

Agrology Practice Standards

- Assessment, Remediation and Management of Contaminated Land
- Land Reclamation



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The Profession of Agrology

Section 1(1v) of the *Agrology Profession Act* (APA 2005) defines the practice of agrology as,

- *the development, acquisition or application of or advising on scientific principles and practices relating to the cultivation, production, utilization and improvement of plants and animals and the management of associated resources and includes...*”
 - *The analysis, classification and evaluation of land and water systems,*
 - *The conservation, decommissioning, reclamation, remediation and improvement of soils, land and water systems,*
 - *Etc, etc.*

AIA: Regulating the Profession of Agrology

The Alberta Institute of Agrologists is a Professional Regulatory Organization (PRO).

Difference between a PRO and an Association/Society:

- PRO: Created by government via legislation to protect public interest.
- Association/Society: Created by members to further member interests.
- Example:
 - College of Physicians and Surgeons is a PRO (regulatory mandate; focus on public interest);
 - Alberta Medical Association is an association (focus on member's interests);

The *Agrology Profession Act (APA; 2005)* and the *Agrology Profession Regulation (APR; 2007)* established AIA as a PRO; no part of the *APA* or *APR* allows for association activities.

Professional regulatory management is based on the premise that the best persons to regulate a profession are practitioners within that profession who understand what it means to be competent in that profession.



Seven Pillars of Professional Regulation

- Entrance Standards
- Continuing Competence Program
- Code of Ethics
- **Practice Standards**
- Practice Reviews
- Errors and Omissions Insurance
- Complaints Handling Protocol

Agrology Profession Act

The Institute's role is defined in Section 3 of the *Agrology Profession Act*.

Section 3 "Institute's Role" states:

3(1) The Institute must

(a) carry out its activities and govern its regulated members in a manner that **protects and serves the public interest,**

(b) **provide direction to and regulate the practice of agrology** by its regulated members,

(c) **establish, maintain and enforce standards of practice**, registration and continuing competence for the practice of agrology,

(d) establish, maintain and enforce a code of ethics, and

(e) carry on the activities of the Institute and perform other duties and functions by the exercise of the powers conferred by this Act.



Practice Areas (PAs)

- Unique areas of practice that define the scope of the Agrolgy profession in Alberta.

- 19 PAs in total = 17 technical PAs + 2 non-technical PAs

- Agricultural and Natural Resource Economics

- Agricultural Greenhouse Gas Assessment and Management

- Agricultural Marketing and Sales

- Animal Production

- Assessment, Remediation and Management of Contaminated Lands

- Biophysical Classification and Evaluation

- Biosystems, Biosolids, Compost and Manure Management

- Crop Production

- Environmental Impact Assessment and Mitigation Planning

- Environmental Monitoring

- Food Development and Processing

- Land Conservation and Management

- Land Reclamation

- Management

- Rangeland and Pasture Management

- Regulatory Support and Consultation

- Rural Development and Support

- Water Resources Planning and Management

- Wetland and Riparian Areas

Practice Standard Completed

Practice Standard in Development



Establishment of Practice Area Expert Committees (PAECs)

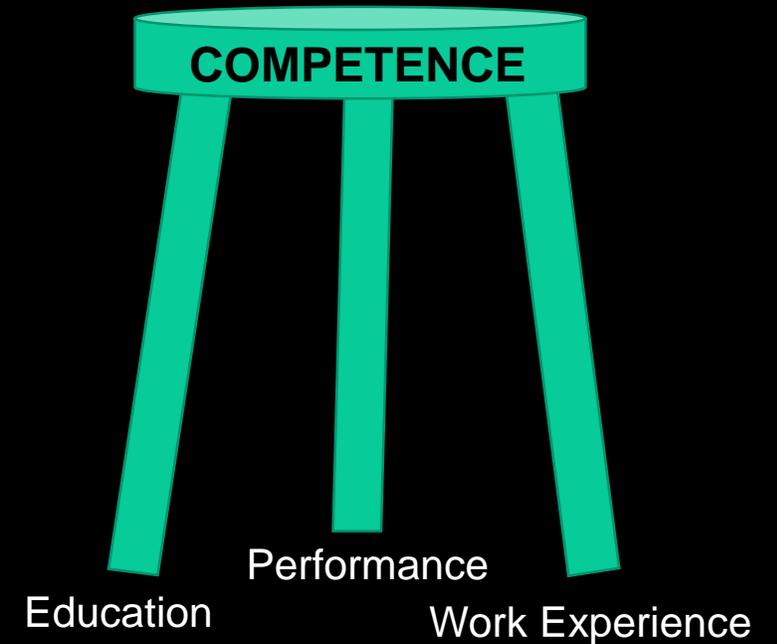
- PAECs consist of senior practitioners with a wealth of experience within their area of practice.
- Objectives:
 - To explore the scope of a Practice Area and clearly define what it is and identify the core activities involved.
 - To identify and document knowledge requirements and expectations for professionals who practice within that Practice Area.
- Deliverable:
 - Practice Standard document for the Practice Area

What Is A Practice Standard?

A Practice Standard defines what is required of a practitioner in order to become fully functional within a Practice Area.

A Practice Standard consists of three primary components:

- education requirements
 - work experience requirements
 - performance expectations
- A Practice Standard is not used to determine who can or cannot work within a given Practice Area. It is used to identify whether a member is qualified to work unsupervised (independently) within a Practice Area.
 - It provides guidance and direction to members with respect to enhancing their professional practice by identifying knowledge, experience and performance requirements within the Practice Area and thereby assisting members in targeting their professional development.





