	82	124	yes
Beryllium	mg/kg	0.3	0.2	0.5	yes
Cadmium	mg/kg	0.99	0.78	1.20	yes
Chromium	mg/kg	86.9	70.9	98.5	yes
Cobalt	mg/kg	6.6	5.8	8.2	yes
Copper	mg/kg	126	108.4	148.0	yes
Lead	mg/kg	265	200.6	318.8	yes
Mercury	mg/kg	0.07	0.05	0.09	yes
Molybdenum	mg/kg	1.1	0.9	1.4	yes
Nickel	mg/kg	27.0	22.5	32.1	yes
Selenium	mg/kg	<0.3	0.3	0.3	yes
Silver	mg/kg	5.3	2.28	6.00	yes
Thallium	mg/kg	0.08	0.05	0.10	yes
Tin	mg/kg	10.3	8.4	12.6	yes
Uranium	mg/kg	<0.5	0.3	0.7	yes
Vanadium	mg/kg	30.8	17.8	46.9	yes
Zinc	mg/kg	339	283	390	yes
Date Acquired: April 09, 2021					

Mono-Aromatic Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Benzene	ng	0	-0.005	0.005	yes
Toluene	ng	0	-0.06	0.06	yes
Ethylbenzene	ng	0	-0.030	0.030	yes
Total Xylenes (m,p,o)	ng	0	-0.09	0.09	yes
Styrene	ng	0	-0.030	0.030	yes
Date Acquired: April 08, 2021					

Quality Control

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Mono-Aromatic Hydrocarbons - Soil - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	100.72	80	120	yes
Toluene	ng	89.83	80	120	yes
Ethylbenzene	ng	86.58	80	120	yes
m,p-Xylene	ng	97.84	80	120	yes
Total Xylenes (m,p,o)	ng	98.66	80	120	yes
Styrene	ng	89.14	80	120	yes

Date Acquired: April 08, 2021

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Benzene	mg/kg	<0.005	<0.005	50	0.010	yes
Toluene	mg/kg	<0.02	<0.02	50	0.04	yes
Ethylbenzene	mg/kg	<0.005	<0.005	50	0.020	yes
m,p-Xylene	mg/kg	<0.02	<0.02	50	0.04	yes
o-Xylene	mg/kg	<0.02	<0.02	50	0.04	yes
Total Xylenes (m,p,o)	mg/kg	<0.03	<0.03	50	0.06	yes
Styrene	mg/kg	<0.01	<0.01	50	0.020	yes

Date Acquired: April 08, 2021

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	mg/kg	112	70	130	yes
Toluene	mg/kg	115	70	130	yes
Ethylbenzene	mg/kg	114	70	130	yes
m,p-Xylene	mg/kg	113	70	130	yes
o-Xylene	mg/kg	103	70	130	yes

Date Acquired: April 08, 2021

Physical and Aggregate Properties

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Sand	% by weight	27	20	32	yes
Clay	% by weight	32	27	36	yes
<50 um	% by weight	73.4	67.500	82.500	yes

Date Acquired: April 08, 2021

Salinity

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	0.0121	-0.4	0.5	yes
Magnesium	mg/L	0.0038	-0.1	0.1	yes
Sodium	mg/L	-0.041	-0	2	yes
Potassium	mg/L	-0.0121	-0.5	0.7	yes
Chloride	mg/L	2.2222	0	5	yes
Sulfate-S	mg/L	0.0832	-0	1	yes

Date Acquired: April 09, 2021

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Electrical Conductivity	dS/m	1.57	1.31	1.79	yes

Quality Control

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Salinity - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
% Saturation	%	56	55	67	yes
Calcium	mg/L	299	231.4	347.2	yes
Magnesium	mg/L	53.1	40.3	60.7	yes
Sodium	mg/L	23	20	26	yes
Potassium	mg/L	11.8	9.6	13.2	yes
Chloride	mg/L	29	25	33	yes
Sulfate-S	mg/L	217	175	242	yes
Date Acquired: April 09, 2021					
Electrical Conductivity	dS/m	32.3	26.80	35.20	yes
Calcium	mg/L	244	231.3	256.5	yes
Magnesium	mg/L	97.1	92.7	101.7	yes
Sodium	mg/L	248	225	264	yes
Potassium	mg/L	248	222.6	270.6	yes
Chloride	mg/L	2130	1852	2229	yes
Sulfate-S	mg/L	147	138	156	yes
Date Acquired: April 09, 2021					

