THE WAY WE GREEN

Environmental Site Assessment Guidebook

March 2016

TRANSFORMING | EDMONTON

BRINGING OUR CITY VISION TO LIFE

CITY OF Edmonton

List of Acronyms

AER	Alberta Energy Regulator
AG	Agricultural Zone (land use zone)
AGU	Urban Reserve Zone (land use zone)
AGI	Industrial Reserve Zone (land use zone)
AHS	Alberta Health Services
AP	Public Parks Zone (land use zone)
CSA	Canadian Standards Association
DC1	Direct Development Control Provision (land use zone)
DC2	Site Specific Development Control Provision (land use zone)
EPEA	Environmental Protection and Enhancement Act (Government of Alberta)
ESAR	Environmental Site Assessment Repository
AEP	Alberta Environment and Parks (Government of Alberta)
EC	Electrical conductivity
EEC	Environmental and Energy Coordination Unit (City of Edmonton)
EM	Electromagnetic (survey)
ESA	Environmental Site Assessment
FOIP	Freedom of Information and Protection of Privacy
LDA	Land Development Application
PCBs	Polychlorinated Biphenyls
PTMAA	Petroleum Tank Management Association of Alberta
PU	Public Utility Zone (land use zone)
US	Urban Service Zone (land use zone)

Table of Contents

1.0 INTRODUCTION 4

2.0 BACKGROUND 4

3.0 LDA ENVIRONMENTAL REPORT REQUIREMENTS 4
3.1 Structure Plans 4
3.2 Rezoning and Subdivisions 5
3.3 Development Permits 5
3.2 Road Closures 6

4.0 ESA CIRCULATION AND APPROVAL PROCESS 6
4.1 Submission Requirements for ESA Reports 8

5.0 ENVIRONMENTAL OVERVIEW REPORT REQUIREMENTS 8

6.0 PHASE I ESA REPORT REQUIREMENTS 10
6.1 PHASE I ESA UPDATE – REPORT REQUIREMENTS 11
6.1.1 Greenfield Site Report Requirements 12
6.1.2 Non-Greenfield Site Report Requirements 12

7.0 PHASE II ESA REPORT REQUIREMENTS 12
7.1 Phase II ESA Reporting 13
7.1.1 EM Survey Investigation for Oil and Gas Facilities 13

8.0 REMEDIATION AND/OR EXPOSURE CONTROL 15

9.0 DEFINITIONS 16

1.0 INTRODUCTION

This document was developed by the City of Edmonton to outline the Environmental Site Assessment (ESA) requirements for Land Development Applications (LDAs). This includes LDAs for all of the following: structure plans, rezoning, subdivision, road closure and development permit applications. Administration has an obligation, as per the Municipal Development Plan under Section 9.5.1, to ensure site suitability for specific LDAs.

2.0 BACKGROUND

Part of the LDA process is to exercise environmental due diligence to determine if the site is suitable for the intended use under the Zoning Bylaw. Reports such as an Environmental Overview Report and Phase I, II, and III ESA Report(s) can determine site suitability, and help City Council make their decisions.

An explanation of each type of report is described below:

1. An Environmental Overview is used solely for the purpose of structure plans.
2. Phase I ESA involves a non-intrusive desktop review of the current and historical environmental information relevant to the site.
3. Phase II ESA involves intrusive investigation and delineation of areas of potential environmental concern for contaminants through characterization of soil and groundwater. This must be conducted if recommendations in the Phase I ESA indicate that areas of potential environmental concerns are present on the site or if the City (Environmental Energy and Coordination Unit) believes that it is warranted.
4. Phase IIII ESA, which involves remediation and/or exposure control, includes various type of remediation technology which may include excavation and disposal, soil vapour extraction, risk management and/or exposure control of the site or a combination of the above.

The City of Edmonton Environmental and Energy Coordination Unit (EEC), in the Sustainable Development Department, administers the environmental review process for LDAs.

