

# **ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM**



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DATE: October 17, 1994 . No. OF PAGES 1

MESSAGE SENT BY: Bruno Luzak

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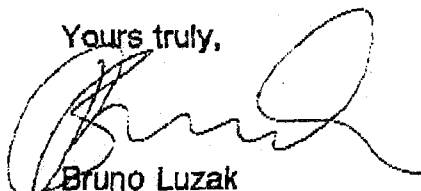
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- 1) Organizational Structure and Certification Program
- 2) Environmental Site Assessor Educational Curriculum

Yours truly,



Bruno Luzak  
President  
AESAC Inc.



## ACKNOWLEDGEMENTS

The Associated Environmental Site Assessors of Canada wishes to thank both the Canadian Mortgage and Housing Corporation and The Trust Companies Association of Canada for their continued support and funding for both the Phase I Environmental Site Assessment Certification and Educational Curriculum documents. The Associated Environmental Site Assessors of Canada would also like to thank the following individuals, for their dedication to the development of national standards for site assessors:

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## **EXECUTIVE SUMMARY**

At the request of the Associated Environmental Site Assessors of Canada Inc. (AESAC), **GLOBALTOX INTERNATIONAL CONSULTANTS INC.** has prepared a set of two documents to assist AESAC in developing a certification and training program for environmental site assessors. These two documents are complimentary and together present a progressive plan to guide AESAC into its role as the training and accreditation body for environmental site assessors in Canada.

The second of these two documents is this *Educational Curriculum*. It focuses on the training aspect of AESAC's role in the accreditation of environmental site assessors. A description of the tasks required to complete a Phase I Environmental Site Assessment (ESA) according to the standard of practice recently released by the Canadian Standards Association (CSA) is presented as a starting point. A list of the skills and knowledge required by a qualified environmental site assessor has been drawn up, based on the CSA Standard.

Based on this description of tasks and skills, **GLOBALTOX** has recommended, a list of topics which should be included in an AESAC training program. These topics have been arranged into suggested modules for presentation by AESAC as half or full day courses. The completion of this training would ensure that AESAC-certified individuals possess a high level of competence in the performance of Phase I ESAs according to the CSA Standard.

There are a number of guidelines and standards other than the CSA Standard which describe the execution of environmental site inspections. A review of the differences between these standards and the CSA Standard has been prepared. Based on this review, **GLOBALTOX** has recommended that AESAC develop a series of supplemental training courses to enable its environmental site assessors to perform these other types of site inspections to their prescribed standards of competence.

**EXPERT EN ÉVALUATION ENVIRONNEMENTALE  
DE SITES  
PLAN D'ÉTUDES**

**PROGRAMME D'ACCREDITATION ET  
DE FORMATION DE L'AESAC**

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**RÉSUMÉ**

À la demande de l'organisme Associated Environmental Site Assessors of Canada Inc. (AESAC), la société **GlobalTox International Consultants Inc.** a produit deux documents en vue d'aider l'AESAC à mettre au point un programme d'accréditation et de formation pour les experts en évaluation environnementale de sites. Ces deux documents complémentaires constituent un plan progressif devant permettre à l'AESAC d'assumer son rôle à titre d'organisme d'accréditation et de formation pour les experts en évaluation environnementale de sites au Canada.

Le second des deux documents, un plan d'études, traite du rôle de formation que jouera l'AESAC dans l'accréditation des experts en évaluation environnementale. On y présente d'abord la description des tâches requises pour effectuer la phase 1 d'une étude environnementale, conformément aux normes de l'Association canadienne de normalisation (CSA), puis la liste des compétences et des connaissances que doit posséder l'expert par rapport aux normes de la CSA.

En se fondant sur la description des tâches et des compétences, la firme **GlobalTox** recommande une liste de sujets devant figurer dans le programme de formation de l'AESAC. Ces sujets ont été regroupés par modules pouvant être présentés dans le cadre de séances de formation d'une journée ou d'une demi-journée. Au terme de cette formation, les experts accrédités par l'AESAC posséderont toutes les aptitudes requises pour réaliser la phase 1 des études environnementales des sites conformément aux normes de la CSA.

Il existe d'autres normes et lignes de conduite, outre celles de la CSA, pour réaliser la phase 1 de l'étude environnementale. L'examen des divergences entre ces normes et celles de la CSA a été réalisé. En fonction de cette comparaison, la firme **GlobalTox** recommande que l'AESAC mette au point une série de cours supplémentaires afin que les experts en évaluation environnementale puissent effectuer des études conformément aux autres normes établies.



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## I. INTRODUCTION

GLOBALTOX INTERNATIONAL CONSULTANTS INC. was contracted by the Association of Environmental Assessors of Canada (AESAC) to prepare a set of two documents to assist AESAC in developing a certification and training program for environmental site assessors. One of these two documents, this *Educational Curriculum* is a proposal to meet the training needs outlined in the companion *Discussion Paper*. These two documents are complimentary and together present a progressive plan to guide AESAC into its role as the training and accreditation body for environmental site assessors in Canada.

In April 1994, the Canadian Standards Association (CSA) (1994b) released Standard Z768-94 (hereafter referred to as the CSA Standard) for the performance of Phase I Environmental Site Assessments (ESAs). This Standard sets out the issues and tasks which must be considered and completed during a Phase I ESA.

As discussed in the *Discussion Paper*, GLOBALTOX recommends that an environmental site assessor demonstrate a combination of general technical knowledge about environmental contamination, experience in recognizing environmental hazards and pollution, and training in the specific requirements of the CSA Standard, in order to carry out a Phase I ESA properly.

This *Educational Curriculum* focuses its attention on the training aspect of these requirements. It details the training program recommended by GLOBALTOX for those wishing to become AESAC-certified environmental site assessors. This training would help to ensure that these individuals are competent to perform Phase I ESAs according to the CSA Standard.

There are a number of guidelines and standards other than the CSA Standard which describe the execution of an environmental site inspection. Their requirements are different in some areas than those of the CSA Standard. A review of these differences has been prepared. Based on these, GLOBALTOX has recommended the development of a series of supplemental training courses to enable AESAC-certified environmental site assessors to perform these other environmental site assessment practices.

## **II. TASKS, SKILLS, AND TRAINING REQUIRED UNDER THE CSA STANDARD**

### **II.A. TASKS, SKILLS, AND TRAINING FOR THE PRACTICE OF A PHASE I ESA<sup>1</sup>**

The CSA Standard for Phase I Environmental Site Assessments is a document which details the many tasks and responsibilities involved in executing a Phase I ESA. It is intended to be applicable to the wide range of sites that require environmental site assessment. For this reason there are a number of tasks included in it that may not apply to a given site. The CSA Standard is designed to be a minimum standard of practice which can be enhanced by the addition of, for example, an optional records search {see section 7.3}. It is left to the discretion of the environmental site assessor and the client to decide which addition tasks may be needed. However, this should be done only after careful consideration, as any contamination missed due to such a decision may prove a grave liability.

The full list of tasks, with references to the appropriate sections of the Standard, can be found in the first column of Table 1. This list is divided into five subheadings that are the major activities undertaken during a Phase I ESA.

