



# Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta

## Joint Practice Standard

V1.0  
September 2007

### *Professional Regulatory Organizations*

*Alberta Institute of Agrologists (AIA)*  
*Alberta Society of Professional Biologists (ASPB)*  
*Association of the Chemical Profession of Alberta (ACPA)*  
*Association of Professional Engineers, Geologists and  
Geophysicists of Alberta (APEGGA)*  
*College of Alberta Professional Foresters (CAPF)*  
*College of Alberta Professional Forest Technologists (CAPFT)*

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### FOREWORD

This is a new practice standard - intended to define the professional and ethical responsibilities of *professional members* in the completion and assurance of *reclamation* and *remediation work* in Alberta. The allocation of responsibilities for contaminated sites and for multi-discipline projects in this document has been adapted from:

- *Guidelines for Contaminated Sites Approved Professional Services on Eligible Sites*, Version November 14, 2005, Society of Contaminated Sites Approved Professionals of British Columbia;
- *Guidelines for Professional Services in the Forest Sector – Crossings*, March 2005, by the Association of Professional Engineers and Geoscientists of British Columbia and the Association of BC Forest Professionals; and
- *Alberta Building Code and Responsibilities for Engineering Services for Building Projects V1.0*, April 2001, APEGGA.

A practice standard presents a level of performance expected of *professional members*. Although a standard is not specifically legislated under the respective *professional regulatory organizations'* acts and regulations, *members* are expected to conform to it in order to be practising in accordance with what is deemed to be an acceptable standard. Each *professional regulatory organization* is responsible for investigating any complaints of unskilled or unethical practices by their *members*. Substantive complaints are referred to the respective discipline committee. Upon hearing and weighing the evidence, the discipline committee may order the following: reprimand, suspend or cancel registration, limit practice, impose conditions (practicing under supervision, permit periodic inspections and practice reviews), require demonstration that a disability or addiction has been overcome, require counseling, and impose financial penalties, and repayment of clients' fees.

Practice standards use the word *shall* to indicate requirements to be followed in order to conform to the standard (*Shall* means *is required to*). The word *should* indicates that among several possibilities, one is recommended as particularly suitable without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain course of action is disapproved of but not prohibited (*should* means *is recommended that*). The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* means *is permitted*).

### PARTICIPANTS

A joint task force comprising representatives of the six *professional regulatory organizations* has prepared this practice standard in order to achieve uniformly high standards of professional practice which meet the intent of the respective acts and regulations and which identifies what the public should expect from any *professional member*. The goal of the joint task force is also to provide a level of assurance in which a competent and effective consulting industry can thrive and produce direct benefits to the public. During the time this practice standard was developed, the joint task force had the following membership:

David Williams, Ph.D., P.Eng. – Chair, APEGGA representative  
 John Banks, P.Chem. – ACPA representative  
 David Halwas, P.Geol. - APEGGA representative

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Ed Osborne, P.Ag. – AIA representative  
Robert Staniland, P.Biol. – ASPB representative  
Peter May, P.Biol. – ASPB representative  
Chris Walsh, RPFT – CAPFT representative  
Stuart Carter, RPFT – CAPFT representative  
Michael Wood, RPF – CAPF representative

The final development of the guideline was greatly assisted through significant contributions of time and expert knowledge by:

Kathryn Bessie, P.Ag.  
Doug Bisset, P.Eng.  
David S. Chanasyk, Ph.D., P.Ag, P.Eng.  
Dennis Langen, P.Eng., LLB.  
Christine Nicholls, P.Ag.  
Barbara McClary, P.Geoph.  
Gerhard Magner, P.Eng.  
Craig Rose, RPF, LLB

Comments that may help to improve this document should be forwarded to:

Lianne Lefsrud, P.Eng.  
Professional Practice, APEGGA  
1500 Scotia One, 10060 Jasper Avenue  
Edmonton, Alberta T5J 4A2  
E-mail: <llefstrud@apegga.org>  
Fax: (780) 426-1877

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## 1 OVERVIEW

Alberta Environment, Alberta Sustainable Resource Development, and the Alberta Energy and Utilities Board are the primary authorities having jurisdiction over *reclamation* and *remediation work* in Alberta. These *regulators* are reviewing the regulatory framework for *remediation* and *reclamation* activities to include the concept of *professional sign-off*.

Recognizing the interdisciplinary nature of *remediation* and *reclamation work*, this practice standard has been jointly developed by the Alberta Institute of Agrologists; Alberta Society of Professional Biologists; Association of the Chemical Profession of Alberta; Association of Professional Engineers, Geologists and Geophysicists of Alberta; College of Alberta Professional Foresters; and College of Alberta Professional Forest Technologists. In defining the professional roles and responsibilities in *reclamation* and *remediation*, this document serves as a foundation for *professional sign-off*.

### 1.1 SCOPE

This document outlines the professional and ethical issues involved in providing professional services in *reclamation*, *remediation*, and related *project* management. It addresses the relative responsibilities of *professional members* of the respective *professional regulatory organizations* involved and the professional services that are normally provided. These services generally involve the completion and/or review of reports, plans, and assessments pertaining to the investigation, *reclamation*, *remediation*, and management of *contaminated* sites and preparation and submission of recommendations to the *regulators* for issuance of a *reclamation* or *remediation* certificate.

It is recognized that the application of professional judgment is an integral part of doing *reclamation* and *remediation work* and, as such; the application of this practice standard may vary depending on the circumstances. This practice standard does not replace existing legislation, regulations, policies or guidelines, or preclude the need for appropriate education, training and experience.

### 1.2 PURPOSE

There are two main purposes of this practice standard. First, it provides a joint standard of practice for *remediation*, *reclamation* and related *project* management that defines acceptable practice for *professional members* providing these services. This offers the *professional regulatory organizations* a mechanism to evaluate the level of professional practice and quality of *work* of their members. Should there be a complaint regarding unskilled or unethical practice or a *professional member*, this document serves as the standard by which the member's conduct may be judged. Second, it gives the public and industry a higher level of confidence in the standard of *reclamation* and *remediation work* being done in Alberta.

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### 1.3 DEFINITIONS

For the purposes of this document, the following terms and definitions apply and are italicized throughout.

**Authentication**

Application of the *professional member's stamp*, seal or membership/registration number; signature; and date.

**Arms-length review**

*Work* involving the review of reports, plans, and assessments that were not prepared by the *coordinating professional* or *contributing professional* or prepared under his or her *direct supervision*.

**Client**

The party who engages the *coordinating professional* and, in some cases, the *contributing professional(s)* to provide the required professional services in *reclamation* or *remediation work*.

**Competent practitioner**

An individual, who has acquired a combination of education and *work* experience relating to specific activities that results in the individual having the ability to undertake, at an appropriate level, one or more component(s) of the *reclamation* or *remediation work*. The term "appropriate" is defined as *work* that practitioner peers of similar, or greater, education or *work* experience level would deem to be suitable for the scope of *work*. This category may include practitioners who hold Canadian Certified Environmental Practitioner (CCEP), Certified Engineering Technologist (CET), or other such designations.

**Contractor**

A *person* who contracts with an *owner*, *client*, or his or her authorized agent to undertake a *project*, and may include the *owner* or *client* who undertakes the *work* for him or herself on a *project*, or any part thereof.

**Contamination**

Contamination is generally considered to be presence of any substance released as a result of human activity that might adversely affect human health, ecological health or environmental quality. Contamination may be present at a site due to a number of factors, including the site's historical operations, the occurrence of spills, leaks or discharges, deposition of by-products or residues, the cumulative effects of airborne deposition, subsurface migration or direct application or burial, or the use of imported fill.

**Contributing professional**

A *professional member* or another professional (veterinarian, toxicologist, etc.) who has either:

- a) specialist technical expertise and responsibility for a portion of the *reclamation* or *remediation work* or
- b) managerial responsibility for a portion of the *reclamation* or *remediation work*

who is able to accept professional responsibility for that portion of the *work*, and whose *work* can be relied upon by the *coordinating professional*.

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**Coordinating professional**

A *professional member* retained to coordinate and/or review the *work of contributing professionals* and other *competent practitioners* on a *reclamation* and/or *remediation project* and provide *professional sign-off* on the *project* as a whole.

**Data Quality Objectives (DQOs)**

*DQOs* are defined criteria for the quality of data generated or used in a particular study to ensure that the data are of acceptable quality to meet the needs of the *project*.

**Direct supervision**

The responsibility of a *professional member* for the direction, management, and conduct of professional services carried out by others.

**Landowner**

The *person* who possesses or owns land, including the Crown.

**Owner**

The registered owner of the land, a purchaser of the land whose interest as a purchaser is shown on the certificate of title to that land, or a tenant or other person who is in lawful possession or occupation of the land.

**Person**

An individual, corporation, company, association, firm, partnership, society, or other entity/organization.

**Professional member**

An individual licensed or registered as:

- a) a professional engineer, professional geologist, professional geophysicist, registered professional technologist (engineering), registered professional technologist (geological), registered professional technologist (geophysical), or licensee entitled to engage in the practice of engineering, geology, and geophysics under the Engineering, Geological and Geophysical Professions Act, R.S.A. 2003, c. E-11.1.;
- b) a professional agrologist or registered technologist (agrology) under the Agrology Professions Act R.S.A. 2005, c. A-13.5;
- c) a professional biologist under the Professional Biologists Regulation (AR 120/2002 Professional and Occupational Associations Registration Act);
- d) a professional chemist under the Professional Chemists Regulation (AR 248/2001 Professional and Occupational Associations Registration Act);
- e) a registered professional forester under the Regulated Forestry Profession Act, R.S.A. 2000 c. R.-13; or
- f) a registered professional forest technologist under the Regulated Forestry Profession Act, R.S.A. 2000 c. R.-13;

who is also

- g) a member in good standing of a professional *regulatory organization*;
- h) a practicing member in compliance with the *professional regulatory organization's* continuing professional development program; and



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- i) competent to sign off *reclamation* or *remediation work* by virtue of having the educational, experience, and other requirements as defined by the *professional regulatory organization* and by the *regulators*.