3.0 LDA ENVIRONMENTAL REPORT REQUIREMENTS

3.1 Structure Plans

This includes Area Structure Plans (ASP) and Neighbourhood Structure Plans (NSP). At the structure plan stage, an Environmental Overview is required. Please see page 8 for a list of requirements to be included in the Environmental Overview for structure plans.

3.2 Rezoning and Subdivisions

Rezoning and Subdivision applications require a Phase I ESA when the existing zoning of a land parcel has:

- Commercial Zones
- Industrial Zones
- Urban Service Zones
- Agricultural and Reserve Zones
- Special Area Zones; and
- Direct Development Control Provisions (DC1) or Site Specific Development Control Provisions (DC2) that is not exclusively residential in use.

For land parcels that are already zoned for exclusive residential uses, the EEC does not normally require an ESA. However, if other information indicates potential contamination issues, then a Phase I ESA is required.

For **rezoning**, a Direct Control Zone may be placed on a contaminated site in order to specify the level of clean-up or risk management/exposure control measures required prior to or concurrent with a development permit approval.

For **subdivision applications**, Phase I ESAs should cover the entire titled lot to be subdivided, however in most instances the City of Edmonton will look at confirming site suitability only for parcels being created. Subdivisions will not require a Phase I ESA if the site has already received environmental sign off from the EEC at the rezoning stage.

3.3 Development Permits

A Phase I ESA is required for any development permits where the Development Officer has reason to believe that contaminants may exist and/or the Edmonton Zoning Bylaw establishes these requirements through a DC1 or a DC2 zone.

A Direct Control Zone may be placed on a contaminated property in order to specify the level of remediation or risk management/exposure control measures required prior to or concurrent with development permit approval. The development permit will not require a Phase I ESA if the site has already received environmental sign off from the EEC unless the provincial criteria has been changed.

The following are useful guidelines for understanding where exclusion from ESA requirements may occur for Development Permit applications.

Exclusions **shall be granted** for:
1. Interior and exterior alteration applications (for all use categories)
2. Accessory buildings and structures in all land use categories, including residential, which are intended primarily for storage or occasional activity.
3. Non-Residential Change of Use that does not add residential or residential related use.

Exclusions **may be considered** for:
1. Additions to non-Residential use buildings which:
    a. Do not require excavations for basements or other below grade activities
    b. Do not increase Site Coverage over 10% of that existing or
    c. Do not exceed 75 square metres.
2. Construction of new buildings for non-Residential Uses which replace existing buildings also of non-Residential Use in approximately the same location of the Site.

No exclusions shall be granted for:
1. Applications for new construction of principal buildings with residential or residential related uses.
2. Additions to existing buildings which are occupied entirely or in part by Residential and Residential-Related Uses, unless noted above.
3. Applications for Change of Use to Residential or Residential-related use where not previously existing on a Site.
4. Non-Residential Uses applications (new buildings and additions) not specifically listed above as candidates for exclusions.
5. Any application on a site where any of the ESA's are incomplete or deficient.
6. Any application on a site where the EEC sees a deficiency in a report or where a Phase I, II or III ESA has either been required in previous LDA applications but remains incomplete or been specifically deferred to the Development Permitting process.

3.2 Road Closures

When a Phase I ESA is required for a rezoning or subdivision application, it should also cover the area for any proposed road closures.

A Phase I ESA may be required for simple road closures. The ESA review requirements for simple road closures are determined by the Transportation Services Department.

4.0 ESA CIRCULATION AND APPROVAL PROCESS

Once the EEC receives the ESA report, the EEC proceeds to coordinate the environmental review aspect of the LDA. The EEC is responsible for the ESA with

respect to environmental due diligence, and providing sign off for the subject site. An LDA application will not be approved and signed off until the report(s) prove that the subject site meets the applicable provincial criteria for the range of allowable land uses or acceptable risk management/exposure control approaches are in place.

