	PHASE II ENVIRONMENTAL SITE ASSESSMENT TERMS OF REFERENCE		
	Document: ESM – Phase II ESA	Owner: Environmental & Safety Management	Revision #: 5
	Issue Date: 2004-07-30	Approved By: Manager, Environmental Programs & Services	Last Review: 2016-11-09


REPORTING REQUIREMENTS

All Phase II Environmental Site Assessments (ESAs) undertaken for or submitted to The City of Calgary shall be completed in accordance with:


1. Canadian Standards Association CSA Z769-00 Phase II Environmental Site Assessment (CSA Standard) (2000, R2013, as amended);
2. Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines (May 2014, as amended); and,
3. Government of Alberta’s Phase 2 Environmental Site Assessment Checklist (Checklist) (May 2013, as amended).

Unless otherwise agreed to, the Phase II ESA report shall contain the sections and content listed in the “List of Required Information for a Phase 2 ESA Report”, as described in the Checklist document, with the following additional content requirements:


SECTION	CONTENT
Title Page	No additional content requirements.
Executive Summary	No additional content requirements.
Table of Contents	No additional content requirements.
Introduction	<ul style="list-style-type: none"> - Description of the objectives and scope of work. <ul style="list-style-type: none"> o Any limitations of the ESA shall be stated. o The report shall state the assessment was done in accordance to CSA Z769-00 Phase II ESA (2000, R2013, as amended) and the Government of Alberta’s Phase 2 ESA Checklist (May 2013, as amended). Any exceptions to the CSA Standard and Checklist shall be listed. o For assessments undertaken for The City of Calgary, the report shall also state the assessment was completed in accordance with The City of Calgary Phase II ESA Terms of Reference. Any exceptions to the Terms of Reference shall be listed.

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Introduction (Cont.)	<p>Deviations that result in a limited Phase II ESA that is not in accordance with the CSA Standard, Checklist and Terms of Reference will require additional work to meet the requirements of The City of Calgary’s development application process.</p> <ul style="list-style-type: none"> - Background information on site that includes: <ul style="list-style-type: none"> o Any directions from a Government of Alberta investigator or Director that apply to the site should include the Government of Alberta Reference Number. o The owner representative that authorized the environmental assessment work shall be recorded. If the assessment is undertaken for The City of Calgary then the City business unit shall be recorded only. o The qualifications of the assessors shall be recorded.
Site Characterization	<ul style="list-style-type: none"> - Regional and site characteristics: <ul style="list-style-type: none"> o List details of client’s name, the site owner, the land steward (if applicable), the legal description and the municipal address of the site. If the assessment is undertaken for The City of Calgary, the City business unit is recorded in place of a client name. o The detailed site plan, or photo mosaic or aerial photograph shall also show on-site utility services. o The site description shall include on-site utility services, surface water bodies within 300 m (include type of surface water, local surface drainage, and users), description of adjacent properties and land uses, including any buried features, the identification of water wells within a 500 m radius, and depth to usable aquifer. o When applicable, describe the 30 m buffer zone of a contaminated site of a less sensitive land use that is adjacent to a more sensitive land use. <p>Note: Numerous licensed and domestic water supply wells continue to be in use throughout the city of Calgary, despite the presence of a municipal water distribution system throughout most of the city. City of Calgary Bylaw Number 40M2006 does not prohibit the use of alternative sources of water and therefore cannot be considered an administrative control in and of itself. Adequate evidence shall be documented in the report regarding the absence of water wells in the study area, the absence of a</p>

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Site Characterization (Cont.)	<p>Domestic Use Aquifer, and confirmed service by the municipal water distribution system to support a conclusion of a non-operable groundwater ingestion pathway.</p> <ul style="list-style-type: none"> - Overview of the conceptual site model: <ul style="list-style-type: none"> o Data gaps should also be listed to determine whether additional information needs to be collected at the site. - Basis for choosing applicable site remediation guidelines. <ul style="list-style-type: none"> o A summary table demonstrating assessment of pathways and receptors should be included to support the basis for choosing applicable remediation guidelines.
Sampling and Analysis	<ul style="list-style-type: none"> - Soil Sampling: <ul style="list-style-type: none"> o Description of all field work shall include: <ul style="list-style-type: none"> o Details of the site-specific safety plan. o Rationale for drill rig selection. o Field screening and sampling methodologies for soil. o A description of how the monitoring well was installed, including the rationale for screen placement, and the well materials that were used (recorded on the borehole logs). o A description of the vertical and horizontal survey, including description of reference benchmarks. The location of the referenced benchmark shall be included in the detailed site plan. o Description of field equipment used shall include the makes and models. o Summary of samples collected shall describe the soil types in accordance with an appropriate and recognized standard. o Rationale for using selected methods shall include a description of field screening techniques for contaminants of potential concern. - Groundwater Monitoring and Sampling: <ul style="list-style-type: none"> o Description of all field work shall include: <ul style="list-style-type: none"> o Monitoring methodologies for groundwater wells. o Field screening and sampling methodologies for groundwater, including well development procedure and purging. o Hydraulic conductivity testing methodology, if completed.