Soil Acidity

Client Sample Replicates		Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
pH		pH	7.8	7.9	10	0.3	yes
Date Acquired:		April 09, 2021					
Control Sample		Units	Measured	Lower Limit	Upper Limit	Passed QC	
pH		pH	6.6	6.3	6.9	yes	
Date Acquired:		April 09, 2021					

Sterilants in Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Atrazine	ng	0	-0.008	0.008	yes
Bromacil	ng	0	-0.030	0.030	yes
Chlorotoluron	ng	0	-0.03	0.03	yes
Cyanazine	ng	0	-0.03	0.03	yes
Diuron	ng	0	-0.03	0.03	yes
Fenuron	ng	0	-0.03	0.03	yes
Isoproturon	ng	0	-0.03	0.03	yes
Linuron	ng	0	-0.03	0.03	yes
Metoxuron	ng	0	-0.03	0.03	yes
Monolinuron	ng	0	-0.03	0.03	yes
Simazine	ng	0	-0.03	0.03	yes
Tebuthiuron	ng	0	-0.008	0.008	yes
Date Acquired: April 11, 2021					
Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Atrazine	ng	97.50	80	120	yes
Bromacil	ng	101.50	80	120	yes

Quality Control

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Sterilants in Soil - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Chlorotoluron	ng	97.50	80	120	yes
Cyanazine	ng	99.00	80	120	yes
Diuron	ng	98.50	80	120	yes
Fenuron	ng	97.50	80	120	yes
Isoproturon	ng	97.50	80	120	yes
Linuron	ng	97.50	80	120	yes
Metoxuron	ng	97.50	80	120	yes
Monolinuron	ng	98.00	80	120	yes
Simazine	ng	98.00	80	120	yes
Tebuthiuron	ng	98.00	80	120	yes

Date Acquired: April 11, 2021

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Atrazine	mg/kg	<0.005	<0.005	50	0.010	yes
Bromacil	mg/kg	<0.008	<0.008	50	0.040	yes
Chlorotoluron	mg/kg	<0.02	<0.02	50	0.04	yes
Cyanazine	mg/kg	<0.02	<0.02	50	0.04	yes
Diuron	mg/kg	<0.02	<0.02	50	0.04	yes
Fenuron	mg/kg	<0.02	<0.02	50	0.04	yes
Isoproturon	mg/kg	<0.02	<0.02	50	0.04	yes
Linuron	mg/kg	<0.02	<0.02	50	0.04	yes
Metoxuron	mg/kg	<0.02	<0.02	50	0.04	yes
Monolinuron	mg/kg	<0.02	<0.02	50	0.04	yes
Simazine	mg/kg	<0.02	<0.02	50	0.04	yes
Tebuthiuron	mg/kg	<0.005	<0.005	50	0.010	yes

Date Acquired: April 11, 2021

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Atrazine	mg/kg	86	40	140	yes
Bromacil	mg/kg	69	40	140	yes
Chlorotoluron	mg/kg	85	40	140	yes
Cyanazine	mg/kg	91	40	140	yes
Diuron	mg/kg	82	40	140	yes
Fenuron	mg/kg	55	40	140	yes
Isoproturon	mg/kg	87	40	140	yes
Linuron	mg/kg	74	40	140	yes
Metoxuron	mg/kg	72	40	140	yes
Monolinuron	mg/kg	74	40	140	yes
Simazine	mg/kg	86	40	140	yes
Tebuthiuron	mg/kg	78	40	140	yes

Date Acquired: April 11, 2021

Volatile Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F1 C6-C10	ng	0	-10	10	yes

Quality Control

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Volatile Petroleum Hydrocarbons - Soil - Continued