With this list of tasks as a basis, and the aid of the description included in the CSA Standard, a list of skills necessary to complete a Phase I ESA has been drawn up. All of these skills should be possessed by any individual who performs a Phase I ESA. This list of necessary skills makes up the second column of Table 1.

The third column of Table 1 is a list of subjects and issues that should be included in an AESAC training program intended to prepare its students to perform Phase I ESAs. This list corresponds directly to the lists of skills and tasks on which it is based, and forms the core of the proposed AESAC training curriculum.

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<sup>1</sup>Canadian Standards Association 1994b

# A CERTIFICATION AND TRAINING PROGRAM FOR AESAC

## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

**TABLE 1. THE TASKS, SKILLS, AND TRAINING FOR A PHASE I ESA ACCORDING TO THE CSA STANDARD.**

{ } indicates reference to section of CSA Standard

TASKS		SKILLS	TRAINING
<b>GENERAL TASKS {see 3.1 – 5.7}, SKILLS AND TRAINING NECESSARY</b>			
1.	<ul style="list-style-type: none"> <li>·Ensure objectivity and independence. {see 3.2}</li> <li>·Ensure freedom from any conflict of interest. {see 3.3}</li> <li>·Inform client of any duties or obligations under professional organizations. {see 3.5}</li> </ul>	<ul style="list-style-type: none"> <li>·Understand importance of objectivity and independence.</li> <li>·Know Conflict of Interest Guidelines.</li> <li>·Recognize impact of professional duties and obligations on maintenance of objectivity and client confidentiality.</li> </ul>	<ul style="list-style-type: none"> <li>·general ethics of environmental site assessment</li> <li>·concepts of third party objectivity and conflict of interest guidelines</li> <li>·methods of assuring and proving objectivity, independence, and confidentiality</li> <li>·general scope of a Phase I ESA</li> </ul>
2.	<ul style="list-style-type: none"> <li>·Convince client of environmental site assessor's competence to complete the Phase I ESA. {see 3.4}</li> </ul>	<ul style="list-style-type: none"> <li>·Familiarity with applicable federal, provincial/territorial, and local legislation and published guidelines.</li> <li>·Practical application of regulatory limits set.</li> <li>·Knowledge of relevant technical areas.</li> </ul>	<ul style="list-style-type: none"> <li>·applicable legislation and its impact on Phase I ESAs</li> <li>·technical information about situations commonly encountered on site</li> </ul>

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## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
<b>SPECIFIC TASKS {see 6-10}, AND THE SKILLS AND TRAINING REQUIRED</b>			
1.	<b>GENERAL PRACTICES {see 6}</b> ·Agree with client as to Scope of Work {see 6.3} which is to include: a. party for whom Phase I ESA is to be performed, b. subject property, c. activities to be undertaken, from list in Standard, including an outline of the appropriate search distances for the Record Review {see 7.1.4}, d. any enhancements to list of activities in Standard .	·By nature of site, be able to estimate and justify projection of appropriate level and scope of Phase I ESA to be applied.  ·Be able to set search distances.  ·Know which tasks are considered as part of the Standard and which are considered extensions.	·differences in cost vs. thoroughness of various levels and scopes of Phase I ESAs  ·deciding on appropriate search distances  ·which tasks are considered part of the Standard and which are considered extensions

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## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
	<ul style="list-style-type: none"> <li>·Agree with client on terms of reference for the Phase I ESA including:               <ul style="list-style-type: none"> <li>a. conducting the Phase I ESA with care, diligence, and good judgement {see 3.5},</li> <li>b. using standard methods {see 3.6}</li> <li>c. the inherent limitations and associated uncertainty of the Phase I ESA {see 3.8 and 4.2.2},</li> <li>d. identifying the uses of the Phase I ESA {see 4.1},</li> <li>e. the proper interpretation of the Phase I ESA results {see 4.2},</li> <li>f. the assistance to be supplied to the environmental site assessor {see 5},</li> <li>g. verifying information or data collected {see 6.4}.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>·Knowledge of "due care" and "due diligence" expectations and of standardized methodologies.</li> <li>·Understand the inherent limitations of the Standard and of Phase I ESAs.</li> <li>·Know the uses of Phase I ESA results.</li> <li>·Know how to properly interpret Phase I ESA results.</li> <li>·Know what assistance the environmental site assessor can expect.</li> <li>·Understand when and how to do verification and its importance.</li> </ul>	<ul style="list-style-type: none"> <li>·concepts of "due care", "due diligence", and its practical implications</li> <li>·systematic procedures for obtaining, evaluating, and presenting information</li> <li>·inherent limitations of the Phase I ESA and the implications of these to the environmental site assessor</li> <li>·various uses of Phase I ESA results</li> <li>·proper interpretation of Phase I ESA results</li> <li>·assistance required by the environmental site assessor</li> <li>·verification practices</li> </ul>

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## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
2.	<p>RECORDS REVIEW {see 7}</p> <ul style="list-style-type: none"> <li>·Document each source of information correctly. {see 7.1.2}</li> <li>·<u>Mandatory Records Review</u> {see 7.2}:               <ol style="list-style-type: none"> <li>a. Review aerial photographs for historic and general land usage.</li> <li>b. Inspect property use records eg. insurance records and property-use directories, for indicators of potential contamination.</li> <li>c. Search title and assessment rolls to get chronology of ownership.</li> <li>d. Study previous Phase 1 ESAs that are considered reasonable and thorough in order to avoid replication.</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>·Know rights under Freedom of Information Act.</li> <li>·Be able to properly reference.</li> <li>·Be familiar with various techniques of searching.</li> <li>·Know how to obtain and evaluate aerial photographs.</li> <li>·Know how to get and what to look for in the various kinds of property records.</li> <li>·Know how to search for and read titles and assessments.</li> <li>·Understand and be able to apply the criteria for judging the value of a previous Phase I ESA.</li> </ul>	<ul style="list-style-type: none"> <li>·rights under the Freedom of Information of Act</li> <li>·proper referencing practices</li> <li>·searching techniques</li> <li>·where aerial photographs can be found and how to evaluate them</li> <li>·how to access and read different kinds of property records</li> <li>·how to search for and read titles and assessments</li> <li>·evaluating previous Phase I ESAs</li> </ul>

## A CERTIFICATION AND TRAINING PROGRAM FOR AESAC

## *ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM*

	TASKS	SKILLS	TRAINING
	<p>e. Examine company records {see 7.2.5 for a partial list} for commercial and industrial properties.</p> <p>f. Review geological and geotechnical reports pertaining to the environmental condition of the subject property.</p> <p>g. Obtain regulatory information from agencies or commercial services about permits, prosecutions, work orders, violations, etc. pertaining to the site.</p>	<p>·Be able to acquire, read and interpret the contents of typical company records.</p> <p>·Be able to obtain and comprehend the information contained in geological and geotechnical reports.</p> <p>·Know how to access and read the various regulatory documents that are likely to be encountered.</p>	<p>·typical company record formats and how to access and interpret them</p> <p>·possible suppliers of geological and geotechnical reports and how to use them as information sources</p> <p>·regulatory documents, how to interpret them, and sources from which they can be obtained</p>