The EEC circulates ESA reports to different review agencies for technical review. These review agencies may include groups such as Alberta Environment and Parks (AEP) or Alberta Energy Regulator (AER), Alberta Health Services (AHS) and the City of Edmonton Integrated Infrastructure Services Department (Engineering Services). Phase II and III ESA reports for upstream oil and gas sites are reviewed by AER rather than by AEP.

The circulation process varies depending on the type of ESA report submitted. The following provides an explanation of the process for each type of ESA report:

Environmental Overview: The EEC unit receives and reviews the Environmental Overview. Sign off is provided by the EEC unit.

Phase I ESA: The EEC circulates Phase I ESAs and Updates to the City of Edmonton Engineering Services for technical review. The circulation period is 3 - 4 weeks.
.
If the recommendation from a Phase I ESA determines that further investigation is required, then a Phase II ESA must be completed and submitted, by the applicant, to the planner for review. A Phase II ESA may also be required if the EEC believes that it is warranted. The EEC is responsible for reviewing and providing direction and sign off based on the Phase I ESA.

Phase II ESA: All Phase II ESAs are circulated and coordinated through the EEC and sent to AEP or AER, AHS and the City of Edmonton Transportation Services Department. AEP circulation requires 6-8 weeks for review. The EEC obtains Phase II ESA approval from these groups before the site is signed off.

Phase III ESA: All Phase III ESAs are circulated and coordinated through the EEC to AEP or AER, AHS and the City of Edmonton Transportation Services Department. The EEC obtains report approval from these groups before the site is signed off.

The following section is a summary of requirements when submitting an Environmental Overview reports, Phase I, II, III ESA reports and risk management/exposure control plans to the EEC Unit.

4.1 Submission Requirements for ESA Reports

When submitting an Environmental Overview, Phase I, II or III ESA report to the EEC Unit, the following outlines the requirements and responsibilities involved in preparing the circulation package:

1. The Planner prepares a cover letter and maps with details regarding the LDA application. Provide a separate cover letter for each LDA application.
2. The LDA applicant provides four bound printed hard copies to the Planner (one copy per reviewer – AEP or AER, AHS, Transportation Services Department, and EEC Unit).
3. The LDA applicant provides an electronic version of the report(s).

Please note: all correspondence, addendums or extra information for an application should always be directed to the file planner.

All ESA reports must be signed and stamped by one of the seven professional regulatory organizations as required by AEP. (http://esrd.alberta.ca/lands-forests/land-industrial/programs-and-services/reclamation-and-remediation/professional-sign-off-for-upstream-oil-and-gas-reclamation-certificate-work.aspx).

5.0 ENVIRONMENTAL OVERVIEW REPORT REQUIREMENTS

An Environmental Overview is required only at the ASP and NSP stage. The following is a comparison of an Environmental Overview Report compared to a Phase I ESA Report.

Following the comparison table is the required Table of Contents and Appendices for an Environmental Overview Report:

Information Requirements	Phase I ESA at rezoning	ASP and NSP Environmental Overview
Review of Site Information (Topography, Soils & Groundwater)	✓	✓
Review of Online Databases (publicly available -- ESAR)	✓	✓
Review Other Environmental Reports	✓	

Historical Land Uses	✓	
Interviews with Participating Landowners	✓	✓
Review of Aerial Photos	✓ (5-7 yr interv)	✓ (5-7 yr interv)
Municipal, Provincial & Federal Regulatory Agency Records Check	✓	
Site Visit	✓	✓
Older that 1 year -Update required	✓	
Older that 5 years – New Report	✓	

Environmental Overview Requirements – Table of Contents

1.0 Introduction
- 1.1 Background
- 1.2 Objective
- 1.3 Scope of Work

2.0 Review of Site Information
- 2.1 Topography and Soils
- 2.2 Hydrogeology
- 2.3 Historical Air Photos

3.0 Review of Online Databases
- 3.1 Pipelines, Oil Wells, and Spills/Releases
- 3.2 Coal Mines
- 3.3 Waterwells
- 3.4 Publicly Available Reports and Information (ESAR)
- 3.5 Land Reclamation Certificates (ESAR)