Continued

Blanks	Units	Measured	Lower Limit	Upper Limit		Passed QC
Date Acquired: April 08, 2021						
Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
F1 C6-C10	mg/kg	<10	<10	50	0	yes
F1 -BTEX	mg/kg	<10	<10	50	0	yes
Date Acquired: April 08, 2021						
Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit		Passed QC
F1 C6-C10	mg/kg	99	70	130		yes
Date Acquired: April 08, 2021						

Water Soluble Parameters

Blanks		Units	Measured	Lower Limit	Upper Limit	Passed QC	
Chromium (VI)		mg/L	0	-0.10	0.10	yes	
Date Acquired: April 09, 2021							
Client Sample Replicates		Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Chromium (VI)		mg/kg	0.9	0.8	10	0.01	yes
Date Acquired: April 09, 2021							

Methodology and Notes

Bill To: City of Edmonton Engineering Services 11004-190 Street Edmonton, AB, Canada T5S 0G9	Project ID: CEL-37544A Project Name: Limited Phase II ESA – Portion of Ogilvie Ridge Park Project Location: 915 Ogilvie Blvd NW LSD: P.O.: 4000109379 Proj. Acct. code:	Lot ID: 1484640 Control Number: Date Received: Apr 8, 2021 Date Reported: Apr 16, 2021 Report Number: 2610888
Attn: Jesse Buswell Sampled By: DP Company: Crimson		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
1:5 Water Soluble Extraction	APHA	* Colorimetric Method, 3500-Cr B	Apr 9, 2021	Element Edmonton - Roper Road
1:5 Water Soluble Extraction	McKeague	* Soluble Salts in Extracts of 1:5 Soil:Water Mixtures, 3.23	Apr 9, 2021	Element Edmonton - Roper Road
BTEX-CCME - Soil	CCME	* Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	Apr 8, 2021	Element Calgary
BTEX-CCME - Soil	US EPA	* Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260	Apr 8, 2021	Element Calgary
Metals ICP (Hot Block) in soil	EPA	* Sample Preparation Procedure for Spectrochemical Determination of Total Recoverable Elements, October 1999, 200.2	Apr 9, 2021	Element Edmonton - Roper Road
Metals ICP (Hot Block) in soil	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Apr 9, 2021	Element Edmonton - Roper Road
Particle Size Analysis - GS	Carter	* Hydrometer Method, 55.3	Apr 8, 2021	Element Edmonton - Roper Road
pH by CaCl ₂ (1:2 ratio) in soil	McKeague	* pH in 0.01M Calcium Chloride, 3.11	Apr 9, 2021	Element Edmonton - Roper Road
Saturated Paste in General Soil	APHA	* Automated Ferricyanide Method, 4500-Cl-E	Apr 9, 2021	Element Edmonton - Roper Road
Saturated Paste in General Soil	Carter	* Electrical Conductivity and Soluble Ions, Chapter 15	Apr 9, 2021	Element Edmonton - Roper Road
Sterilants - Soil	US EPA	* Solvent Extractable Nonvolatile Compounds by HPLC/TS/MS or UV Detection, 8321 B	Apr 11, 2021	Element Calgary
TEH-CCME-Soil (Shake)	CCME	* Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	Apr 8, 2021	Element Calgary

* Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
Carter	Soil Sampling and Methods of Analysis.
CCME	Canadian Council of Ministers of the Environment
EPA	Environmental Protection Agency Test Methods - US
McKeague	Manual on Soil Sampling and Methods of Analysis
US EPA	US Environmental Protection Agency Test Methods

Methodology and Notes

Bill To:	City of Edmonton	Project ID:	CEL-37544A	Lot ID:	1484640
	Engineering Services	Project Name:	Limited Phase II ESA –	Control Number:	
	11004-190 Street		Portion of Ogilvie Ridge	Date Received:	Apr 8, 2021
	Edmonton, AB, Canada	Project Location:	Park	Date Reported:	Apr 16, 2021
	T5S 0G9	LSD:	915 Ogilvie Blvd NW	Report Number:	2610888
Attn:	Jesse Buswell	P.O.:	4000109379		
Sampled By:	DP	Proj. Acct. code:			
Company:	Crimson				

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.