## A CERTIFICATION AND TRAINING PROGRAM FOR AESAC

## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
	<p>·<u>Optional Records Review</u> {see 7.3}</p> <p>a. Procure and review geological and soil maps for environmental conditions.</p> <p>b. Compare topographical maps from the past and present to identify areas of fill.</p> <p>c. Review Agreements of Purchase and Sale for any contamination-related clauses.</p> <p>d. Search documents of municipal land use and engineering departments for valuable information about the property.</p>	<p>·Know how to obtain geological and soil maps, what information they contain, and its usefulness.</p> <p>·Understand the scaling and material of topographic maps and know where to obtain them.</p> <p>·Be able to find, read, and comprehend Agreements of Purchase and Sale.</p> <p>·Know what information can be gathered from land use documents and how to access them.</p>	<p>·how to access and use geological and soil maps</p> <p>·how to obtain and read topographic maps</p> <p>·how to find, read, and comprehend Agreements of Purchase and Sale</p> <p>·how to obtain information from various land use documents</p>



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## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
	<ul style="list-style-type: none"><li>e. Look into any public health concerns about the property.</li><li>f. Contact utility companies to verify the presence of utility distribution facilities.</li><li>g. Access any available local sources for historical information about the site.</li><li>h. Consult any other source of information that may offer additional useful information. {see 7.4 for partial list}.</li></ul>	<ul style="list-style-type: none"><li>·Know how to contact local and other public health officials.</li><li>·Know how to obtain information from utility companies to verify the presence of distribution facilities.</li><li>·Know how to access local sources for historical information and the resources that each can supply.</li><li>·Be aware of possible sources of information on a variety of contamination/environmental issues for consultation upon need.</li></ul>	<ul style="list-style-type: none"><li>·information available from public health sources and how to access it</li><li>·obtaining information from utility companies about their facilities</li><li>·the range of local information sources and tapping them for historical information</li><li>·additional sources of information that could be of use</li></ul>

# A CERTIFICATION AND TRAINING PROGRAM FOR AESAC

## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
3.	<p>SITE VISIT {see 8}</p> <p>·General: {see 8.1}</p> <p>a. Ensure that the health and safety of the environmental site assessor is considered during the Site Visit. {see 8.1.1}</p> <p>b. Record the methodology and limitations of the visit. {see 8.1.3 – 8.1.4}</p> <p>c. Observe current, or evidence of past, uses of the site and of adjacent properties. {see 8.1.5}</p> <p>d. Inventory quantities, types, and storage conditions of hazardous and unidentified substances. {see 8.1.6 – 8.1.7}</p>	<p>·Know the potential safety and health hazards posed by a site and how to be protected from them.</p> <p>·Know how to document methodology and limitations</p> <p>·Understand the various uses of property, the contaminants they produce, and common indicators of the presence of these contaminants.</p> <p>·Be able to recognize indicators of contamination and document the characteristics of actual or suspected contamination.</p>	<p>·safety hazards and precautions during site visits</p> <p>·documenting methodology and limitations</p> <p>·land uses, typical contaminants produced, and their identification</p> <p>·environmental effects of contaminants, indicators of these, and documentation of actual and suspected contamination</p>

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## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
	<p>e. Identify and describe details of present or evidence of past storage tanks and containers including: age, size, location, contents, condition, etc. {see 8.1.8 – 8.1.9}</p> <p>f. Identify and describe the nature and possible source of any odours on the site. {see 8.1.10}</p> <p>g. Identify and describe the sources of potable water for the property. {see 8.1.11}</p> <p>h. Identify the likely presence of substances such as PCBs, ACMs, lead, ODSs, and UFFI. {see 8.1.12}</p>	<p>·Be able to identify all forms of storage containers or evidence of their presence and document information about them.</p> <p>·Be able to trace the possible origin of any odour that may be encountered.</p> <p>·Know how to identify and describe the sources of potable water for the site.</p> <p>·Appreciate the danger posed by certain classes of contaminants and be able to document the presence of any of these on the site.</p>	<p>·methods of production/transport/storage/disposal of contaminants</p> <p>·identification and description of storage containers</p> <p>·odours and tracing their origins</p> <p>·potable water sources and systems</p> <p>·details of contaminants such as PCBs, asbestos, lead, ODSs and UFFI, and common indicators of their presence</p>

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	TASKS	SKILLS	TRAINING
	<p>·<u>Interior</u>: {see 8.2}</p> <p>a. Inspect the interior of structures for evidence of contamination. {see 8.2.1}</p> <p>b. Identify and describe fuel sources and waste products of heating/cooling systems. {see 8.2.2}</p> <p>c. Identify and describe the characteristics, possible source, and potential for migration of contaminants of and from any visible stains. {see 8.2.3}</p> <p>d. Note the location and condition of floor drains and sumps that show evidence of contamination. {see 8.2.4}</p>	<p>·Appreciate the general architecture and engineering of structures and common indications of contamination.</p> <p>·Understand how heating/cooling systems work and what contamination can be caused by their use.</p> <p>·Be able to discern and document stains on any interior surface, and the potential for their migration.</p> <p>·Know what floor drains and sumps look like and how to describe any indications of contamination.</p>	<p>·architecture and engineering, and indicators of contamination</p> <p>·heating/cooling systems and how they can cause contamination</p> <p>·identifying and describing stains and the potential for migration of contaminants</p> <p>·how to describe contamination of floor drains and sumps</p>

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	TASKS	SKILLS	TRAINING
	<p>·<u>Exterior</u>: {see 8.3}</p> <p>a. Inspect exterior structures and grounds of the site and adjoining properties for indications of contamination. {see 8.3.1 – 8.3.2}</p> <p>b. Observe and note the topographic, geologic and hydrogeologic conditions of the site. {see 8.3.3}</p> <p>c. Observe and describe the structures on the property. {see 8.3.4}</p> <p>d. Identify and describe all abandoned and existing wells. {see 8.3.5}</p> <p>e. Identify and describe the methods of sewage disposal present on the site. {see 8.3.6}</p>	<p>·Appreciate what the exterior of structures and the surrounding grounds should look like and be able to inspect and describe any signs of contamination.</p> <p>·Know what constitutes topographic, geologic, and hydrogeologic conditions and how to describe them.</p> <p>·Be able to document the characteristics of the property's structures.</p> <p>·Be able to identify and describe any abandoned and existing wells.</p> <p>·Know about sewage systems, what indications there might be of contamination from these, and how to document them.</p>	<p>·exterior appearances of structures and grounds, their contamination, and its documentation</p> <p>·describing topographic, geologic, and hydrogeologic conditions</p> <p>·characterizing exterior structures</p> <p>·how to identify and describe abandoned and existing wells</p> <p>·sewage systems, their contamination, and description</p>