4.0 Site Visit
- 4.1 Site Description / Owner Interview

5.0 Areas of Potential Environmental Concern (APECs)

6.0 Limitations

7.0 References

Appendices

Appendix A Aerial Photos
Appendix B Map - Pipelines and Oil Wells/Batteries
Appendix C Map - Coal Mines
Appendix D Map - Water Wells
Appendix E Map – APECs of Subject Area
Appendix F ESAR Search
Appendix G Site Photos

List of Tables

Aerial Photo Summary
Coal Mines

List of Figures

Site Location

6.0 PHASE I ESA REPORT REQUIREMENTS

1. Review of historical land uses of the site and adjacent properties.
2. Summary of historical land titles for the property going as far back as the record exists (actual copies of the title(s) not required).
3. Current and previous property owners and business owner interviews.
4. Aerial photograph review:
    a. Coverage every 5-7 years, or more frequently as necessary to show change in property use,
    b. Aerial photographs shall date back as far as possible,
    c. Scale of 1:5000 with good resolution and high quality printing; and
    d. Aerial photography review section shall include a summary table containing a description of each photograph highlighting the land use changes and notable activities/features.
5. A review of municipal directories (e.g. Henderson Directories, Fire Insurance Plans, etc.) should date back as far as possible and include a review of nearby properties; the information should be summarized in a table format with an associated key location map to be provided.
6. Summary of all previous ESA reports that are related to the property including a review of the most recent criteria compared to the historical analytical data. Submission of the copies of historical ESA reports may be required.
7. The following regulatory agency checks are required:
    a. City of Edmonton Fire Rescue Services,
    b. City of Edmonton Drainage Services - Sewers Bylaw and Sewers Use Bylaw,
    c. City of Edmonton Waste Management Services,
    d. AEP Freedom of Information and Protection of Privacy (FOIP)
    e. AEP Environmental Site Assessment Repository (ESAR),

   f. Alberta Energy Regulator,
   g. Alberta Health Services,
   h. Environmental Law Centre; and
   i. Petroleum Tank Management Association of Alberta.
8. Present-day review of the property and nearby lands, including site visit. An unencumbered inspection of suspected areas will be the owner's responsibility, e.g. removal of snow cover from areas of interest on the site.
9. The Phase I ESA shall comply with the mandatory section of the Canadian Standards Association (CSA) Phase I environmental site assessment guide (Z768-.01-reaffirmed 2012). Also required by the City of Edmonton are the optional Sections for the CSA related to the description of the geology and hydrogeology of the area for the property using the best information sources available.

The Phase I ESA should provide concise conclusion and recommendations which should indicate whether additional investigation is warranted. Conclusions should clearly outline any areas of potential environmental concern (APECs) and contaminants of potential concern on the site or on adjacent sites that may affect the environmental condition of the property.

Regulatory agency check of the municipal agencies listed under requirement #7 above can be completed by contacting the appropriate municipal department. The City of Edmonton website contains useful City contacts: http://www.edmonton.ca/city_government/environmental_stewardship/environmental-inquiries-on-property.aspx.

Please note that there are additional agencies listed in requirement #7 that are not in the list found at the above website. For a Phase I ESA to be accepted, all agencies in requirement #7 must be contacted and all correspondence must be included in the Phase I ESA report.

Each regulatory agency must be contacted separately and a letter of consent from the property or company owner(s) may be required. For each regulatory search, be prepared to provide: street address, legal address, tax roll account number (if available) and whether the property contains a structure(s) or is vacant. There may be fees connected with regulatory agency searches.

6.1 PHASE I ESA UPDATE – REPORT REQUIREMENTS

ESA reports must be current to the LDA application. The Phase I ESA report must be within 1 year of the application date. Any report submitted over a year of the application date requires a Phase I ESA update. This is a requirement because site conditions

change as time goes on and the City of Edmonton is required to review the most recent information available.