### **Professional regulatory organization(s)**

The associations or colleges that have been given the statutory authority to regulate their respective professions to ensure that the public is protected and whose scopes of practice include *reclamation* and *remediation*: Alberta Institute of Agrologists (AIA), Alberta Society of Professional Biologists (ASPB), Association of the Chemical Profession of Alberta (ACPA), Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA), College of Alberta Professional Foresters (CAPF), and College of Alberta Professional Forest Technologists (CAPFT).

### **Professional sign-off**

The application of the *professional member's stamp* or seal or membership/registration number, signature, and date to a plan, report, map, or any other form of document indicating that: the *professional member* has supervised and/or reviewed the *reclamation* or *remediation* of the *property*, that the *property* has been *reclaimed* or *remediated* to an acceptable standard as per the *regulators'* requirements and that the *regulators* may rely upon the *professional member* for reporting and issue a *reclamation* or *remediation* certificate for the *property*.

### **Project**

The total *work* contemplated.

### **Property**

*Property* comprises land and the improvement of any physical object with some degree of permanence. The terms *property* and *site* are used interchangeably in this document.

### **Quality assurance (QA)**

Evaluating overall *project* performance on a regular basis to provide confidence that the *project* will satisfy the relevant quality standards.

### **Quality control (QC)**

Monitoring specific *project* results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory results.

### **Reclamation<sup>1</sup>**

Any or all of the following:

the removal of equipment or buildings or other structures or appurtenances;

- a) the de-*contamination* of buildings or other structures or other appurtenances, or land or water;
- b) the stabilization, contouring, maintenance, conditioning, reconstruction, or revegetation of the surface of land; and
- c) any other procedure, operation or requirement specified in the regulations.

<sup>1</sup> Definition as per the *Environmental Protection and Enhancement Act* (EPEA).

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### **(Surface land) reclamation<sup>2</sup>**

The stabilization, contouring, maintenance, conditioning, reconstruction, or revegetation of the land surface to a state that permanently renders the land with a capability equivalent to its pre-disturbed state or for an alternate designated land use.

### **Regulators**

The authorities having jurisdiction over *reclamation* and *remediation work* in Alberta: Alberta Environment, Alberta Sustainable Resource Development, and the Alberta Energy and Utilities Board.

### **Remediate or Remediation<sup>3</sup>**

The process or act of reducing, removing or destroying substances in soil or water through the application of physical, chemical or biological processes.

### **Stamp**

The *stamp* or seal issued to a *professional member* by a *professional regulatory organization*.

### **Work**

The tasks required to complete the *reclamation* and/or *remediation* of the *property*, as outlined in Appendix B.

## **2 SELF EVALUATION**

*Professional members* shall recognize that environmental issues are interdisciplinary in nature, undertake only *work* that they are competent to perform by virtue of training and experience, recognize individual limitations, and have regard for the professional opinions of environmental specialists in other disciplines.

*Professional members* shall ensure that they possess a combination of formal education, skill, experience and training as required by the *professional regulatory organizations* and by the *regulators* to provide technically sound *reclamation* and *remediation work*. Professionals practicing in *reclamation* and *remediation* must ensure that their skills are consistent with the requirements of the industry and that these skills are constantly improved and enhanced through training and knowledge sharing.

Professional practice demands integrity, competence and objectivity while fulfilling responsibilities to the public, the employer or *client*, the profession, and other *professional members*. *Professional members* providing *reclamation* and *remediation* services are advised to refer to their own professions' code of ethics periodically to ensure that the application of their skills is consistent with their professional standards. The rules of professional conduct serve not only as a guide to *professional members*, but also as a source of assurance to the public of the *professional members*' concern for the public they serve.

2 Definition as per EUB Informational Letter IL 98-2, Memorandum of Understanding Between AEP and EUB on Suspension, Abandonment, Decontamination, and Surface Land Reclamation of Upstream Oil and Gas Facilities, 26 March 1998.

3 Definition as per Alberta Environment's Remediation Certificate regulations.

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### 2.1 SELF EVALUATION OF REQUIRED COMPETENCIES

Alberta Environment organized and chaired the Competencies for Remediation and Reclamation Advisory Committee (CRRAC) in 2005-2006 to identify the general competencies required to conduct *remediation* and *reclamation work*. In February 2006, CRRAC issued a recommendation report (refer to Appendix B) which defines the general competencies, context, core knowledge and abilities, *quality assurance (QA)* and *quality control (QC)* required for this *work*, and describes the general tasks for *remediation* and *reclamation*.

The Competencies Tables (see Appendix B) recognizes that *remediation* and *reclamation* services are often multi-disciplinary in nature. Further, it recognizes that any one individual may not have the entire skill set (qualifications and/or experience) necessary to address and complete all the possible tasks or assignments involved in a particular assignment. These tables help to guide *professional members* in the assessment of their own skills and toward the selection of team members who will fulfill the needs of the *project* and *client*.

The Competencies Tables also recognize *quality assurance* as a very important aspect of professional practice in *reclamation* and *remediation*. *Professional members* are advised to refer to the most recent version of the Competency Tables to seek guidance in the self-evaluation process.

Professions have a number of specialties and/or practices recognized within them. The professions themselves are charged with the legal responsibility of ensuring their *professional members* are qualified to practice in the field or area of interest within which they are offering services to the public. Refer to the *professional regulatory organizations'* defined scopes of practice, as required.

### 2.2 SKILL DEMONSTRATION

A *professional member*, as required under the code of ethics, must only undertake *work* in his or her profession for which he or she is competent and qualified. Therefore, the *coordinating professional* is entitled to assume that if a *professional member* undertakes an assignment for a portion of the *work* within the discipline, then that *professional member* is competent and qualified. However, if evidence arises that suggests that *professional member* is not competent or qualified, then the *coordinating professional* must undertake such additional review to ascertain whether the individual is competent and qualified. As part of his or her due diligence process, the *coordinating professional* may choose to verify experience prior to work beginning.

### 2.3 DISCIPLINE

This practice standard, the *professional regulatory organizations'* codes of ethics, and other guidelines define the standard of care expected of *professional members*. *Professional regulatory organizations* will use these to evaluate the level of professional practice and quality of *work* of their *professional members*. Should *professional members* exhibit unprofessional conduct in any manner, they are subject to disciplinary action by their respective *professional regulatory organizations* as set out under their enabling legislation and regulations. It should be noted that a complaint respecting a *professional member* may be dealt with within two years following the date of

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cancellation of the *professional member's* registration, as if the cancellation had not occurred.

### 3 PROFESSIONAL SIGN-OFF

*Professional members* who sign off for *reclamation/remediation work*, may be a *contributing professional* signing off on a portion of the *work* or a *coordinating professional* signing off on the *work* as a whole. The same professional standard of care applies to *contributing professionals* and *coordinating professionals*.

#### 3.1 AUTHENTICATION

As part of *professional sign-off*, the *professional member* shall *authenticate* the professional documents supporting each *reclamation* or *remediation* certificate application. It is important for every *professional member* to recognize that the application of his or her signature and seal conveys a message of reliability to *clients* and the public in general. *Authentication* should not be jeopardized for commercial reasons; failure to recognize this compromises public health and safety, the reputation of the *professional member*, and the *work* itself.

In *authenticating* professional documents, *professional members* are advising that:

- they prepared the documentation themselves, that the documentation was prepared under their *direct supervision*, or that they have completed a thorough *arms-length review* and are able to accept professional responsibility for the *work* therein;
- they have the relevant training, experience and working knowledge of legislation, regulation and guidelines relevant to the topic;
- they have knowledge of relevant information sources;
- they are competent to do the *work* or to *directly supervise* the *work* contained therein, or competent to do an *arms-length review* of *work* prepared by another *professional member*;
- they are functioning under the standards and terms of their profession; and
- *regulators*, other *professional members*, and the public may rely upon the *work*.

#### 3.2 PRINCIPLES OF AUTHENTICATION

The principals of *authentication* are the following:

- *Authentication* shall consist of applying the *professional member's stamp* or seal or membership/registration number, his or her signature, and the date of *authentication*.
- The *professional member* shall authenticate only those professional documents he or she has prepared, to those parts of a document he or she has prepared, or to professional documents that were prepared under his or her *direct supervision* and control. In the case of professional documents prepared by someone else, a *professional member* shall authenticate the documents only after a thorough *arms-length review* of the documents and accepting professional responsibility for them.
- A *professional member* shall maintain direct control of his or her *stamp* at all times. The *professional member* shall apply the *stamp* personally, or he or she may allow the *stamp* to be applied by a *person* acting under his or her direct control.

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- A *professional member* shall use the *stamp* only while registered with the *professional regulatory organization*, and while having the right to practice. The stamp shall be returned to the *professional regulatory organization* on demand.
- A *professional member* is responsible for practicing within his or her area of competence. The regulatory requirements for *authentication* of professional documents do not affect matters of civil liability. A *professional member* could be found liable with regard to professional documents that he or she prepared whether or not he or she *authenticated* them. Civil liability issues are for the courts to decide.
- If more than one profession has been involved in the *work*, each *contributing professional* shall *authenticate* and take professional responsibility for his or her own work. The *coordinating professional* is entitled to rely upon and refer to the *work* of the *contributing professionals*. That *work* could appear as separate appendices or sections to the *coordinating professional's* main report and recommendations, so as to clearly delineate the responsibility of each *contributing professional*. See the second bullet above.
- If the professional documents contain engineering, geological, or geophysical *work* as per the *Engineering, Geological, or Geophysical Professions Act*, then the permit number must also be applied to those documents.

For a more detailed discussion of the *authentication* process, APEGGA members are referred to the *Practice Standard for Authenticating Professional Documents V2.0*, April 2002, APEGGA.