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## ENVIRONMENTAL SITE ASSESSOR EDUCATIONAL CURRICULUM

	TASKS	SKILLS	TRAINING
	<p>f. Identify and describe any artificial pits and lagoons on the property and on the adjoining properties. {see 8.3.7}</p> <p>g. Identify and describe any stained materials present. {see 8.3.8}</p> <p>h. Identify and describe the location and extent of stressed vegetation on the site. {see 8.3.9}</p> <p>i. Identify and describe any areas that appear to have been artificially filled or graded. {see 8.3.10}</p> <p>j. Identify and describe any wastewater or liquid discharge from the site or its facilities. {see 8.3.11}</p>	<p>·Know how to identify and describe artificial pits and lagoons.</p> <p>·Be able to recognize and describe stained materials.</p> <p>·Be able to perceive the signs of stressed vegetation and to document the location and extent of such.</p> <p>·Recognize areas of unnatural fill and grading, and be able to describe these.</p> <p>·Be able to identify and describe any wastewater or other liquid discharge that is present on the property.</p>	<p>·how to identify and describe artificial pits and lagoons</p> <p>·how to recognize and describe stained materials</p> <p>·how to perceive signs of stressed vegetation and the documentation of such</p> <p>·how to recognize and describe areas of unnatural fill and grading</p> <p>·the identification of wastewater or other liquid discharges and their description</p>

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	TASKS	SKILLS	TRAINING
	k. Identify and describe and watercourses, ditches, or standing water on the property. {see 8.3.12} l. Identify any public thoroughfares crossing or bordering the property. {see 8.3.13}	·Be able to characterize any surface water features on the site. ·Be able to identify any public thoroughfares that cross or border the property.	·how to characterize surface water features of the property ·identifying public thoroughfares that cross or border the property
4.	INTERVIEWS {see 9} ·Decide who should be interviewed including site personnel, third parties, and government officials. {see 9.5} ·Decide what questions should be asked of whom and what the limits of complete answers are. {see 9.2 and 9.4} ·Decide when and by what media the interviews should be conducted. {see 9.3} ·Conduct the interviews.	·Know who might have useful information to be communicated during an interview. ·Know how to conduct effective interviews including appropriate questions and timing. ·Be aware of limits that affiliations may place on some people's ability or willingness to talk openly eg. confidentiality issues.	·the types of information that various kinds of interviewees may be able to provide ·various interviewing techniques and skills ·issues of confidentiality and loyalty to ones employer that may prevent a successful interview ·advantages and disadvantages of various choices of timing of interviews

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	TASKS	SKILLS	TRAINING
5.	<p>EVALUATION AND REPORTING {see 10}</p> <p>·Assimilate and evaluate all information, data, and observations from the Records Review, Site Visit, and Interviews in such a way as to:</p> <ol style="list-style-type: none"> <li>distinguish fact from opinion</li> <li>identify actual and potential contamination and the basis for such findings</li> <li>indicate the relative degree of uncertainty of the findings</li> </ol> <p>{see 10.1}</p>	<p>·Know how to assimilate and evaluate all of gathered information.</p> <p>·Be able to separate fact from opinion.</p> <p>·Be able to identify actual and potential contamination and properly support these findings.</p> <p>·Understand the uncertainties associated with Phase I ESAs.</p>	<p>·assimilating and evaluating all kinds of gathered information</p> <p>·differentiating fact from opinion and including both in the report</p> <p>·deriving findings from gathered information and supporting these</p> <p>·uncertainties associated with Phase I ESAs</p>



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	TASKS	SKILLS	TRAINING
	<p>·Report the findings according to the recommended format {see 10.2.1} such that the report:</p> <ul style="list-style-type: none"> <li>a. is complete and can stand alone {see 10.2.2}</li> <li>b. includes all findings {see 10.2.3}</li> <li>c. displays adherence to the Standard {see 10.2.4}</li> <li>d. describes limiting conditions restricting the Phase I ESA {see 10.2.5}</li> <li>e. describes the environmental site assessor–client relationship {see 10.2.6}</li> <li>f. describes any enhancements to the Standard included in the Phase I ESA (see 10.2.7)</li> </ul>	<p>·Be able to write and present a report according to the given format which includes the complete findings and supporting information, and which can stand alone.</p> <p>·Know how to present evidence of adherence to the Standard except where limiting conditions existed, in which case how an explanation should be given.</p> <p>·Be able to describe the environmental site assessor–client relationship.</p> <p>·Be able to provide a description of any enhancements to the Standard which were carried out.</p>	<p>·expected format of report and presentation</p> <p>·how to include the complete findings and their basis in the report and executive summary</p> <p>·presenting evidence of adherence to the Standard and/or explanation of limiting conditions</p> <p>·describing the environmental site assessor–client relationship</p> <p>·reporting enhancements to the Standard that were implemented</p>

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	TASKS	SKILLS	TRAINING
	<p>g. states clearly the conclusions of the environmental site assessor and the basis for these in the factual findings of the Phase I ESA {see 10.2.8}</p> <p>h. names all participants involved in the assessment {see 10.2.9}</p> <p>i. contains evidence of the assessors' qualifications {see 10.2.10}</p> <p>j. includes documentation and references to support findings and conclusions (see 10.2.11)</p>	<p>·Know how to draw and report reasonable conclusions based on the findings of the Phase I ESA.</p> <p>·Be able to identify all people involved in the assessment and their qualifications.</p> <p>·Know how to reference and supply supporting documentation for all findings.</p>	<p>·reaching and reporting the conclusions drawn from the gathered information</p> <p>·acknowledging and accrediting assessors</p> <p>·referencing and presenting supporting documentation for all findings</p>

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### **II.B. MODULES OF A CURRICULUM FOR TRAINING IN THE PERFORMANCE OF PHASE I ENVIRONMENTAL SITE ASSESSMENTS**

The third column of Table 1 gives a detailed list of the subjects that need to be covered in a educational program intended to train individuals to perform Phase I ESAs according to the CSA Standard. In this section, the required training subjects have been organized under general subject headings. These groupings are suggested as possible training modules and are presented in sections II.B.1–II.B.6. Where directly applicable, references to sections of the CSA Standard have been made in parentheses {}.

1. Environmental Site Assessments in General
2. Legal Issues, Ethics, and Systematic Methodology
3. Technical Training and Information
4. Records Review Training
5. Site Visit Skills
6. Client Relations and Communication Skills

The completion of each of these modules would be mandatory before the student would be eligible to write the certification examination. A more detailed explanation of the proposed process for accreditation is given in the accompanying *Discussion Paper*.