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Sampling and Analysis (Cont.)	<ul style="list-style-type: none"> ○ Any deviations from the original scope of work and why those deviations occurred shall be stated (for example, no recovery, dry monitoring wells). – Free Phase Liquid Product Monitoring and Sampling (if applicable): <ul style="list-style-type: none"> ○ Description of free phase liquid product shall include its thickness before and after its removal and a general description (for example, colour, viscosity, obvious odour). – Description of QA/QC protocol: <ul style="list-style-type: none"> ○ For assessments undertaken for The City of Calgary, the description of QA/QC for the soil and groundwater samples shall include: <ul style="list-style-type: none"> ○ A minimum of one field duplicate per matrix and analyte, or one per 10 samples, whichever is greater. ○ A minimum of one equipment rinsate blank collected per day of sampling. ○ A minimum of one trip blank for BTEX or VOCs, if part of constituent sweep, per sample shipping cooler containing samples for the above analyses is required. ○ A justifiable alternative QA/QC program may be proposed by the assessor if authorized by The City of Calgary. ○ The QA/QC program used should reflect the specific Data Quality Objectives (DQOs) of the investigation (CCME 1993). Additional types of QA/QC samples may be required (US EPA 1993, US EPA 2002). ○ The completed chain-of-custody documentation shall include the full name of the sampler, the date and time each sample was collected, the date and time the samples were relinquished to the laboratory, and the temperature recorded at the laboratory.
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Sampling and Analysis (Cont.)	<ul style="list-style-type: none"> - Material Management: <ul style="list-style-type: none"> o Description of handling, storage and disposal of any materials removed from the subsurface or generated as part of the investigation is required, including but not limited to: <ul style="list-style-type: none"> o Soil drill cuttings. o Soil equipment wash water. o Free phase liquid product. o Purged groundwater. o Groundwater equipment wash water. o Monitoring well material debris.
Findings	<ul style="list-style-type: none"> - Soil Conditions and Results: <ul style="list-style-type: none"> o Description of geology of the site, including soil stratigraphy encountered on-site and grain size analyses. - Water Conditions and Results: <ul style="list-style-type: none"> o Description of hydrogeology of the site, including depth to groundwater, depth to bottom of well, results of hydraulic conductivity testing (if applicable), ground elevation, top of pipe elevation, groundwater elevation, interpreted direction of groundwater flow and gradient. - Chemistry of Free Phase Liquid Product (if applicable): <ul style="list-style-type: none"> o Summarize measurements taken as part of field screening and present results (vapour response, colour) in tabular form. - Laboratory and field QA/QC results: <ul style="list-style-type: none"> o Summarize and interpret the results of the laboratory and field QA/QC results.
Conclusions	No additional content requirements.
Record of Site Condition	No additional content requirements.

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References and Supporting Documents	<ul style="list-style-type: none"> - The following shall be appended in the report: <ul style="list-style-type: none"> o Final constituent analysis results signed by the contract laboratory and a copy of the chain of custody as submitted to laboratory. Preliminary laboratory analytical results will not be accepted in the final report. The chain of custody shall be legible and contain the full name of the sampler, the date and time sampled, the date and time relinquished to the laboratory, and the temperature of the samples upon receipt at the laboratory. o Photographs taken by assessor during site visit. The date the photographs were taken and the direction the assessor was facing shall be documented. The photographs shall be cross-referenced in the text. o Reports prepared by sub-contractors as part of Phase II ESA. o Resumes of all assessors on the signature page. o When applicable, a Reference list that details sources, reports and works cited.
Professional Sign-off	No additional content requirements.

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DOCUMENTATION REQUIREMENTS

Reports commissioned by The City of Calgary shall contain the following wording within the body:

“This report has been prepared for The City of Calgary and their agents. The City of Calgary shall at all times be entitled to fully use and rely on this report, including all attachments, drawings, and schedules, for the specific purpose for which the report was prepared, in each case notwithstanding any provision, disclaimer, or waiver in the report that reliance is not permitted.