At the time of LDA submission, the following are the report update requirements:

- Phase I ESA is less than one year old: this is current and can be submitted
- The most recent full Phase I ESA is between 1 to 5 years old: a Phase I ESA **update** is required.
- The most recent full Phase I ESA report is greater than 5 years old: a brand **new full Phase I ESA** required.

There are two types of Phase I ESA Updates: Greenfield sites and non-Greenfield sites (definition on page 16).

6.1.1 Greenfield Site Report Requirements

For the purposes of these procedures and guidelines, a Greenfield site is property in a newly developing suburban area that has AG, AGU, AGI, US, AP or PU zoning that remains in its natural state or has been used only for farming purposes and has never been occupied by a farmstead or storage tanks.

Phase I ESA greenfield site update requirements are:

1. A statement from the property owner for any knowledge of any contamination.
2. An update letter based on a new site inspection from an environmental professional.

6.1.2 Non-Greenfield Site Report Requirements

A Phase I ESA Update must contain:

1. A statement from the property owner for any knowledge of any contamination.
2. An update letter based on a new site inspection from an environmental professional.
3. Updated regulatory authority checks, except from the City of Edmonton Waste Management Services.

7.0 PHASE II ESA REPORT REQUIREMENTS

If an intrusive investigation is recommended based on the findings of the Phase I ESA, then a Phase II ESA will be required by the City of Edmonton. A Phase II ESA deemed acceptable by the City of Edmonton would follow the procedure and format set in the most current CSA Guideline Z769-00. The formal requirements of AEP are detailed in a PDF at the Alberta Government web site:
http://environment.gov.ab.ca/info/library/8720.pdf.

7.1 Phase II ESA Reporting

For a Phase II ESA Report, the following are general recommendations:

1. Include an executive summary, introduction, background, scope of work, applicable soil and groundwater guidelines, sampling/field methodology, results, quality control, discussion, recommendations.
2. Groundwater characterization for Phase II ESAs is preferred; however, if the consultant indicates groundwater characterization is not required, rationale for the decision will be required by the City of Edmonton. The City of Edmonton will review the rationale and may require groundwater characterization if the rationale provided is not satisfactory.
3. Provide concise conclusions and recommendations. Conclusions should clearly outline the environmental condition of the property and highlight any outstanding environmental concerns present on the property from both onsite and offsite sources.
4. Recommendations provided should indicate whether further investigation, remediation and/or exposure control measures should be implemented.

7.1.1 EM Survey Investigation for Oil and Gas Facilities

An Electromagnetic (EM) survey may be required for certain LDA applications where an oil and gas facility was located in proximity the subject site. Details about requirements are discussed below.

EM surveys are widely used to complement regulatory ESAs at oil and gas related facilities. EM surveys are used to locate subsurface infrastructure and potential contamination, for example, contaminated related to drilling sumps, flare pits and pipeline releases. An EM survey uses the principle of induction to measure the electrical conductivity (EC) of the subsurface. EC data can be used to interpret subsurface conditions including the buried infrastructure, tankage, major changes in stratigraphy and in some cases environmental impacts.