### 3.3 DOCUMENTS RELIED UPON IN SUPPORT OF PROFESSIONAL SIGN-OFF

Documents and reports prepared or reviewed by *professional members* and considered by the *coordinating professional* in support of *professional sign-off* may include, but are not limited to, the following:

- Pre-construction site assessment
- Phase I environmental site assessment (Phase I ESA)
- Phase II environmental site assessment (Phase II ESA)
- Risk assessment
- Remediation plan
- Reclamation plan
- Risk management plan
- Confirmation of Remediation
- Post Reclamation site assessment
- Laboratory reports

If a *professional member* has prepared one of these documents, it shall be *authenticated* by that *professional member*. If the document has been prepared by someone other than a *professional member* (i.e., a *competent practitioner*) and it does not need to be authenticated, regardless, the *professional member* must determine if he or she may rely upon that document before completing *professional sign-off*. The professional member

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shall indicate in writing that he or she has relied upon that report for the purpose of the *reclamation/remediation* certificate application.

### 4 RESPONSIBILITIES OF INVOLVED PARTIES

#### 4.1 RESPONSIBILITIES OF CLIENT

In order for *professional members* to carry out the *reclamation/remediation work*, the *client* should undertake the following:

- Define the scope of *work* and deliverables for the *project*, ensuring that the scope of any relevant assessment *work* is adequate to identify all likely areas of potential environmental concern and contaminants of potential concern.
- Before *work* starts, complete a written agreement with the *coordinating professional* confirming the scope, compensation, and schedule for the services.
- Disclose fully and promptly to the engaged *coordinating professional* all information (written or otherwise) related to the *reclamation/remediation work* (e.g., operational history of the site).
- Disclose promptly to the engaged *coordinating professional* all previous involvement by other *professional members* performing *reclamation/remediation work* on the *project*, including site assessments related to the operational life of the site.
- Recognize that the need may arise during the *work* for clarification or additional *work* associated with the reports, plans and assessments submitted for review before the *professional member* is able to provide *professional sign-off* on a *reclamation or remediation* certificate application.
- Ensure that all acts, regulations, policy, procedures and guidance are followed during the *work*.
- Ensure that all appropriate documents are submitted to the *regulator* and that the information is accurate, consistent, and complete. If there are any outstanding issues, the *client* should discuss these with the *coordinating professional* before the application is made to the *regulator*.
- Bring concerns relating to the performance of substandard *work* by a *professional member* within the scope of *work* to the attention of that *professional member* for resolution. If no resolution is possible, bring the work to the attention of the *member's professional regulatory organization*.

#### 4.2 RESPONSIBILITIES OF REGULATORS

In order for the *professional member* to carry out the *reclamation/remediation work*, the *regulators* should undertake the following:

- Provide assurance to the public that the system of professional governance (as outlined in section 4.3) is operating to an acceptable standard.
- Ensure that the appropriate policies and regulatory regulations are in place to guide *professional members* in their *work*.
- Engage the appropriate *professional members* in the development and implementation of policies and regulations related to *reclamation* and *remediation*

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- Respond to questions submitted in writing by the *professional member* concerning interpretation of acts, regulations, policy, procedures and guidance that may arise during the *work*.
- Ensure that a *professional member* has signed-off the *work*.
- Ensure an appropriate review of certificate applications and reports.
- Ensure that the persons conducting audits are *professional members or competent practitioners*.
- Provide a letter outlining administrative or scientific reasons for an application refusal or certificate cancellation.
- Continue to *work* with the Joint Environmental Professional Practice Board to ensure regulatory efficiency.

#### **4.3 RESPONSIBILITIES OF PROFESSIONAL REGULATORY ORGANIZATIONS**

To regulate the practice of *professional members* carrying out the *reclamation/remediation work*, the *professional regulatory organizations* shall undertake the following to ensure the protection of the public:

- Describe practice standards.
- Define ethics of the profession.
- Investigate complaints and discipline *professional members* if standards or ethics have been breached.
- Maintain annual continuing professional development records for practicing *professional members*.
- Review the practices of *professional members*.
- Maintain a public record of *professional members*.
- Establish and support the Joint Environmental Professional Practice Board.

#### **4.4 GENERAL RESPONSIBILITIES OF PROFESSIONAL MEMBERS**

- The *professional member*, regardless of his or her role in the scope of *work*, has the primary duty for protection of the public.
- The *professional member* has a duty to conduct his or her *work* to an appropriate standard of care.
- The *professional member* should determine if he or she has a potential or perceived conflict of interest in conducting the *work*, before establishing an agreement for services. If the performance of *work* can reasonably be foreseen to result in a conflict of interest, the *professional member* should not conduct the *work*. If there is a potential or perceived conflict of interest at any time before or during performance of the *work*, the *member* must document and inform all involved parties of the conflict.
- In conducting the *work*, the *professional member* shall maintain a current knowledge of all acts, regulations, policies, procedures and guidance documents of the regulators and of other agencies (whether at the municipal, provincial or federal government level). The *professional member* shall ensure that all aspects of the relevant environmental legislation and regulation have been followed.

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- The *professional member* shall maintain a current knowledge of science, engineering and standard industry practice related to *reclamation* and *remediation*.
- If, during the course of his or her review, the *professional member* becomes aware of a poor or prohibited practice, the *professional member* must promptly bring this to the attention of the responsible party (including responsible *professional members*) and, if appropriate, the *regulators* and/or the *professional regulatory organization*.
- The *professional member* may be required to rely on reports, plans, assessments or other documents prepared by others. The *professional member* shall determine that all current mandatory requirements of the legislation and regulations have been met. The *professional member* should understand the historical guidelines, regulations, and *QA/QC* policies in order to determine and advise on the reliability of the previously prepared information. The *professional member* shall make reasonable efforts to confirm that the data have been collected in a manner consistent with professional practice and that no systematic or intentional bias exists in the data. However, it is not the responsibility of the *professional member* to conduct sampling and analysis of environmental media (e.g., soil, water, air, indicator plant species, etc.) to independently verify the findings of *work* by others.
- The *professional member* may seek clarification in writing on the reports, plans, assessments or other documents prepared by others - possibly completed by a number of parties over a period of time. If the *professional member* determines that there are deficiencies that will require additional sampling or other *work*, the *professional member* should notify the *client*, in writing, of the deficiencies.
- The *professional member* may delegate portions of the *work* to *competent practitioners* under the *professional member's direct supervision*. The *professional member* shall accept professional responsibility for that *work* and do additional *QA/QC* to determine the sufficiency of that *work*.
- The *professional member* is responsible for documenting the *work*.
- The *professional member* shall determine whether or not the *reclamation* or *remediation work* meets the mandatory requirements of legislation and regulations.
- If the *professional member* encounters aspects of the *work* that differ from the *regulators' policy* and guidance, but in his or her judgment the *work* conforms with the intent of the act and regulations, the *professional member* should seek written clarification from the *regulators* prior to submitting a *reclamation* or *remediation* certificate application.

### 4.5 RESPONSIBILITIES OF PROFESSIONAL MEMBER AS COORDINATING PROFESSIONAL

The *coordinating professional* is responsible for all aspects of the *reclamation/remediation project* including coordination, planning/design, field reviews, site plans, and *QA/QC*. The *work* of the *coordinating professional* in providing *professional sign-off* may include the review and assurance of *work* conducted by the *coordinating professional* under his or her *direct supervision* or an *arms-length review* of the *work* conducted by others, or a combination thereof.

The scope and complexity of the *reclamation* and *remediation work* will vary depending upon the site conditions, the objectives of the *client*, and the legislative requirements.



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Before starting the *reclamation* or *remediation* work or review thereof, the *coordinating professional* shall communicate with the *client*:

- to determine the specific objective of the *work*;
- to determine the terms of reference and scope of services for the *work*;
- to disclose professional liability insurance coverage and reach agreement on fees, payment schedule and schedule for completing the *work*;
- to confirm with the *client* that the *professional member* may disagree with conclusions made in the investigations, plans and assessments to be reviewed and that this may necessitate additional *work*; and
- to inform the *client* of his or her areas of expertise and the requirement to engage other necessary expertise.

Additional responsibilities include the following:

- The *coordinating professional* is responsible for confirming the overall quality of the analytical data set, that the *QA/QC* program meets with the *DQOs*, and that the analytical data support the conclusions regarding field conditions.
- The *coordinating professional* is responsible for reviewing investigations, plans, assessments, reports, and other documents which document the site condition; determine if these materials support the conclusions regarding the compliance of the site with applicable guidelines and standards; and ensure that these documents are submitted along with the application for a *reclamation* or *remediation* certificate. The final accountability to the public and *regulators* lies with the *coordinating professional* signing off on the certificate application.
- *Coordinating professionals* shall apply professional and responsible judgment in interpreting the *work* of *contributing professionals*.
- The *coordinating professional* is responsible for bringing deficiencies in previous or current *work* to the attention, in writing, of the client.
- A *coordinating professional* cannot take responsibility for *work* outside of his or her scope of practice. He or she must rely on the appropriate *contributing professional*.
- The *coordinating professional* must construct a suitable team structure and management plan to ensure that the *work* and the associated responsibilities are distributed appropriately.

In preparing and/or reviewing any relevant documents such as those referenced in Section 3.3, which may be used to support conclusions leading to *professional sign-off*, the *coordinating professional* should consider the following:

- Has/have the objective(s) been met?
- Has the scope of any relevant assessment *work* been adequate to identify all likely areas of potential environmental concern and contaminants of potential concern?
- Have all relevant data (records, observations, analytical data, etc.) been included with the reports?

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- In conducting an *arms-length review*, the *coordinating professional* shall document the findings of the review and the basis for the recommendation to the *regulators* that a *remediation* certificate or *reclamation* certificate be issued.
- Have the appropriate regulations, policies, standards and guidelines been followed and current science, engineering, and industry practice been used in the evaluation of site conditions?
- If *remediation* or *reclamation work* has been undertaken, has sufficient confirmatory information been obtained and/or provided to demonstrate compliance with applicable guidelines and standards, in all areas, and for all contaminants of potential concern?
- Are the conclusions of the report(s) clear and unambiguous and supported by the assessment results?
- Has the *work* been completed by qualified *professional members* or *competent practitioners*?
- Have appropriate QA/QC procedures been followed?
- Are the reports free of statements of limitation that preclude the *coordinating professional* or *regulators* from relying on the *work* to support the issuance of a *reclamation* or *remediation* certificate?