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### **II.B.1. Environmental Site Assessments in General** **(Half-day introductory course)**

- purpose of course
- definition of environmental site assessment and its distinction from environmental auditing {2}
- the history of environmental site assessments in Canada and the different provinces
- legislation and standards governing the implementation of Phase I ESAs {3.4}
- the role of environmental site assessors
- various uses of Phase I ESA results {4.1}
- differences in cost vs. thoroughness of various levels and scopes of Phase I ESAs {6.3}
- uncertainties associated with Phase I ESAs
- establishing an appropriate environmental site assessor-client relationship
- expectations of tasks to be undertaken as part of Phase I ESA
- expected format of report and presentation

### **II.B.2. Legal Issues, Ethics, and Systematic Methodology** **(Half-day upgrading course for practitioners)**

- purpose of course
- general ethics of Phase I ESAs {3.2, 3.3, 3.5}
- concepts of third party objectivity and conflict of interest guidelines {3.2, 3.3}
- methods of assuring and proving objectivity, independence, and confidentiality {3.2, 3.3, 3.5}
- various uses and proper interpretation of Phase I ESA results {4.1, 4.2}
- comparison of applicable legislation in various jurisdictions and its impact on Phase I ESAs {3.4}
- concepts of "due care" and "due diligence" and their practical implications {3.5}
- which tasks are considered part of the Standard and which are considered extensions {6.3}
- systematic and appropriate procedures for obtaining, evaluating, and presenting information {3.5}
- safety hazards and precautions during site visits
- kinds of assistance required by the environmental site assessor {5}
- rights under the Freedom of Information of Act {7}
- inherent limitations of the Phase I ESA and the implications of these to the environmental site assessor {3.8, 4.2.2}
- uncertainties associated with Phase I ESAs
- verification practices {6.4}

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### II.B.3. General Training and Information (One day course)

#### General

- Purpose of course
- technical information about situations commonly encountered on site {3.4}
- deciding on appropriate search distances {7.1.4}
- safety hazards and precautions during site visits {8.1.1}
- land uses and the typical contaminants they produce {8.1.5}
- environmental effects of contaminants {8.1.6, 8.1.7}
- architecture and engineering and indicators of contamination {8.2.1}
- exterior appearances of structures and grounds and signs of their contamination {8.3.1, 8.3.2}

#### Specific

- origins of common commercial, industrial and natural odours {8.1.10}
- potable water sources and systems {8.1.11}
- methods of production/transport/storage/disposal of contaminants {8.1.8, 8.1.9}
- various kinds of storage containers as sources of contamination {8.1.8, 8.1.9}
- details of contaminants such as PCBs, asbestos, lead, ODSs and UFFI {8.1.12}
- heating/cooling systems and how they can cause contamination {8.2.2}
- floor drains and sumps {8.2.4}
- topographic, geologic, and hydrogeologic conditions and how they are affected by contamination {8.3.3}
- sewage systems as sources of contamination {8.3.6}
- the uses and abuses of artificial pits and lagoons {8.3.7}
- how vegetation is stressed by pollutants and the signs they show {8.3.9}
- the purpose of unnatural fill and grading practices {8.3.10}
- typical wastewater and other liquid discharges {8.3.11}
- various surface water features and their contamination {8.3.12}

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### II.B.4. Records Review Training (One day course)

#### General

- purpose of course
- rights under the Freedom of Information of Act {7}
- proper referencing practices {7.1.2}
- searching techniques {7.1.2}

#### Technical Documents

- possible suppliers of geological and geotechnical reports and how to use them as information sources {7.2}
- how to access and use geological and soil maps {7.3}
- how to obtain and read topographic maps {7.3}
- where aerial photographs can be found and how to evaluate them {7.2}

#### Administrative and Legal Documents

- typical company record formats and how to access and interpret them {7.2.5}
- regulatory documents, how to interpret them, and sources from which they can be obtained {7.2}
- how to find, read and comprehend Agreements of Purchase and Sale {7.3}
- how to access and read different kinds of property records {7.2}
- how to search for and read titles and assessments {7.2}
- obtaining information from utility companies about their facilities {7.3}

#### Miscellaneous Reports, Documents, and Data Bases

- evaluating previous Phase I ESAs {7.2}
- how to obtain and get information from various land use documents {7.3}
- what information might be obtained from public health sources and how to access these {7.3}
- the range of local information sources and tapping them for historical information {7.3}
- additional sources of information that could be of use {7.3}
- accessing computer databases

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### II.B.5. Site Visit Skills

(One day course)

#### General

- purpose of course
- safety hazards and precautions during site visits {8.1.1}
- identification and description of storage containers {8.1.8, 8.1.9}
- tracing the origins of odours {8.1.10}
- identifying potable water sources {8.1.11}
- the identification of contaminants released by common land uses {8.1.5}
- indicators of the environmental effects of contaminants and documentation of actual and suspected contamination {8.1.6, 8.1.7}
- common indicators of the presence of PCBs, asbestos, lead, ODSs, UFFI and other specific classes of substances {8.1.12}

#### Interior

- inspecting architecture and engineering of structures for indicators of contamination {8.2.1}
- inspecting heating/cooling systems for contamination {8.2.2}
- identifying and describing stains and potential for the migration of contaminants {8.2.3}
- how to describe contamination of floor drains and sumps {8.2.4}

#### Exterior

- documentation of signs of contamination of the exteriors of structures and grounds {8.3.1, 8.3.2}
- describing topographic, geologic, and hydrogeologic conditions {8.3.3}
- characterizing exterior structures {8.3.4}
- how to identify and describe abandoned and existing wells {8.3.5}
- description of contamination caused by sewage systems {8.3.6}
- how to identify and describe artificial pits and lagoons {8.3.7}
- how to recognize and describe stained materials {8.3.8}
- how to perceive signs of stressed vegetation and the documentation of such {8.3.9}
- how to recognize and describe areas of unnatural fill and grading {8.3.10}
- the identification of wastewater or other liquid discharges and their description {8.3.11}
- how to characterize surface water features of the property {8.3.12}
- identifying public thoroughfares that cross or border the property {8.3.13}

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### II.B.6. Client Relations and Communications Skills (One day course)

·purpose of course

#### Interviewing (half-day)

- the purpose of interviews and their usefulness {9.1}
- posing pertinent questions based on the Records Review and Site Visit {9.2}
- interviewing in person, by telephone, and in writing {9.3}
- timing of interviews {9.3}
- the types of information that various kinds of interviewees may be able to provide {9.5}
- various interviewing techniques and skills {9.2, 9.4}
- the limitations of interviews {9.4}
- choosing interviewees: site personnel, third parties, government officials {9.5}
- issues of confidentiality and loyalty to ones employer that may prevent a successful interview
- preparation for and follow-up after interviews
- quoting and reporting the information gathered from interviews

#### Client Relations and Reporting (half-day)

- establishing an appropriate environmental site assessor-client relationship
- understanding potential client needs, policies, and procedures of often-encountered clients such as the Canadian Mortgage and Housing Corporation, the Trust Companies Association of Canada, etc.
- differences in cost vs. thoroughness of various levels and scopes of Phase I ESAs {6.3}
- constructing terms of reference : which tasks are considered extensions of the CSA Standard {6.3}, setting appropriate search distances {7.1.4}, defining the assistance required by the environmental site assessor {5}, specifying the expected format of report and presentation {10.2.1}
- proper interpretation of Phase I ESA results {4.2} and their associated uncertainties {10.1}
- assimilating, evaluating, and deriving findings from all of the gathered information {10}
- differentiating fact from opinion and including both in the report {10.1}
- how to include the complete findings and their basis in the report {10.2.2, 10.2.3, 10.2.8, 10.2.11}
- presenting evidence of adherence to the Standard and/or explanation of limiting conditions {10.2.5}
- describing the environmental site assessor-client relationship {10.2.6}
- reporting enhancements to the Standard that were implemented {10.2.7}
- acknowledging and accrediting environmental site assessors {10.2.9, 10.2.10}



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### **III. TASKS, SKILLS, AND TRAINING REQUIRED UNDER STANDARDS OF PRACTICE OTHER THAN THE CSA STANDARD**

The training curriculum proposed for AESAC is based solely on the requirements of CSA Standard Z798-93. AESAC-certified environmental site assessors may be over-qualified or under-qualified to perform Environmental Site Assessments (ESAs) done according to a standard or guideline other than that of the CSA.