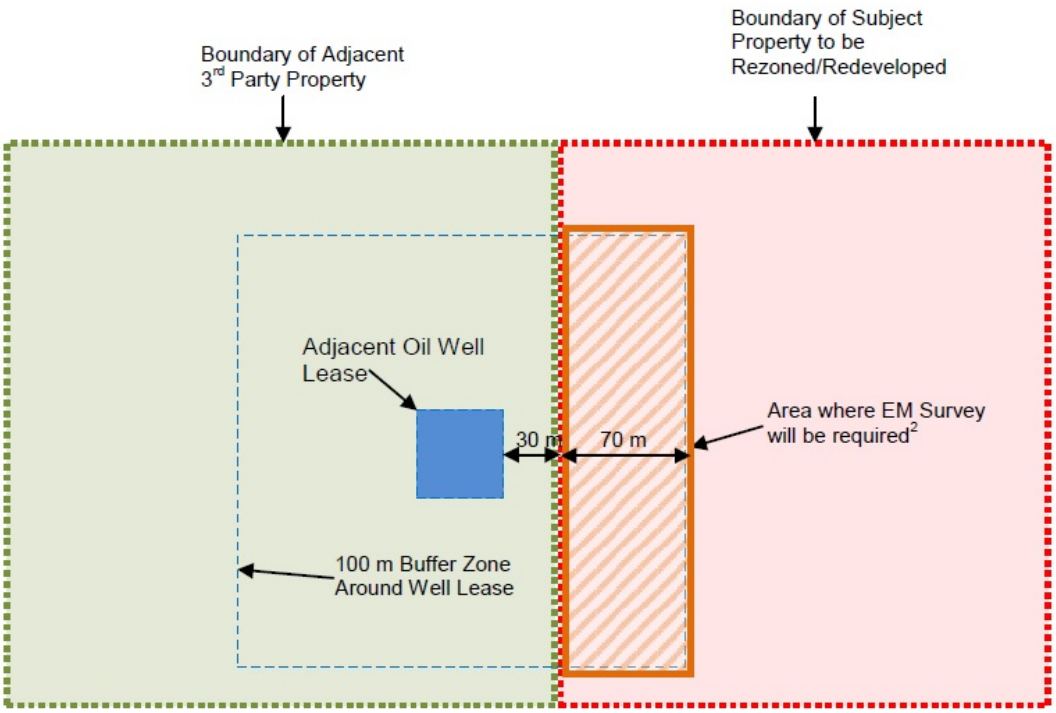
For City of Edmonton LDA applications, an EM survey is required in two situations:

1. All sites proposed for rezoning or redevelopment application that include an oil and gas wellsite lease.
2. A site application for rezoning, subdivision or development permit where an abandoned oil and gas wellsite lease is located within 100 meters of the proposed site (see Figure 1).

Please Note:

- Due to different depth exploration, both EM31 and EM38 survey methods are required.
- The EM Survey should be conducted **before** the Phase II ESA and the results of the EM survey should aid in determining investigation locations for boreholes.
- The applicant is required to ensure that colour interpretation of the EM survey data is accompanied with the EM survey results.
- Anomalies identified may require further investigation through intrusive means anomalies must be investigated whether they are high conductivity (red) or low (blue). If anomalies are discovered and it is decided not to investigate, a rational for this decision needs to be provided. If the City of Edmonton is in disagreement, further investigation may be required.
- The consultant must provide an interpretation indicating that on-site conditions are comparable to the background conditions, or that anomalies potentially related to oil and gas activity are present on the site and further investigation is needed.
- Historic oil and gas well bores that were not put into production (for example, drilled and abandoned wells) are not exempt from EM survey investigation. Any documented well bore regardless of whether it was put into production will be managed in the same manner.

In the case of a pipeline within 100 m of a property to be rezoned or redeveloped, when there is evidence of a release either visually or through available information, further investigation may be required to clarify whether the release has the potential to affect the subject property. Investigations may be focused on the area of the subject property within the 100 m of the pipeline facility. The Phase II ESA should evaluate the area near the common boundary.



NOTES: 1. Figure not to scale.
2. If anomalies are observed on the EM survey, further intrusive investigation may be required

Figure 1 – EM Survey Requirements when rezoning, subdivision or development permit applications are located next to an Adjacent Oil or Gas Well Lease

8.0 REMEDIATION AND/OR EXPOSURE CONTROL

If the Phase II ESA determines the presence of contamination, then remediation and/or Exposure Control (Phase III ESA) must be submitted to the EEC.

Remediation and exposure control measures shall meet the requirements of AEP, AHS and Transportation Services and utilize guidance as applicable from the AEP Tier 1 and Tier 2 Guidelines. The City of Edmonton must be satisfied with the investigation and information provided for sites proposing management to Tier 2 guidelines for remediation or exposure control/risk management.