If the *coordinating professional* determines that the data are insufficient to develop adequate conclusions or recommendations with respect to the site, he or she should request clarification from the report authors or ensure that the required additional data are obtained. If the data are insufficient to demonstrate compliance with applicable guidelines and standards, the *coordinating professional* shall notify the client that additional *work* is required before recommending the issuance of a *remediation* or *reclamation* certificate.

#### **4.6 RESPONSIBILITIES OF PROFESSIONAL MEMBER AS CONTRIBUTING PROFESSIONAL**

As defined in the context of *reclamation* and *remediation*, the *contributing professional* has responsibility for conducting or preparing a portion of the *work* within the *project* as delegated by the *coordinating professional*. This could be a specialist area of technical expertise or a portion of the *work* of a non-specialized nature. In addition to the general responsibilities, the *contributing professional* is responsible for the following:

- A *contributing professional* who is retained for specialized skills shall accept responsibility for conducting *work* in that specialization at a professional standard of care and practice. There will, likely, not be any opportunity for other *professional members* to technically critique the *work* or recommendations of a *contributing professional*.
- The *contributing professional* must be vigilant in selecting a process or assembling a team to apply sufficient and appropriate knowledge.

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**4.7 TEAM STRUCTURE AND MANAGEMENT**

The organization of *reclamation/remediation work* varies according to the needs of the *project* and parties involved. These relationships may be structured in a number of configurations, depending upon the expertise of the *client/owner*, the complexity of the *project*, and the contractual agreements.

A generic model (see Figure 1) for the flow of authority and responsibility is included here as a reference, to provide the involved parties with general guidance in understanding the roles and responsibilities of each party. This is not intended to be an organizational chart for a project.

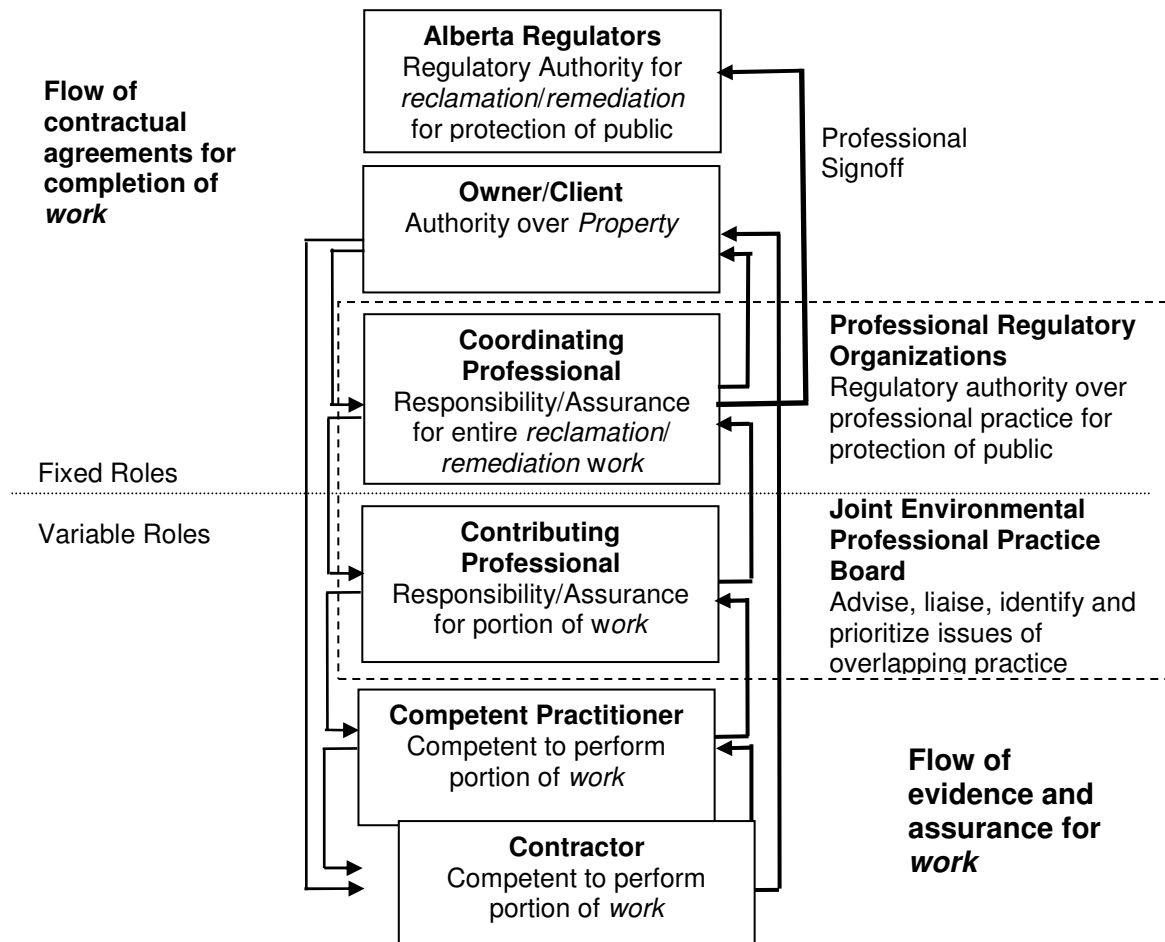


Figure 1 – An example of the flow of authority/responsibility for the completion and assurance of *reclamation/remediation work*

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#### **4.8 QUALIFICATION AND SELECTION OF PROFESSIONALS AND COMPETENT PRACTITIONERS**

The team of *professional members* and *competent practitioners* working on *remediation* and *reclamation* of a given *project*, together shall have the core knowledge and abilities as outlined in Appendix B.

##### **Selection of Coordinating Professional**

The *client* should select a *coordinating professional* with appropriate qualifications and experience based on the defined scope of *work*. The selection process should emphasize the capability to provide overall professional services, including design, contract administration and field review for the total *project*.

If the *client* selects a *coordinating professional* from in-house staff, the *client* should recognize that the *professional member* may be perceived to have a conflict of interest. Refer to Section 4.4 for a discussion on conflict of interest.

##### **Selection of Contributing Professionals**

*Contributing professionals* are selected based on the particular needs of the *project*. They may be selected by the *client* or *coordinating professional*. These *contributing professionals* must be evaluated with respect to their competence and capacity to undertake the assignment. *Contributing professionals* should be registered with a *professional regulatory organization* in the Province of Alberta, otherwise professional responsibility would rest with the *coordinating professional*.

##### **Selection of Competent Practitioners**

Components of the *work* may be completed by an individual who is not registered as a *professional member* with a *professional regulatory organization*. This individual (referred to as a "*competent practitioner*") must be chosen by a *professional member*, whether that *member* is the *client*, *coordinating professional*, or *contributing professional*. These *competent practitioners* must be selected based on their technical training and *work* experience relating to the portion of the *project work* being completed. The *professional member* who engages a *competent practitioner* is encouraged to maintain a record of the qualifications and *work* experience for that *competent practitioner* to demonstrate to the *coordinating professional*, *client*, or *regulators* that the individual has the capability to perform the *work*. The *professional member* who engages the *competent practitioner* shall accept professional responsibility for the *work* completed by the *competent practitioner*.

## **5 QUALITY AND RISK MANAGEMENT**

### **5.1 LIABILITIES, RISKS AND RESPONSIBILITIES**

The management of risk in undertaking *remediation* or *reclamation work* and applying for a *reclamation* or *remediation* certificate shall be a consideration in every *project*. Examples of potential *professional sign-off* liability exposure and potential limitations/remedies is given in Appendix C.

Liability risks may be controlled through an adequate quality management program involving organizational and operational considerations. Important elements and principles of such a management program include, but are not limited to, the following:

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- Well-developed objectives and scope.
- Developing the appropriate level of *DQOs*.
- Allowing for a process for scope changes and developing agreed-to progress milestones.
- A clear definition of the responsibilities of all *project* participants.
- Effective documentation and communication throughout the *project*.
- Securing and assigning suitably qualified staff and contract services.
- Ensuring that timelines are appropriate.
- Having adequate professional liability insurance coverage and ensuring sub-consultants and *contractors* carry adequate insurance coverage.

At some point in the *project*, the *owner* and/or *professional member* will determine that a *property* is *remediated* or *reclaimed* when a predetermined set of conditions is met. Conditions for adequate *project* completion would typically be met through the application of appropriate criteria to a data set in which the *professional member* is statistically confident in, or by using professional judgment. *DQOs* set up at the outset of a *project* will determine:

- when a data set is complete and what the confidence level is to be;
- when the desired end result of the data set has been achieved; and
- to what extent statistics will be used to determining the satisfactory completion of a *project* (i.e., to what extent professional judgment will be used in determining a *project* outcome has been met).

As any *project* is subject to evaluation against statistical confidence levels or matters of professional judgment, professional liability insurance is an important aspect of risk management for the *owner*, *client* and *professional members*. Professional liability insurance can be provided by comprehensive insurance acquired by the *client* or *owner*, or, more commonly, practice policies purchased by the professional firms offering professional services.

For a more detailed discussion of risk management, APEGGA members are referred to the APEGGA *Guideline for the Management of Risk in Professional Practice*.

### 5.2 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

*Project QA/QC* (an aspect of quality management) addresses both the management of the *project* and the product of the *project*. *QA* includes the documented processes required to ensure that the *project* will satisfy the needs for which it was undertaken and will meet the *project* specifications and *DQOs*. It also includes all activities of the overall management function that are required in meeting the objectives of the *project* including planning, *QC* elements, and any scope changes. The overall *QA/QC* program of the *project* will be the foundation upon which the *professional member* is to assure that the *work* is being, and has been, adequately performed and upon which to base his or her decision that the desired end results have been met.

The following are examples of *QA/QC* measures commonly employed in a *project*:

- A *project* management strategy (such as ISO).

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- Advance training of *professional members* and *competent practitioners* and use of an appropriate specialists.
- Peer support, consultation, technical advice and/or peer review by someone more qualified.
- Task-observed competency evaluations by someone more qualified.
- *Project* task supervision and performance audits.
- Performance audit by government *regulators* and/or supervisors.
- Use of standard field tests and assessment protocols, standard operating guidelines and procedures.
- Documentation and detailed record keeping of field *work*, sampling, testing, ongoing monitoring and decommissioning, sample storage and delivery, etc.
- Laboratory management and accreditation systems.