The areas of the requirements of these other Standards in which an AESAC-trained environmental site assessor would be under- or over-qualified have been summarized in the following sections. GLOBALTOX has used these comparisons to make recommendations for the provision of supplemental courses by AESAC to train its members in these areas.

#### **III.A. THE AMERICAN SOCIETY FOR TESTING AND MATERIALS STANDARD (E1527) FOR PHASE I ENVIRONMENTAL SITE ASSESSMENTS<sup>1</sup>**

##### **III.A.1. Overview**

The American Society for Testing and Materials recently published a standard for Phase I environmental site assessments. Its main focus is ensure freedom of liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

With the recent trend towards the harmonization of international standards, it is important that the requirements under these two Standards be compared. AESAC-certified environmental site assessors may well find themselves having to comply with the ASTM Standard. In order to identify the areas of weakness for an AESAC-trained environmental site assessor working under the American Standard, Table 2 is a summary of the differences between the CSA and ASTM Standards.

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<sup>1</sup> American Society for Testing and Materials 1993a

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**TABLE 2. DIFFERENCES IN REQUIREMENTS BETWEEN CSA STANDARD AND THE  
ASTM STANDARD**

	CSA Standard	ASTM Standard
1.	Standard developed to help clients make informed decisions about potentially contaminated sites by reducing uncertainty about potential environmental liabilities and to be a basis for further investigation of the property. {see 1.1}	Standard developed to permit a user to satisfy one of the requirements to qualify for the <i>innocent landowner defense</i> to CERCLA liability. [see 1.1]
2.	Phase I ESA is intended to be the first step in the process of environmental site assessment and remediation of a property. {see 1.1}	Both the ASTM-defined-Phase I ESAs and Transaction Screen Processes <sup>1</sup> are considered practices suitable to meet the <i>innocent landowner defense</i> [see 4.3] but a Transaction Screen that shows a need for further inquiry may lead to a full ASTM-defined-Phase I ESA or to specialized study of the areas of concern [see 4.3.4 of ASTM E1528-93].
3.	The ESA should be conducted by an independent environmental site assessor but where it is done by an employee of the user, there should be functional separation and the relationship should be clearly defined in the final report. {see 3.2}	The environmental site assessor under the ASTM definition must be an environmental professional but may be independent or an employee of the user. [see 3.3.11]

<sup>1</sup> American Society for Testing and Materials 1993b

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	CSA Standard	ASTM Standard
4.	The environmental site assessor will use due care, diligence, and judgement in conducting the Phase I ESA. {see 3.5}	The suitable levels of appropriate inquiry and due diligence are dependent on the kind of property being considered and the Standard explains the legal details of these issues under CERCLA. [see 3.3.4 and 3.3.9]
5.	The Standard is the <u>minimum</u> requirement for the performance of a Phase I ESA. Enhancements may be added by expanding the Scope of Work. The costs of gathering information in a Phase I ESA need to be balanced against the need to reduce uncertainties about the property. {see 3.7}	The level of the environmental site assessment will be guided by the type of property under investigation, the risk tolerance of the user etc. [see 4.5.3] and may be more or less comprehensive than the practice of the Standard [see 4.1]. The Standard allows discontinuation of the environmental site assessment if the cost of the information obtained outweighs its usefulness to the user [see 4.5.2].
6.	Phase I ESAs can be used in a number of ways including: in making financial decisions {see 4.1.1}, as baseline studies for later comparison {see 4.1.2}, in fulfilling regulatory requirements {see 4.1.3}, or as the basis for site remediation or redevelopment {see 4.1.4}.	ASTM-Phase I ESAs are intended primarily to assess the environmental condition of commercial real estate but can be used as an approach to conducting an inquiry to identify recognized environmental conditions on any property. [see 4.1]
7.	The client must permit access to documents it has in its possession upon the request of the environmental site assessor {see 5.5}.	The user must inform the environmental site assessor of any environmental liens on the property. [see 6.3.2]

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	CSA Standard	ASTM Standard
8.	The record review shall include documents back to the first development of the property or to the extent that historical information allows {see 7.1.3}.	The environmental site assessor must review thoroughly the standard historical sources [see 7.3.4] back to 1940 and before that if possible [see 7.3.2]
9.	<p>It is mandatory that the environmental site assessor examine aerial photographs {see 7.2.1}, property-use records {see 7.2.2}, title and assessment rolls {see 7.2.3}, previous Phase I ESA reports {see 7.2.4}, company records {see 7.2.5}, geological and geotechnical reports {see 7.2.6} and regulatory information {see 7.2.7} about the property.</p> <p>The list of records that may be reviewed depending on the site includes: geological and soil maps {see 7.3.1}, topographical maps {see 7.3.2}, agreements of purchase and sale {see 7.3.3}, land use documents {see 7.3.4}, public health concerns {see 7.3.5}, utility company records {see 7.3.6}, local information sources {see 7.3.7}, and other sources such as inventories of waste disposal sites {see 7.3.4}.</p>	<p>The inspector must review documents from several specific federal and state environmental sources such as the Federal facilities list, and the State lists of hazardous waste sites, all to the search distances specified. [see 7.2.1.1] Additional local sources of environmental records such as the Planning Department or the Utility Companies, may be accessed if deemed necessary. [see 7.2.2]</p> <p>It is mandatory that the environmental site assessor review the Current Minute Topographical Map for the site, and the consultation of further physical setting sources such as geologic, hydrogeologic, and soil maps, is at the discretion of the environmental site assessor [see 7.2.3]. Standard historical sources that must be consulted include: aerial photographs [see 7.3.4.1], recorded land title records [see 7.3.4.4], building department records [see 7.3.4.7], and land use records [see 7.3.4.8]</p>

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	CSA Standard	ASTM Standard
10.	This Standard mentions regard for the health and safety of the environmental site assessor during the site visit {see 8.1.1}.	There is no mention of the safety issues faced on a site visit.
11.	The site visit is basically the same in both Standards except this Standard includes the observation and documentation of: special attention items such as lead, asbestos-containing materials, etc. {see 8.1.12}, areas of unnatural fill or grading {see 8.3.10}, and surface water features {see 8.3.12}, whereas the ASTM Standard does not.	The site visit is basically the same in both standards except that a few items mentioned under the CSA Standard are not required under the ASTM Standard.
12.	Site personnel including the site manager and occupants as well as third party representatives should be interviewed {see 9.5.1, 9.5.2}. A reasonable attempt should be made to interview at least one government official from agencies with environmental or health related jurisdiction in the area {see 9.5.3}.	The interview stage is broken into two parts: interviews with owners and occupants, and interviews with local government officials [see 9 and 10]. In each case, a list of who should and could be interviewed is given. For the former this includes: the site manager, occupants, users, and non-users [see 9.5]. For the later, this includes: officials from local fire, health, and hazardous waste disposal agencies [see 10.5].