9.0 DEFINITIONS

Contamination – The presence, in association with soil, water, groundwater, air, ground surface or structures or a substance or substances that may present a risk to human health or the environment where "substance" is as defined in the Alberta Environment Protection and Enhancement Act.

EM Survey – An electromagnetic (EM) survey uses the principle of induction to measure the electrical conductivity (EC) of the subsurface. EC data can be used to interpret a multitude of subsurface conditions including the locations of various buried infrastructure, tankage, major changes in stratigraphy and in some cases environmental impacts. EM surveys are widely used to complement regulatory ESAs at oil and gas related facilities. EM surveys are commonly utilized to locate subsurface contamination related to drilling sumps, flare pits and pipeline releases.

Environmental Site Assessment Repository (ESAR) – ESAR is an online searchable database that provides available scientific and technical information for properties throughout Alberta. ESAR provides access to environmental site information that has been supplied to Alberta Environment including sites with petroleum storage tanks, contaminated sites, and sites where an environmental site assessment has been done as a result of a land purchase agreement. The database can be accessed through AEP's website.

Exposure Control – Exposure Control includes site management measures designed and implemented to ensure that exposures do not result in human and ecological risks in excess of levels considered acceptable. Exposure Control may include long-term risk management options that are designed to eventually meet a Tier 1 or Tier 2 objective. Exposure Control is required when contamination exceeds AEP Tier 1 or Tier 2 Guidelines where measures to preserve the site conditions or exposure assumptions are required to obtain acceptable risk levels, or otherwise to limit exposure to acceptable levels. This includes oversight management of the property as it is brought to increasing utilization.

Greenfield Site – For the purposes of these procedures and guidelines, a Greenfield site is property in a newly developing suburban area that has AG, AGU, AGI, US, AP or PU zoning that remains in its natural state or has been used only for farming purposes and has never been occupied by a farmstead or storage tanks.

Phase I Environmental Site Assessment (ESA) – A historical evaluation of a property that is qualitative in nature and is intended to determine the likelihood of potential contamination on the property. A Phase I ESA is non-intrusive and involves no physical

testing or laboratory analysis. A Phase I ESA is to be done with regard to the Canadian Standards Association Guideline Z768-01 document, as updated or amended, with the exception of the City of Edmonton not requiring the assessment of potentially hazardous building materials like asbestos, lead paint, urea formaldehyde, and PCB's in ballasts.

Phase II Environmental Site Assessment (ESA) – An evaluation of a property through testing and analysis of soil and groundwater to determine the nature and extent of any contamination that may be present on the property. A satisfactory Phase II ESA would follow the procedure and format set by the CSA in their Guideline Z769-00, reaffirmed in 2012, as updated or amended, and shall meet the technical requirements of Alberta Environment Sustainable Resource Development, Alberta Health Services, and City of Edmonton Transportation Services Department. It would include all the steps of a Phase I ESA, if one has not already been done, to ensure that any testing or analysis of soil and groundwater is done in the right areas and for the correct substances.

Remediation - The mitigation of contamination. Remediation of a specific area is achieved once the contaminants of potential concern in the contaminated area satisfy the applicable guidelines.

Risk Management – Exposure Control – Risk Management, also called exposure control, involves meeting or exceeding provincial guidelines by managing contact between contaminants and receptors through exposure pathways (eg. Through water, soil, and/or air). This includes oversight management of the property as it is brought to increasing utilization.

Substance – As per the definition referenced in the Alberta Environmental Protection and Enhancement Act (EPEA; Chapter E-12, Section 1), a substance refers to (i) any matter that (a) is capable of becoming dispersed in the environment, or (b) is capable of becoming transformed in the environment into matter referred to in paragraph (a), (ii) any sound, vibration, heat, radiation or other form of energy, and (iii) any combination of things referred to in subclauses (i).