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

- For Third Party Reports submitted to The City of Calgary as part of the development application process:
 - One complete original hard copy of final report, including all tables, figures and appendices, or complete electronic copy of final report provided in Adobe® PDF format.
- For assessments undertaken for The City of Calgary:
 - One complete copy of draft report. The draft report will only be accepted by The City of Calgary after internal senior technical review has been completed by the assessor. The City of Calgary to identify if both electronic and hard copies of draft report are required. The draft report shall be clearly labeled as ‘Draft’ (i.e., in the report title, watermarking the pages of the report and in the electronic File Name).
 - The report should also have a security classification assigned to it, in accordance with The City of Calgary’s Information Security Classification Policy (available at calgary.ca).
 - One copy (paper or electronic) of any reports obtained from others as part of the search efforts should also be provided.
 - The number of copies of the final report will be identified by The City of Calgary on a project by project basis.

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- One electronic copy of final report provided in Adobe® PDF format. If copy is provided on compact disc or digital versatile disc, the compact disc or digital versatile disc label shall be consistent with the title of the hard copy report. Electronic copies can be sent to Environment.Reports@calgary.ca.

Note: This Terms of Reference document does not replace the Environmental Protection and Enhancement Act, the Water Act, Reclamation and Remediation Regulations, the Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines or the Exposure Control Guidelines. The document does not list all provisions relating to Phase II Environmental Site Assessments. If there are differences or omissions in this document, the Acts and Guidelines apply.

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SELECTED REFERENCES

Alberta Environment. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. 2014a, as amended. AENV Publ. No. 978-0-7785-9015-6.

Alberta Environment. Alberta Tier 2 Soil and Groundwater Remediation Guidelines. 2014b, as amended. AENV Publ. No. 978-0-7785-9948-7.

Alberta Environment. Competencies for Remediation and Reclamation Advisory Committee Recommendations Report. 2006. AENV Publ. No. 978-0-7785-5470-7.

Alberta Environment and Parks. Alberta Exposure Control Guidelines. 2016. ISBN No. 978-1-4601-1489-2 (on-line edition).

Alberta Environment and Parks. Alberta Environmental Site Assessment Standard. 2016. ISBN No. 978-1-4601-0795-6 (on-line edition).

Alberta Environment and Sustainable Resource Development. Contaminated Sites Policy Framework. 2014. AENV Publ. No. 978-1-4601-0597-9.

Alberta Environment and Sustainable Resource Development. Phase 2 Environmental Site Assessment Checklist. May 2013.

Canadian Council of Ministers of the Environment. December 1993. Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites. Volume I: Main Report. Report CCME EPC-NCS62E. Winnipeg, Manitoba.



Canadian Standards Association (CSA) Group. 2000 (Reaffirmed 2013). CSA Z769-00 Phase II Environmental Site Assessment.

Government of Alberta. Conservation and Reclamation Regulation, with amendments up to and including Alberta Regulation 31/2012. Chapter 113/1993. Alberta Queen's Printer www.qp.alberta.ca.

Government of Alberta. Environmental Protection and Enhancement Act. Revised Statutes of Alberta. 2010. Alberta Queen's Printer www.qp.alberta.ca.

Government of Alberta. Remediation Certificate Regulation. Alberta Regulation 154/2009. Alberta Queen's Printer www.qp.alberta.ca.

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Government of Alberta. Water Act. Revised Statutes of Alberta 2000. Alberta Queen's Printer www.qp.alberta.ca

United States Environmental Protection Agency, Office of Research and Development. December 2002. EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5. EPA/240/R-02/009. Washington, D.C.

United States Environmental Protection Agency. September 1993. Data Quality Objectives Process for Superfund: Interim Final Guidance. EPA540-R-93-071. Washington, D.C.


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TABLE OF REVISIONS

Revision Number	Completed by	Date (yyyy/mm/dd)	Revision Description/Comments
01	C. Kehoe	2005/03/29	Updated for 2005.
02	T. Parks	2005/08/26	QA/QC Section Expanded.
03	C. Kehoe	2005/09/20	Revisions to clarify identification of buried structures and circulation of the document to others.
04	C. Kehoe	2005/09/26	Revised documentation requirements.
05	R. Calosing	2016/11/09	Added that Phase II ESAs undertaken for or submitted to The City of Calgary shall be completed in accordance with Alberta Environment and Sustainable Resource Development's Phase 2 Environmental Site Assessment Checklist (May 2013, as amended), in addition to Canadian Standards Association CSA Z769-00 Phase II Environmental Site Assessment (2000, R2013, as amended), with additional content requirements for The City of Calgary.