### 5.3 INTERPRETATIONS, ASSUMPTIONS, AND LIMITATIONS

Comprehensive and ongoing compilation, analysis, and interpretation of all data are essential activities throughout a *project*. These activities should be undertaken to assess the results of the *work* and validity of the data. Program changes should be made as data are evaluated. Changes in working hypotheses, objectives, or *work* programs should be agreed upon and documented.

The results of subsurface investigation should be presented in graphical format such as maps, plans, geologic cross-sections, fence diagrams, groundwater flow and quality plots, and aquifer test curves, etc., as appropriate. Data interpretation shall be based on all of the information collected. Technical reports should describe and document the basis of interpretation and discuss information that appears at variance with standard interpretation approaches. The adequacy of the collected data shall be critically assessed as to its ability to support any qualitative and quantitative conclusions that are reported. Full consideration of chemical characteristics and nature of the *contamination* in the given setting or environmental conditions shall be given in interpreting potential receptor effects.

Estimation or delineation of *contamination* and physical/chemical, geological, or hydrogeological properties are fundamental steps in *project* development. The methodology used for estimation or delineation and the associated uncertainties must be documented.

When cost estimates and *work* plans are provided, assumptions used in developing the cost estimate or approaches and any resulting limitations should be documented. The *client* and *regulators* should be apprised of the *project* limitations, as it may impact the quality of the *work* performed. Examples of limitations of Phase I and/or Phase II Environmental Site Assessment *work* may include, but are not limited to, the following:

- safety constraints,
- failure to detect,
- inadequate background information,
- errors by third parties,

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- delineation limited by budget, access and/or time,
- the site's nature and access and logistical constraints,
- failure to locate the impact source,
- other considerations such as environmentally sensitive areas, and
- operational limitations.

### 5.4 DOCUMENTATION

The *professional member* is responsible for documenting the findings of the *work* and/or *arms-length review* of the report. The format and style of the technical report or components of a larger report will vary depending upon the objectives and scope of the *work* program. The level of confidence that the *professional member* can make in determining that a site is free of impact can be influenced by the objectives and scope of *work*. The report must include all supporting information for the application for a *reclamation/remediation* certificate to the *regulators*. It shall be clearly written with sufficient detail to understand the supporting rationale for the conclusions and recommendations. The report should include the following:

- clearly stated objectives of the *work*;
- clear statement of whether there was *direct supervision* of the *work*, self-review, or *arms-length review*;
- sources of information reviewed;
- calculations, methodologies, and protocols;
- documented correspondence with other parties where clarification of significant aspects of the *work* prepared by other parties was required or where the *regulators* have provided guidance;
- clear conclusions and supporting rationale including documentation where and why professional judgment has been used in support of the *professional member's* conclusions;
- copy of any laboratory reports (and associated quality reports), surveys or supporting third party *work*;
- all conclusions are supported by the results;
- all recommendations are supported by the results and the conclusions; and
- statement of both the general and specific limitations of the report.

Following completion of the *work*, the *professional member* must indicate in writing all reports that were reviewed. These reports and copies of supporting documentation must be included with the *reclamation/remediation* certificate application. *Professional members* must retain complete copies of their review files for a minimum period of ten years, as per the *Alberta Limitations Act*.

### 5.5 DUE DILIGENCE AND REASONABLE CARE

*Professional members* are legally, ethically, and morally bound to safeguard the public, their employees, and the environment. *Professional members* must ensure that they have fulfilled these obligations through due diligence and reasonableness: "the diligence

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reasonably expected from, and ordinarily exercised by, a *person* who seeks to satisfy a legal requirement or to discharge an obligation."<sup>4</sup> Reasonable care is "a test of liability for negligence, the degree of care that a prudent and competent *person* engaged in the same line of business or endeavor would exercise under similar circumstances"<sup>5</sup> Due to their expert knowledge *professional members* are generally held to a higher standard of care when they apply that knowledge in a professional capacity.

A due diligence defense to claims against a *professional member* may be available through the use of a comprehensive and documented *QA/QC* plan which operates effectively under a quality management system. The confidence that a *professional member* can claim in assuring a site has met *remediation* or *reclamation* conditions will be influenced by the development of *project* scope and *DQOs*.

In summary, all *reclamation* and *remediation work* shall be conducted in a safe, professional manner in accordance with applicable regulatory requirements and with due regard for the natural environment and the concerns of *landowners* and local communities.

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4 Black's Law Dictionary, Second Pocket Edition. Bryan A. Garner, Editor in Chief, West Group, A Thomson Company, St. Paul, Minnesota, 2001.

5 Black's Law Dictionary, Second Pocket Edition. Bryan A. Garner, Editor in Chief, West Group, A Thomson Company, St. Paul, Minnesota, 2001.



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## APPENDIX A - REFERENCES

In Alberta, the assessment and clean-up of contaminated sites is primarily governed by a set of guidelines developed by the *regulators* in association with industry (e.g., CAPP, CPPI), consistent with the *Environmental Protection Act*. The guidelines and companion documents describing the assessment and *reclamation/remediation* procedures are available online at: <http://environment.gov.ab.ca/info> . Relevant guidance has also been published by the Canadian Council of Ministers of the Environment (CCME), the Canadian Standards Association (CSA), and other agencies. A partial listing of relevant documents is as follows:

- Alberta Tier 1 Soil and Groundwater Remediation Guidelines (Alberta Environment, June 2007)
- Alberta Tier 2 Soil and Groundwater Remediation Guidelines (Alberta Environment, June 2007)
- Upstream Oil and Gas Reclamation and Remediation Program – Fact Sheet R&R/06-01 (Alberta Environment, April 2006)
- Record of Site Condition (Alberta Environment, 2007 - draft)
- Reclamation Criteria for Wellsites and Associated Facilities - 1995 Update. (Alberta Environment, presently undergoing revision).
- Salt Contamination Assessment and Remediation Guidelines (Alberta Environment, 2001)
- Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment (CCME) (1998-2003, updated annually)
- Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites, Volumes I (Main Report) and II (Analytical Method Summaries) (CCME EPC\_NCS62E), December 1993.
- Subsurface Assessment Handbook for Contaminated Sites (CCME EPC\_NCSR\_48E), Ottawa: Canadian Council of Ministers of the Environment, March 1994.
- Phase I Environmental Site Assessment, CSA Standard Z768-94, Toronto: Canadian Standards Association, April 1994.
- Phase I ESA Interpretive Guideline, Ottawa: CMHC, The Canadian Mortgage and Housing Corporation, June 1994.
- Phase II Environmental Site Assessment, CSA Standard Z769-00, Toronto: Canadian Standards Association
- ISO 14010 Guidelines for Environmental Auditing: General Principles
- ISO 14012 Guidelines for Environmental Auditing: Qualifications for Environmental Auditors
- Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, ASTM Standard E 1527-94, Philadelphia, PA.: American Society for Testing and Materials, 1994.

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## **APPENDIX B – COMPETENCIES TABLES**

### **OVERVIEW**

The Competencies for Remediation and Reclamation Advisory Committee (CRRAC) initiated work in September, 2005. The Committee identified competencies required to conduct remediation and reclamation work, as a first step toward establishing a delegated "sign-off" process for site remediation and reclamation.

The Committee's work was initially focused on upstream oil and gas sites, but was expanded in mid-process to address the full range of remediation and reclamation sites. As a result, the Committee recommended competencies that have general application to all sites, and also provided an additional description of related tasks that are often required for successful reclamation of upstream oil and gas sites.

### **SUMMARY OF RESULTS**

The Committee produced a table that describes the tasks that must be completed in order to assure successful remediation and reclamation. As this report is submitted, this is the most comprehensive listing of tasks available.

In order to avoid repetition, the Committee identified the "givens" that must be in place to ensure competent completion of the tasks listed in the table. These "givens" were organized into three categories: context, core knowledge and abilities, and quality assurance. These "givens" are part and parcel of the tables and should always accompany the task listings in the tables. As the tasks were described, the Committee also identified any specific knowledge and experience required to ensure competent completion of the task.

### **USE OF THE COMPETENCY TABLES**

It is anticipated the competency tables will be used for the following:

- As a foundation for the development of a professional sign-off process and qualifications description;
- As a basis for hiring staff for reclamation and remediation work;
- As a basis for developing appropriate training and orientation for people doing reclamation and remediation work; and
- As a "checklist" supporting a government audit of the remediation/reclamation work.

**Note:** *It is not intended that all tasks must be done in every case, but rather that an auditor should ask whether a task was appropriate and, if so, whether it was completed in an acceptable manner.*

### **INTRODUCTION**

The following tables list the tasks and knowledge required for competent remediation and reclamation of sites in Alberta. The introductory sections— Context, Core Knowledge and Abilities, and Quality Assurance—are integral to the tables that follow and are part and parcel of the competency listing.

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**CONTEXT**

The list of competencies that follows must be interpreted within the following context:

- The process is multi-disciplinary and is usually carried out by a project team. This document addresses the competencies of the project team, which are the sum of the skills of the individual practitioners. Generally, one practitioner will not have all of the skills.
- Many field practitioners are learning the work on the job and are paired with more experienced practitioners to aid the learning process.
- Remediation and reclamation tasks and competencies apply to activities on agricultural and natural lands, as well as residential, industrial and commercial sites (which are often in urban settings).
- The majority of sites can be addressed without specialized approaches. It is essential, however, that the team is able to recognize the minority of sites that do require specialized approaches. Unique biophysical, chemical, geotechnical or hydrologic circumstances may require the practitioners to use specialized knowledge and approaches.
- Conservation success is closely linked to initial construction and operation practices used on the site, especially when agricultural or natural land is converted to industrial use. Competencies associated with this are described in attachment 1.
- Communication with the landowner/occupant, client and regulator during the entire process is very important to the success of the result (especially if there are special requirements on site, or adjacent land uses that require special consideration).
- Record keeping is important to support the accountability of the sign-off process.
- Professional organizations play a critical role in improving public acceptance of remediation and reclamation practices in Alberta.
- All practitioners working on remediation and reclamation must have appropriate safety training.
- The following tables recognize that remediation and reclamation activities focus on these primary media: soil, surface water, groundwater.
  - Reclamation objectives vary by site end use (addressed in the tables). Examples include revegetation and geotechnical considerations.
  - Air quality may also be a consideration (not addressed in the tables).