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	CSA Standard	ASTM Standard
13.	The content of the questions to be asked during the interview is limited to the applicable items detailed in the records review and site visit {see 9.2}.	Owners and occupants can be asked questions pertaining to the use or past use of the property as described during the site visit [see 9.2] however the government officials may be asked any question in regards to the site that the environmental site assessor feels is appropriate [see 10.2].
14.	The evaluation and reporting practices of the two Standards are basically the same except that this Standard offers four possible conclusions that the environmental site assessor can reach: no evidence of contamination, evidence of actual, evidence of potential, or evidence of actual and potential contamination {see 10.2.8}.	The evaluation and report preparation sections are basically the same in the two standards except that this Standard gives a choice between only two possible conclusions: no evidence of environmental conditions, or evidence for specified environmental conditions [see 11.6.1, 11.6.2]

### III.A.2. Summary of Findings

Even though the ASTM Standard is driven much more by limitation liability, the process and structure recommended for the performance of a "Phase I ESA" is very similar between the CSA and ASTM Standards. However, there are some important variations, most of which are the result of differences in legislation, documentation, and administrative practices between the two countries. The primary purpose, legislative climate, and specific knowledge required are all different.

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**III.B. STANDARDS OF OTHER REGULATORY AUTHORITIES AND ORGANIZATIONS**

The guidelines or standards published by the following organizations have been consulted to determine the level of training that they would expect in a professional who is accredited to perform a Phase I environmental site assessment.

- Canadian Council of Ministers of the Environment – National Contaminated Site Remediation Program (NCSRP)
- Canadian Mortgage and Housing Corporation (CMHC)
- Canadian Standards Association (with the endorsement of the CEAA) (CSA/CEAA)
- Consulting Engineers of Ontario (CEO)
- National Groundwater Association of the United States – Association of Groundwater Scientists and Engineers (NGWA)

A summary of areas of difference from the CSA Standard has been prepared for each of the above organizations. Table 3 outlines the main points of these summaries.

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### **III.B.1. Canadian Council of Ministers of the Environment**

#### **– National Contaminated Site Remediation Program (NCSRP)<sup>1</sup>**

The practices contained in the NCSRP guidelines details the entire process of sampling, analysis, and data management for a contaminated site. The scope of this kind of investigation is more than a Phase I environmental site assessor is trained to complete. In fact, it usually requires a team of specialists.

These guidelines outline separate investigation procedures for contaminated soil, sediments, and waters. Each of these procedures includes an initial step of information gathering, which is very similar to a Phase I ESA, before any planning or sampling is done. However, the goal of this first step is to gain information to aid in the development of an appropriate sampling plan; not to contribute to a decision-making process, or as a baseline environmental study, or to provide a legal defense against liability. Despite this difference, the information-gathering steps are basically the same as those outlined by the CSA Standard.

The review of existing site information and historical data is more cursory than that recommended by the CSA and is intended to provide only an overview of past and present uses of the site and of known and potential contamination. The CSA Standard does not involve the review of the plans of past sampling efforts and so this is one task suggested by these guidelines that a graduate of the proposed curriculum would not be trained to complete. Otherwise, the trainee would actually be overqualified for the performance of a document review according to these guidelines.

The site reconnaissance that is recommended by the NCSRP guidelines involves the mapping out of the processes and/or waste disposal areas on the site in order to facilitate the planning of sampling. The written description required by the CSA would not be sufficient for this purpose and so this is one area in which a trainee would be deficient. NCSRP-assessors are also asked to identify and map out the migration pathways for contamination on the site including: surface drainage, wind dispersion, human activity, etc., and this too would be a skill that the trainee would not possess. Other than this, a trainee would be fully capable of carrying out a site visit which, according to these guidelines, includes interviewing appropriate people.

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<sup>1</sup> Canadian Council of Ministers of the Environment 1993



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The fundamental differences in purpose and scope between these guidelines and the CSA Standard means that comparing the requirements for reporting is not worthwhile. The information gathered under these guidelines will be fed into the investigation-planning process and will be only a minor component of the final report.

In conclusion, a graduate of the proposed curriculum will be very qualified to carry out the information-gathering steps of an NCSRP investigation except for a small number of specific skills.

### **III.B.2. Canadian Mortgage and Housing Corporation (CMHC)<sup>1</sup>**

An environmental site assessment is required prior to the granting of mortgage insurance by the CMHC for a number of categories of property.

The CMHC's requirements for the first phase of this environmental site assessment are less rigorous than those recommended by the CSA Standard. The historical review must extend back to when the property was in an undeveloped state, however, only a small portion of the documents mentioned by the CSA Standard must be searched. The site visit, according to the CMHC, must include the documentation of the presence and condition of only the most basic and obvious characteristics of the property and signs of contamination. For example, it does not require the recording of the actual kinds and amounts of hazardous materials, but only asks that their mere presence be noted.

The CMHC requests that reports be presented in a non-technical readers. However, it also requests that if the first phase has resulted in a recommendation for further environmental site assessment, then its report should include details of this recommended additional work. This means the development and inclusion in the report of a work plan, schedule, and cost estimates. This is the only CMHC-environmental site assessment requirement that is not included in the CSA Standard. The CSA considers the role of the environmental site assessor to be one of determining only whether there is actual or potential contamination. It leaves the evaluation of options for further environmental site assessment up to the client or user of the given environmental site assessment.

With the exception of this last point of discrepancy, a trainee under the proposed curriculum would be extremely well prepared to carry out an environmental site assessment for the CMHC.

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<sup>1</sup> Canadian Mortgage and Housing Corporation 1992

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#### **IV.B.3. Canadian Standards Association Standard on Environmental Auditing (with the endorsement of the CEAA) (CSA/CEAA)<sup>1</sup>**

Audits may be conducted on management practices, environmental policies, as well as on environmental procedures and practices, and so not every audit will include environmental site assessment aspects. Only those that actually deal with contamination on the site will involve environmental site assessment practices.

An environmental audit, as defined by the CSA, is, "a systematic process of objectively obtaining and evaluating evidence regarding a verifiable assertion about an environmental matter, to ascertain the degree of correspondence between the assertion and established criteria, and then communicating the results to the Client. A verifiable assertion is a declaration or statement about specific subject matter that is supported by documented factual data."<sup>1</sup> An environmental audits is thus very different from an environmental site assessments. An audit judges a present situation or assertion against a set of agreed-upon criteria. The objectives of the audit are pre-set and a detailed audit plan must be prepared and approved by the client. The auditor then collects evidence and evaluates it with respect to the criteria and develops the audit findings which detail the degree of conformity to the criteria.

An auditor working according to the CSA/CEAA guideline must include all aspects of a CSA-Phase I ESA in the "collection of evidence" stage of the audit. It also requires other kinds of evidence gathering such as data and report analysis, analysis of internal processes, tracing data, and physical measurement. None of these are part of the CSA Standard for Phase I ESAs. These functions are necessitated by the comparative nature of an audit and are not, according to the CSA, part of a Phase I ESA which is strictly limited to the evaluation and reporting of existing information.