**CORE KNOWLEDGE AND ABILITIES**

The team of practitioners working on remediation and reclamation of a given site must have the following core knowledge and abilities, in addition to specific technical knowledge:

- Knowledge of the legislation, regulations and guidelines, or approval-specific requirements that apply to remediation and reclamation work.
- Knowledge of information sources relevant to the site that could affect remediation and reclamation success.
- Ability to prepare reports and documents as necessary. Review of reports to ensure accuracy, clarity and completeness.
- Knowledge of remediation/reclamation process and protocols.

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- Ability to read and understand survey and map information.
  - Communication skills (ability to communicate with landowner, client, contractors and regulators).
  - Team skills (project management, shared goals, team make-up, team operations, shared knowledge of accountability of other team members trust,
  - Knowledge of physical, chemical and biological processes and their interaction.

### QUALITY ASSURANCE

The following tables are based on the requirement that a practitioner leading remediation and reclamation must have acceptable education and experience relevant to the task. In some cases (where noted), specific professional qualifications will be required. Quality assurance is an important aspect of the work. The following quality assurance measures will be commonly employed:

- Advance training that alerts practitioners to the most common situations they will face during reclamation activities, and also to the situations that will most likely require reference to a specialist.
- Peer support and consultation: Less experienced practitioners will be given support such as on-site coaching, a "second opinion" or peer review by more qualified practitioners.
- Task-observed competency: Learning practitioners should be observed by a qualified practitioner (i.e. someone already accepted as having the necessary competency) and verified as having the skills to perform the reclamation/remediation task. It is assumed that verification would be applicable for each of the identified reclamation/remediation stages.
- Performance audit by supervisor: Sufficient review of work by supervising practitioner to determine whether the reclamation/remediation work has been adequately performed.
- Performance audit by government regulator: Government regulator review/audit of written reports is intended to assure that work has been adequately performed.
- Use of standard field tests and assessment protocols; use of standard tests by accredited laboratories to ensure that test results are accurate and repeatable. *Competencies required for analysis and reporting of laboratory data are largely addressed through laboratory accreditation (CAEL, SSC, AIHA).*
- Selection of appropriate practitioners for the task. Referral to specialists when the situation requires specialized knowledge.

**Qualifications = Experience + Education + Training**

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**REMEDICATION AND RECLAMATION COMPETENCIES****PHASE I ENVIRONMENTAL SITE ASSESSEMENT (ESA)**

<b>Tasks</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
<p>Obtain, review and interpret site history (must know infrastructure types and types of contamination that could result):</p> <ul style="list-style-type: none"> <li>▪ Facilities and infrastructure</li> <li>▪ Process flow diagrams</li> <li>▪ Chemicals handled and stored</li> <li>▪ Waste streams (chemicals applicable)</li> <li>▪ Potential emission sources</li> <li>▪ Research site operational records (include regulatory records)</li> <li>▪ Research site historical information (e.g. air photos, maps, land titles, surveys, municipal records)</li> <li>▪ Interview practitioners with potential knowledge about site</li> <li>▪ Document adjacent land use: potential receptors, potential sources of contamination</li> </ul>	<ul style="list-style-type: none"> <li>▪ Practitioner must have task-related knowledge and experience (or supervision)</li> <li>▪ Knowledge and experience regarding risks associated with evidence of contamination (particularly the equipment, infrastructure and practices associated with them)</li> <li>▪ Familiarity with chemical fate and transport in soil and groundwater</li> </ul>	<ul style="list-style-type: none"> <li>▪ Determining Phase II requirement requires a qualitative evaluation of risk</li> </ul>
<p>Site reconnaissance must be undertaken to:</p> <ul style="list-style-type: none"> <li>▪ Identify any surficial evidence of contamination</li> <li>▪ Assess potential contamination risks on-site</li> <li>▪ Confirm status of any remaining equipment or infrastructure</li> <li>▪ Identify potential receptors</li> <li>▪ Document adjacent land use: potential receptors, potential sources of contamination</li> </ul>		
<p>Determine whether a Phase II ESA is necessary</p>		
<p>If remediation has occurred, then assess laboratory findings and confirm effectiveness of remediation</p>		

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**PHASE II ENVIRONMENTAL SITE ASSESSMENT (ESA) (IN ADDITION TO PHASE I ESA COMPETENCIES)**

<b>Tasks*</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
Review and interpret Phase I ESA	<ul style="list-style-type: none"> <li>▪ Knowledge of distribution, fate and potential migration of contaminants in the environment               <ul style="list-style-type: none"> <li>▫ Ability to recognize potential for groundwater impact</li> </ul> </li> <li>▪ Knowledge of tools, specialists available and data objectives</li> <li>▪ Knowledge of, and experience with, investigation and sampling methods</li> <li>▪ Ability to determine data quality objectives and assess whether they are met</li> <li>▪ Recognition of increased potential risk, liability and off-site considerations in urban areas</li> </ul>	<p>Team must include practitioners with an appropriate range of skills, matched to the site requirements.</p> <p>Certain tasks may require a higher degree of specialization.</p> <p>Practitioners will identify when additional specialized knowledge (not already included in the team) is required.</p> <p>There may be higher level data quality objectives in urban sites depending on site sensitivity</p>
Design a plan to locate, delineate and quantify contaminants on and off site <ul style="list-style-type: none"> <li>▪ Soil and stratigraphy</li> <li>▪ Surface water</li> <li>▪ Shallow groundwater</li> <li>▪ Aquifer</li> </ul> <p><i>All following tasks assume this full range has been addressed.</i></p>		
Identify complex versus simple situations Involve <b>appropriate specialists</b> in the design and implementation of sampling if observations cannot be readily explained or bounded		
Oversee implementation of sampling, maintenance of sample integrity, and testing of samples		
Involve <b>appropriate specialists</b> in the interpretation of analytical data (This may include an assessment of laboratory analysis)		
Interpret site conditions, results of chemical analyses, and fate and transport of chemicals		
Risk and receptor evaluation to determine portion of site that: <ul style="list-style-type: none"> <li>▪ Meets generic guidelines</li> <li>▪ Warrants site-specific objectives</li> <li>▪ Requires remediation</li> </ul>		
Risk and receptor evaluation to determine potential off-site effects		

\* There are frequently two stages:

- (1) assessment or confirmation of contamination issues, and
- (2) complex delineation and supplemental Work in support of a Remediation plan (soil and/or ground water, indicator plant species).

The second stage requires more specialized competencies (see notes above).

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**REMEDIATION**

<b>Tasks*</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
Address concerns related to: <ul style="list-style-type: none"> <li>▪ Soil and stratigraphy</li> <li>▪ Surface water</li> <li>▪ Shallow groundwater</li> <li>▪ Aquifer</li> </ul>	<ul style="list-style-type: none"> <li>▪ Knowledge and experience with fate and effects of contaminants</li> <li>▪ Know and understand scientific basis of remedial methods and suitability for contaminants present</li> <li>▪ Awareness of cost-effectiveness of technologies for specified applications</li> <li>▪ Ability to identify need for specialists</li> </ul>	<p>Team must include practitioners with an appropriate range of skills, matched to the site requirements.</p> <p>Certain tasks may require a higher degree of specialization.</p> <p>Practitioners will identify when additional specialized knowledge (not already included in the team) is required.</p>
Risk and receptor evaluation to determine portion of site (or environmental media) that: <ul style="list-style-type: none"> <li>▪ Meets generic guidelines</li> <li>▪ Warrants site-specific objectives (risk assessment)</li> <li>▪ Requires remediation</li> <li>▪ Requires risk management (ongoing)</li> </ul>		
Conduct risk assessment if appropriate: <ul style="list-style-type: none"> <li>▪ Ecological</li> <li>▪ Human health</li> </ul>		
Determine suitable technologies for remediation (timeframe, cost, effectiveness, emissions, legislative requirements and authorizations)		
Compose a remediation plan (define outcomes; identify and respond to stakeholder concerns; define sequence of activities for appropriate remediation; manage emissions; establish monitoring and confirmatory requirements)		
Identify requirement for appropriate specialists		
Develop a risk management plan where appropriate (not applicable for reclamation certificates)		
<p><b>Implementation of Remediation Measures:</b></p> <ul style="list-style-type: none"> <li>▪ Interpret, and comply with, remediation plan</li> <li>▪ Adapt plan if required (may include reporting back to remediation planner)</li> <li>▪ Confirm results through sampling</li> <li>▪ Keep written and photographic records of remediation activities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Has experience with remediation technology and equipment</li> <li>▪ Has expertise in relevant waste management</li> <li>▪ Able to recognize potential changes in scope of remediation</li> </ul>	

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**RECLAMATION**

<b>Tasks</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
Identify end land use and stakeholder concerns	<ul style="list-style-type: none"> <li>▪ Knowledge of, and experience with, equipment operations and limitations</li> <li>▪ Knowledge of, and experience with, terrain, soil, drainage (soil water holding) and vegetation interaction</li> <li>▪ Knowledge of, and experience with, land use issues (weed management, natural recovery, appropriate revegetation, etc.)</li> <li>▪ Knowledge of, and experience with, historic construction and operation practices</li> <li>▪ Knowledge of current reclamation methods and ability to select appropriate method for environmental conditions and end land use</li> <li>▪ Able to identify issues that require specialist intervention</li> <li>▪ Knowledge of soil, water, vegetation, topography, and the interaction between these parameters, and the operational requirements to address them</li> </ul>	<ul style="list-style-type: none"> <li>▪ May have to segregate the qualifications and competencies as they are related to specific task/activity</li> <li>▪ On-site and off-site comparative observations and parameters are used as an indicator (contrasts must be explained)</li> <li>▪ Test results from qualified laboratories</li> <li>▪ On urban sites, geotechnical engineering is a common concern</li> <li>▪ Vegetation concerns are more likely on rural sites</li> </ul>
Assess site and resources (e.g., salvaged reclamation materials) that affect reclamation options		
Interpret existing site information (e.g., pre-construction site assessment, existing environmental information, soil survey, etc.)		
Create a reclamation plan (describe order of work and work options, treatment of soils, revegetation strategy, and contingencies for problem site conditions such as sub-surface and surface drainage)		
Supervise equipment operations where necessary		
Assess adjacent topography, infrastructure and drainage in relation to site		

**Note: Reclamation means:**

For "specified lands" (EPEA): returning the site to equivalent land capability, as referenced in current standards.

For urban and industrial sites: putting the site into a state suitable for future redevelopment.



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**POST-RECLAMATION SITE ASSESSMENT**

<b>Tasks</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
Determine if land use objectives and stakeholder concerns are addressed	<ul style="list-style-type: none"> <li>▪ Ability to interpret land use characteristics and limitations/ sensitivities relevant to the objectives</li> <li>▪ Ability to discriminate and describe soil, vegetation and terrain conditions</li> <li>▪ Knowledge of, and experience with, sampling protocols and statistics and media (soil, water, indicator plant species, etc.)</li> <li>▪ Knowledge of natural variability and the ability to determine third party impacts</li> </ul> <p><i>An understanding of past, present and potential future objectives may be needed</i></p>	<ul style="list-style-type: none"> <li>▪ Objectives may be time-sensitive</li> </ul>
Develop appropriate sampling plan		
Conduct and record sampling		
Assess site conditions		
Evaluate site results and interpret against objectives, regulations and policies		

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### **RELATED TASKS THAT MAY AFFECT RECLAMATION SUCCESS**

Conservation success is closely linked to initial construction and operation practices used on the site. These practices are usually conducted by other parties long before reclamation and remediation takes place, so are not typically the responsibility of remediation and reclamation practitioners. The practices that are most likely to affect conservation success are included in the following tables, however, because these practices are relevant to reclamation and remediation processes. Conservation practices listed below will not be "signed off" by professionals, as specific practices can rarely be confirmed after the fact.

Choice of site location prior to original construction can simplify the later success of reclamation and remediation by identifying and addressing sensitive landforms, soils, land uses, water bodies or habitat issues. Remediation and reclamation practitioners must be able to identify and deal with such complications, but there is no "sign off" on previous location planning.

Communication with the landowner/occupant, client, contractors and regulators during the entire process is very important to the success of the result (especially if there are special requirements on site, or adjacent land uses that require special consideration).

Core competencies for the following tasks are defined in Core Knowledge and Abilities (see main recommendations paper).

### **SITE LOCATION**

<b>Tasks</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
<ul style="list-style-type: none"> <li>▪ Identify restrictive landforms, water bodies or habitat issues that affect site location</li> <li>▪ Create a plan to avoid these "sensitive" areas</li> <li>▪ Interpret environmental regulations and policies that affect site location</li> <li>▪ Create a site layout map</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ability to identify potential complexities or limitations as a result of direct observation of landscape characteristics</li> <li>▪ Ability to interpret requirements of environmental regulations and policies</li> <li>▪ Preparatory research and field scouting experience</li> </ul>	<ul style="list-style-type: none"> <li>▪ Most upstream sites are straightforward; a minority require more specialized assessment</li> </ul>

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**PRE-CONSTRUCTION SITE ASSESSMENT**

<b>Tasks</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
<ul style="list-style-type: none"> <li>▪ Assess landscape and determine limitations for facility, access and activity locations (limitation includes legislative and physical concerns, including sensitive sites)</li> <li>▪ Assess landscape and soil conditions prior to disturbance (i.e.. soil characteristics* for construction handling and reclamation, drainage considerations for construction and reclamation)</li> <li>▪ Choose or design soil handling procedure (Note that design means a site-specific approach is needed, rather than a typical approach)</li> <li>▪ Determine whether specialized assessment is required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Knowledge of the range of variance in Alberta soils (normal geophysical range by region and variants that have been noted. Especially problem soil conditions)</li> <li>▪ Experience with specialized soil and drainage requirements and regional variances</li> </ul>	

**CONSTRUCTION PLANNING AND SUPERVISION**

<b>Tasks</b>	<b>Knowledge and Experience</b>	<b>Notes</b>
<ul style="list-style-type: none"> <li>▪ Prepare/interpret a soil handling and site drainage plan</li> <li>▪ Identify specialized requirements and equipment</li> <li>▪ Determine best option to conserve soil and habitat/growing capability</li> <li>▪ Identify sump and deep subsoil issues and recommend ways to mitigate impacts</li> <li>▪ Determine need for, and direct implementation of, contingency plan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Knowledge of soil, water, vegetation, topography, and the interaction between these parameters, and the operational requirements to address them</li> <li>▪ Understands environmental limitations and can direct best response to these limitations (soil type, soil moisture conditions at handling, winter soil)</li> <li>▪ Understanding of capabilities and limitations of equipment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training or on-site coaching in proper soil handling</li> <li>▪ Refer to best management practices</li> </ul>

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**DEVELOPMENT, OPERATIONS, ABANDONMENT ACTIVITIES**

Tasks	Knowledge and Experience	Notes
<ul style="list-style-type: none"> <li>▪ Direct activities to minimize site disturbance during abandonment</li> <li>▪ Document evidence of potential contamination and hazards</li> <li>▪ For upstream oil and gas sites: ensure soil reserve is protected (documentation, protective measures)</li> <li>▪ Determine appropriate waste disposal</li> </ul>	<ul style="list-style-type: none"> <li>▪ Knowledge of, and experience with, identifying evidence of contamination (including the equipment, infrastructure and practices associated with them)</li> </ul>	

**Notes:**

- EIA requirements must be addressed where applicable.
- The above tables have been constructed primarily to address upstream oil and gas activities where construction is provincially regulated. The tables may also be applied in part, or in whole, to urban and industrial areas where site development falls within local development approvals.

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**APPENDIX C - FREQUENTLY ASKED QUESTIONS REGARDING  
RECLAMATION/REMEDICATION SCENARIOS AND THE ASSOCIATED  
LIABILITIES**

The scenarios and comments herein are general only. They do not constitute legal advice. It is a highly complex area, so each situation must be assessed on its own facts and independent legal advice is recommended. As with other areas of professional malpractice, although the general principles apply to each profession, there are specific duties and standards, and *professional members* should consult with their own *professional regulatory organizations*.

<b>Scenario</b>	<b>Associated Liabilities</b>
<p>1. During site remediation activities under supervision and control of <i>professional member</i>, an onsite pipeline is ruptured.</p>	<p>As per Section 107(1) of the <i>Environmental Protection and Enhancement Act</i> (APEA), Alberta Environment (AENV) holds the owner/operator/polluter responsible for contamination and its clean-up. Further, Section 107(1)(c)(viii) states that "a person who investigates or tests a parcel of land for the purpose of determining the environmental condition of that parcel, unless the investigation or test releases on that parcel a new or additional substance into the environment that may cause, is causing, or has caused an adverse effect or aggravates the adverse effect of the release of a substance into the environment on that parcel will not be held responsible for the contaminated site.</p> <p>Therefore, should a <i>professional member</i> cause contamination or the release of contamination, then he or she would be responsible for the immediate reporting of the release and the clean-up of that contamination.</p>
<p>2. AENV has granted a remediation certificate, and within 10 years of issuance of the certificate AENV subsequently completes an onsite inspection as part of a field audit. AENV finds that site does not appear to meet the applicable remediation criteria.</p>	<p>This file would be referred to AENV investigators for an investigation. As part of the investigation, the investigator will contact the Remediation Certificate Holder. AENV action will depend upon the facts of the situation, which would include and the seriousness of any contamination found, and whether false or misleading information was provided. The responses may range from allowing the Certificate to stand if the contamination is very minor, to canceling the Certificate and requiring additional remedial work if more serious problems are discovered.</p> <p>An Environmental Protection Order may be issued if any of the substances specified in the remediation certificate are present in the remediated zone and exceed the applicable criteria in place at the time that the remediation certificate was issued.</p>

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	<p>If the Certificate Holder had relied upon a <i>professional member</i> in making the original Application for the remediation certificate, there may be issues of civil liability and or professional disciplinary issues with that <i>professional member's professional regulatory organization</i>.</p>
<p>3. AENV reviews risk management plan on the understanding that there is no off-site migration of the contaminant plume. No remediation certificate is issued. Twelve years later, it is discovered that the plume has indeed migrated off site.</p>	<p>With risk management plans, the operator retains liability. However, if the risk management plan, as developed by a consultant is deficient, then there is potential for civil liability. The <i>Alberta Limitations Act 1999</i> sets time limits for civil claims (lawsuits). The 'discovery rule' states that civil claims must be brought forward within two years from the date the claimant knew or ought to have known that the breach occurred. The 'drop dead rule' states that civil claims must be brought forward within ten years when the claim arose. There is no limitation period on regulatory liability. Despite these statutorily defined limitation periods, a mechanism exists under EPEA that may permit the extension of the civil claim limitation periods.</p> <p>Polluter pay is key part of AENV's Compliance Assurance Principles and would be used to determine who, if anyone, bears regulatory responsibility (as opposed to civil responsibility) for the migrating contaminant plume.</p>
<p>4. AENV issues a remediation certificate for a property. Twelve years later, it is discovered that there is contamination and the contaminant plume has migrated off site.</p>	<p>This file would be referred to AENV investigators for an investigation. As part of the investigation, the investigator will contact the Remediation Certificate Holder. AENV action will depend upon the facts of the situation, which would include the seriousness of any contamination found, and whether false or misleading information was provided. The responses may range from allowing the Certificate to stand if the contamination is very minor, to canceling the Certificate and requiring additional remedial work if more serious problems are discovered.</p> <p>An Environmental Protection Order (EPO) may be issued if any of the substances specified in the remediation certificate are present in the remediated zone and exceed the applicable criteria in place at the time that the remediation certificate was issued.</p> <p>If the Certificate Holder had relied upon a <i>professional member</i> in making the original Application for the remediation certificate, there may be issues of civil liability and or professional disciplinary issues with that <i>professional member's professional regulatory organization</i>.</p> <p>As above, the <i>Alberta Limitations Act 1999</i> sets time limits</p>