A graduate of the proposed AESAC training program would be well qualified to carry out specific parts of the evidence gathering activities of an environmental audit. He/she would be able to conduct the required interviews, review documents, and carry out any needed physical observations and inquiries. The evaluation and report writing skills of the graduates would also enable them to contribute the gathered information to the auditing process and findings. Thus the graduate would be well suited to working as part of an auditing team whose collective expertise would allow the group to implement all stages of an environmental audit according to the CSA/CEAA guideline.

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<sup>1</sup> Canadian Standard Association 1994a

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**IV.B.4. Consulting Engineers of Ontario<sup>1</sup>**

Environmental investigations carried out by engineers in conformance with the CEO standard involve elements of environmental liability assessments, environmental audits, and risk assessments. The liability assessment part of this detailed enquiry is divided into the same three phases found in other similar environmental site assessment standards, including the CSA Standard. The Phase I section is generally similar to the CSA Standard however more emphasis is placed on having specialists with technical expertise to carry out parts of the environmental liability assessment. The planning and supervision of the investigation is also emphasised, unlike the CSA Standard, which does not mention it explicitly.

The CEO standard recommends that the site visit be conducted before any document review is done. However, it is expected that the environmental site assessor, upon learning what activities are or have been occurring on the site, will have prior in-depth knowledge of the processes involved and the substances likely to be present. This means that the environmental site assessor is expected to be a specialist in the area of interest. He/she is expected, under this standard, to conduct a much more extensive and technical site visit than is specified in the CSA Standard. Additional requirements include: accounting for all materials and wastes by comparing inventories and shipping records with conditions on the site, inspecting loading/shipping areas, monitoring systems, outdoor transformers, and equipment, as well as the documentation of testing procedures.

The task of conducting interviews as part of the environmental site assessment is more extensive under this standard than the CSA Standard. Many more interviews are recommended and the scope of the questions that may be asked is much wider. The environmental site assessor is instructed to make inquiries into such things as the state of the corporate environmental and safety policies.

Under the CEO standard, the records review activity comes last before writing the report and is superficial compared to that required by the CSA. It is intended mainly to back up the findings of the site visit and interviews.

In summary, the environmental site assessment standard detailed by the CEO is principally oriented towards the gathering of technical details on the property and focuses less on the document review stage than does the CSA Standard. It depends very much on the technical knowledge of engineers that enables them to have a sense of the potential problems on a site before they do any investigation

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<sup>1</sup> Consulting Engineers of Ontario 1993

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at all. They also understand the details of the equipment and systems that are required to be inspected under this standard but not under the CSA Standard. This means that an engineer who is also trained under the proposed curriculum would have most of the skills and knowledge necessary to complete an environmental site assessment under the CEO standard.

### **III.B.5. National Groundwater Association (United States)**

#### **- Association of Groundwater Scientists and Engineers<sup>1</sup>**

As an American institution, the guidelines of this organization are aimed mainly at satisfying the "all appropriate inquiry" clause of the CERCLA legislation and thus ensuring the "innocent land owner" defense against liability. This guideline is thus simply a description of the tasks that could be included in an environmental site assessment. It makes no recommendations about which tasks are suitable for a given site and leaves such decisions up to the user and/or environmental site assessor.

The NGWA guidelines deal strictly with the activities involved in a preliminary environmental site assessment and divides them into information review (including interviews), site walk-over, and reporting activities.

The information review is very similar to that required by the CSA Standard however there are a few discrepancies. Firstly, in the United States, there are legislative (eg. CERCLA), permit (eg. pretreatment permits under the Clean Water Act), and planning (eg. Spill Prevention Control and Countermeasures Plan) requirements that an industrial operation must fulfil. This also means a great deal of information can be gathered from the documentation created for fulfilment of these requirements. The searching and evaluation of these documents is not covered by the proposed AESAC curriculum. The NGWA guideline also makes specific reference to the documenting of crop and facility history on former and present agricultural land with special attention paid to any activities that are potential sources of contamination. Under the CSA Standard, agricultural land is basically considered "undeveloped" and thus does not require a records review. Other than these two aspects, a trainee under the proposed AESAC curriculum would be fully competent and able to perform a records review according to this guideline.

In addition to the activities of a site visit as detailed by the CSA Standard, the NGWA guideline requires two additional types of observations and descriptions. The environmental site assessor is

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<sup>1</sup> National Groundwater Association 1992

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asked to note specific receptor data such as whether there are any close-by residential areas, school yards or parks, and to observe monitoring equipment present on the site. Environmental site assessors are also required to document all parts of the site visit by photographing everything.

The reporting format suggested by the NGWA guideline is the same as that required by the CSA Standard. Therefore, with only a few exceptions, a graduate of the proposed training program would be qualified to carry out an environmental site assessment according to the NGWA guideline.

**TABLE 3. OVERVIEW OF TRAINING EXPECTATIONS UNDER  
GUIDELINES/STANDARD OF CONSULTED ORGANIZATIONS**

	Would an AESAC environmental site assessor be competent?	Additional Requirements
CSA	Yes	None
NCSRP	Yes	The environmental site assessor would need a small number of additional skills such as descriptive mapping and reviewing of past sampling efforts.
CMHC	Yes	The environmental site assessor must include a Phase II proposal in the Phase I report.
CSA/ CEAA	Yes	The environmental site assessor works as part of a team to complete the audit requirements.
CEO	Yes	The environmental site assessor must be a professional engineer.
NGWA (US)	Yes	The environmental site assessor needs training in US legislation and sources of information.

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### **III.C. SUMMARY AND RECOMMENDATIONS FOR SUPPLEMENTAL TRAINING**

Sections III.A. and III.B., above, have highlighted a number of skills and issues that are not part of the CSA Standard but which would need to be considered if an environmental site assessment is conducted according to other guidelines and standards. A professional certified by AESAC, would be lacking only a small number of specific skills required to complete environmental site assessments under these alternative guidelines.

The summary of findings from the CSA-ASTM comparison, and the comments included in Table 3, highlight a number of areas that could be the basis for supplemental training programs which could be offered by AESAC. This would enable AESAC-certified environmental site assessors to become fully qualified to perform the activities of an environmental site assessment according to the standards or guidelines of these other organizations. The following general course headings are suggested:

- i. the role of Phase I-like environmental site assessments in larger initiatives: implementation as part of site remediation activities, environmental audits, and technical site investigations (this course could be offered with the CEAA)
- ii. NCSRP-required skills: information gathering as steps of a site remediation investigation
- iii. summary of Phase II environmental site assessments: recommending and detailing Phase II work in Phase I environmental site assessment reports
- iv. the certified environmental site assessor as part of auditing or investigative teams
- v. performing Phase I environmental site assessments in the United States: the legal issues, and sources of information

**GLOBALTOX** recommends that AESAC offer accredited members the opportunity to take supplementary courses. These courses should address the areas of variation between the CSA Standard and each of the other specific guidelines and standards (eg. one course for NCSRP, one for ASTM, etc.). They should assist in making AESAC-certified professionals competent in the performance of environmental site assessments according to these other guidelines and standards.

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This kind of continuing education will ensure the continued improvement of the professionals accredited by AESAC and the continued demand for their services. It will also make certified professionals adaptable to the rapidly evolving requirements of environmental site assessment in both Canada and the U.S.

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## **V. ADDITIONAL RECOMMENDED READING**

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