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	<p>for civil claims (lawsuits). Despite these statutorily defined limitation periods, a mechanism exists under EPEA that may permit the extension of the civil claim limitation periods.</p> <p>Polluter pay is key part of AENV's Compliance Assurance Principles and would be used to determine who, if anyone, bears regulatory responsibility (as opposed to civil responsibility) for the migrating contaminant plume.</p>
<p>5. An Operator obtains a remediation certificate for a site. Within 10 years of the issuance of the certificate contaminants from an adjacent known or unknown contaminated site migrates onto the area that is subject of the certificate.</p>	<p>This file would be referred to AENV investigators for an investigation. As part of the investigation, the investigator will contact the person responsible for the adjacent contamination and Remediation Certificate Holder. AENV action will depend upon the facts of the situation, which would include the seriousness of any contamination found, and whether false or misleading information was provided. The responses may range from allowing the Certificate to stand if the contamination is very minor, to canceling the Certificate and requiring additional remedial work if more serious problems are discovered.</p> <p>An Environmental Protection Order may be issued to any person that causes a change in the condition of the remediated area or zone, which may cause, is causing or has caused an adverse effect.</p> <p>If the contamination was caused by another, the operator could bring a civil claim against that person subject to applicable limitation periods (see #3 above).</p>
<p>6. The Operator engages a Consultant to do Phase II assessment, quality assurance, and signoff. Operator engages a Contractor to do the fieldwork. Contractor does not follow the <i>professional member's</i> recommendations, but the Operator wants <i>professional member</i> to sign-off on the work, regardless.</p>	<p>"Professional Sign-Off" means the application of the <i>professional member's</i> stamp or seal or member number, signature, and date to a plan, report, map, or any other form of document indicating that the <i>professional member</i> has supervised and/or reviewed the remediation or remediation of the property, that the property has been reclaimed or remediated to an acceptable standard, and that the <i>regulators</i> may rely upon the <i>professional member's</i> reported information and issue a Remediation certificate for the property. If a <i>professional member</i> signs off on a property, knowing that the property does not meet the standards, that member may be subject to disciplinary action by their <i>Professional Regulatory Organization</i> and/or civil liability.</p> <p>If a matter of this nature came to AENV's attention, investigators would determine if there was evidence to support the provision of false and misleading information under EPEA or fraud under the Criminal Code.</p>

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<p>7. The Operator engages a <i>professional member</i> to remediate a number of sites within a very restricted budget. The <i>professional member</i> questions whether the budget is sufficient to properly characterize the site and complete the work.</p>	<p>The <i>professional member</i>, regardless of his or her role in the scope of work, has the primary duty for protection of the public. Before any work starts, the scope of work and the deliverables for the work/project must be defined and agreed to. It is recommended that there be a written agreement between the client and the <i>professional member</i> confirming the scope, compensation and schedule for the services. If a <i>professional member</i> signs off on a property, knowing that the property does not meet the standards, that member may be subject to disciplinary action by their Professional Organization and/or civil liability.</p> <p>If a matter of this nature came to AENV's attention, investigators would determine if there was evidence to support the provision of false and misleading information under EPEA or fraud under the Criminal Code.</p>
<p>8. A professional consulting firm takes out professional liability insurance (PLI) to cover the firm and its employees. The project manager for the remediation that is the subject of an application for a remediation certificate, or that has been issued a remediation certificate, subsequently leaves the firm.</p>	<p>If the consulting company continues its PLI, the company's coverage would generally cover the work of former employees completed while under the employ of the company. However, it is recommended that every professional carry his or her own PLI for previous work completed as relying on past employers to maintain PLI coverage may not be prudent since: other claims against the company may erode the company's limit, the company may discontinue coverage, or the company may dissolve. Any new employer's PLI coverage would not cover the professional's previous work.</p> <p>It is also recommended that the professional maintain PLI for a reasonable period after retirement. APEGGA has a secondary PLI program that covers past professional services, which is automatically available to all members of APEGGA. Other <i>professional members should discuss their options with their Professional Regulatory Organization</i> and insurance provider.</p>
<p>9. A <i>professional member</i> submits a report to AENV in conjunction with an application for a remediation certificate. Someone makes an application under freedom of information legislation (<i>Freedom of Information and Protection of Privacy Act</i>) to obtain a copy of the</p>	<p>The report was prepared for the operator in support of the operator's application for a remediation certificate as such the operator and AENV may rely on the report. Although a third party, such as a subsequent purchaser, may obtain a copy of the report and rely on it, the third party would do so at their risk provided the report contained a properly worded disclaimer of third party liability.</p> <p>Third parties are responsible for conducting their own due diligence. Limitation of third party liability language on the report and/or the site registry should notify other third parties</p>



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<p>report and it ends up in the public domain. A member of the public relies on the report to purchase the property.</p>	<p>to complete their own due diligence.</p>
<p>10. Purchaser buys a property with a remediation certificate, and assumes that the remediated area is "clean". However, in developing the site, the purchaser discovers contamination of the type and location supposedly covered by the remediation certificate.</p>	<p>This file would be referred to AENV investigators for an investigation. As part of the investigation, the investigator will contact the Remediation Certificate Holder. AENV action will depend upon the facts of the situation, which would include and the seriousness of any contamination found, and whether false or misleading information was provided. The responses may range from allowing the Certificate to stand if the contamination is very minor, to canceling the Certificate and requiring additional remedial work if more serious problems are discovered.</p> <p>A Remediation Certificate provides closure of liability against changing standards. An EPO cannot be issued 10 or more years after the date a remediation certificate was issued for specific substances that were remediated in accordance with the guidelines if the standards become more stringent.</p>
<p>11. Following the issuance of a remediation certificate, a developer purchases a commercial property and following rezoning, it is developed for residential use.</p>	<p>The developer would be responsible to undertake additional remediation to ensure the property meets the current guidelines/standards for residential land use. An EPO can be issued to anyone who changes the use of the remediated area in such a manner that the substance present within the remediated zone may cause, is causing or has caused an adverse effect.</p>
<p>12. A <i>professional member</i> issues a report, relying on the reports of a subconsultant to support the issuance of a remediation certificate. The remediation certificate is issued. Later, within 10 years of the issuance of the certificate, it is found that the subconsultant's work was deficient.</p>	<p>From a regulatory perspective and depending on effect of the subconsultant's deficient work, AENV could cancel the certificate. There may be issues of civil liability between the operator, consultant, and subconsultant. It's recommended that consultants receive copies of subconsultants' insurance coverage to ensure that it's at least equivalent to the insurance carried by the primary consultant. If the remediation certificate were cancelled, AENV's Investigators would determine if there was evidence to support the provision of false and misleading information under EPEA or fraud under the Criminal Code, when the remediation certificate was originally applied for.</p>
<p>13. An application for a remediation certificate is submitted to AENV and</p>	<p>AENV may reject the application. In that case, the operator would have to re-apply with a new fee.</p>

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the application is incomplete.	
14. A remediation certificate is issued based on an application regarding the remediation that was undertaken. A later site audit by AENV reveals that the remediation was not actually done.	This matter would be referred to AENV Compliance for investigation. If this specific situation occurred AENV's investigators would determine if there were evidence to support the provision of false and misleading information under EPEA or fraud under the Criminal Code, when the remediation certificate was originally applied for. Depending on the evidence, the investigation may be followed by a variety of enforcement options, including orders, prosecutions or administrative penalties.
15. A person (member of the public, the <i>regulators</i> , or <i>operator</i> ) complains that a <i>professional member</i> has acted in an unskilled or ethical manner.	Each <i>professional regulatory organization</i> is responsible for investigating any complaints of unskilled or unethical practices by their members. Substantive complaints would typically be referred to a discipline process of the applicable <i>professional regulatory organization</i> . These discipline processes may result in the <i>professional member</i> being subject to any of: reprimand, suspension or cancellation of registration, limited practice, and/or imposition of conditions (practicing under supervision, permit periodic inspections and practice reviews).

**Alberta Institute of Agrologists (AIA)**

170, 2257 Premier Way  
Sherwood Park, AB T8H 2M8  
Telephone: 780-464-9797  
Fax: 780-464-1171  
Internet: [www.aia.ab.ca](http://www.aia.ab.ca)  
Email: [PAg@aia.ab.ca](mailto:PAg@aia.ab.ca)

**Alberta Society of Professional Biologists (ASPB)**

P.O. Box 21104  
Edmonton, AB T6R 2V4  
Telephone: (780) 434-5765  
Fax: (780) 413-0076  
Internet: [www.aspb.ab.ca](http://www.aspb.ab.ca)  
Email: [pbiol@aspb.ab.ca](mailto:pbiol@aspb.ab.ca)

**Association of the Chemical Profession in Alberta (ACPA)**

P.O. Box 21017  
Edmonton, AB T6R 2V4  
Telephone: 780 413-0004  
Fax: 780-413-0076  
Internet: [www.pchem.ca](http://www.pchem.ca)

**The Association of Professional Engineers, Geologists  
and Geophysicists of Alberta (APEGGA)**

1500 Scotia One, 10060 Jasper Avenue  
Edmonton, AB T5J 4A2  
Telephone: (780) 426-3990  
Fax: (780) 426-1877  
Toll Free (within North America): 1-800-661-7020  
Internet: [www.apegga.com](http://www.apegga.com)

**College of Alberta Professional Foresters (CAPF)**

200, 10544 - 106 Street  
Edmonton, AB T5H 2X6  
Telephone: 780-432-1177  
Fax: 780-432-7046  
Internet: [www.professionalforesters.ab.ca](http://www.professionalforesters.ab.ca)  
Email: [office@professionalforesters.ab.ca](mailto:office@professionalforesters.ab.ca)

**College of Alberta Professional Forest Technologists (CAPFT)**

#200, 10544-106 Street  
Edmonton, AB T5H 2X6  
Telephone: 780-432-1962  
Fax: 780-432-4183  
Internet: [www.forestechs.ab.ca](http://www.forestechs.ab.ca)  
E-mail: [capft@forestechs.ab.ca](mailto:capft@forestechs.ab.ca)