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2017

*Contaminated Lands - Assessment, Remediation and Management
Practice Standard*



Approved by AIA Council
5/18/2017

Contaminated Land - Assessment, Remediation and Management Practice Standard



Section 2: Scope of the Practice Area

- Defines the scope of the practice area to include 7 key activities:
 - Understanding Drivers and Planning
 - Phase I Environmental Site Assessments
 - Phase II Environmental Site Assessments
 - Remediation
 - Risk Assessment
 - Exposure Control (Risk Management)
 - Validation and Closure

Section 3: Knowledge Requirements

Example: Phase II ESAs

Core Knowledge Area	Rationale	Required Knowledge	Recommended Knowledge
Contaminants	A knowledge of the fundamentals of both inorganic and organic chemistry is necessary to understand contaminant behavior within environmental media and routes of exposure to receptors. In addition, understanding knowledge of statistically valid sampling designs and analysis of data is required.	<ul style="list-style-type: none"> • Inorganic Chemistry • Organic Chemistry 	<ul style="list-style-type: none"> • Contaminant Behavior • Environmental Sampling Design • Statistical Analysis
Soils and Landforms	An advanced knowledge of soil processes and behavior, and ability to describe soil and geology according to standard classification systems for communicating site characteristics is necessary to understand and interpret contaminant fate and behavior when conducting Phase 2 ESAs.	<ul style="list-style-type: none"> • Soil Science • Soil Classification 	<ul style="list-style-type: none"> • Soil Chemistry • Quaternary Geology • Geomorphology • Geochemistry
Water	Knowledge of surface and subsurface water behavior and the dynamics of hydrologic processes at a given site is necessary to understand how these influence contaminant fate and transport.	<ul style="list-style-type: none"> • Hydrology OR Hydrogeology 	<ul style="list-style-type: none"> • Soil Physics
Vegetation	A knowledge of plant science is necessary for understanding and recognizing indicators of contaminant effects on vegetation.	<ul style="list-style-type: none"> • Plant Science • Vegetation Identification 	<ul style="list-style-type: none"> • Weed Science • Plant Physiology • Plant-Soil Relationships



Example: Remediation

Core Knowledge Area	Rationale	Required Knowledge	Recommended Knowledge
Contaminants	A knowledge of the fundamentals of both inorganic and organic chemistry is necessary to understand contaminant behavior within environmental media and routes of exposure as well as understanding chemical reactions and biological activity potentially involved in remedial technologies and strategies.	<ul style="list-style-type: none"> • Inorganic Chemistry • Organic Chemistry • Remediation Strategies 	<ul style="list-style-type: none"> • Soil Microbiology • Biotreatment • Toxicology
Soils and Landforms	An advanced knowledge of soil processes and behavior in relation to contaminant fate and behavior is necessary to select and implement appropriate remedial technologies and strategies and for understanding how technologies react differently with different site conditions.	<ul style="list-style-type: none"> • Soil Science • Soil Classification • Soil Chemistry 	<ul style="list-style-type: none"> • Geochemistry
Water	A knowledge of surface and subsurface water behavior and the variability of hydrologic processes is necessary to understand and evaluate contaminant fate and transport spatially and temporally.	<ul style="list-style-type: none"> • Hydrology OR Hydrogeology 	<ul style="list-style-type: none"> • Soil Physics

Example: Risk Assessment

Core Knowledge Area	Rationale	Required Knowledge	Recommended Knowledge
Contaminants	A comprehensive knowledge of contaminant properties and behavior, toxicology, and risk assessment protocols are required for understanding and conducting risk assessments for human and ecological health.	<ul style="list-style-type: none"> • Inorganic Chemistry • Organic Chemistry • Contaminant Behavior • Ecological and Human Health Risk Assessment • Toxicology • Statistical Analysis 	
Soils and Landforms	An advanced knowledge of soil chemistry and surficial geology stratigraphy is essential for understanding risk and potential for exposure.	<ul style="list-style-type: none"> • Soil Science OR Quaternary Geology • Soil Chemistry 	
Water	A knowledge of surface and subsurface water behavior and the variability of hydrologic processes at a given site is necessary to understand how these influence contaminant fate and transport.	<ul style="list-style-type: none"> • Hydrology • Hydrogeology 	
Vegetation	A knowledge of plant science is necessary to understand and recognize indicators of contaminant effects on vegetation.	<ul style="list-style-type: none"> • Plant Science • Plant Nutrition • Plant Physiology 	

Risk Assessment (cont'd)

Ecology	<p>A knowledge of how ecosystem components (e.g. soil, water, air, vegetation, wildlife) interact with each other is necessary to understand the potential effect of contaminants on the ecosystem.</p>	<ul style="list-style-type: none"> • Ecology 	<ul style="list-style-type: none"> • Ecosystem Management
Animals	<p>A knowledge of animal nutrition and physiology is necessary to understand the potential effects of contaminants on animal health.</p>	<ul style="list-style-type: none"> • Animal Nutrition • Animal Physiology 	
Socioeconomics and Policy	<p>A knowledge of the regulatory, economic, and environmental drivers for environmental site management is required.</p>	<ul style="list-style-type: none"> • One of the recommended subjects for Socioeconomics and Policy 	<ul style="list-style-type: none"> • Environmental Policy • Environmental Planning • Environmental Impact and Mitigation • Land Use Planning



What if a Member is Lacking Required Knowledge?

The practice standards identify three options:

- Seek Advice and Direction: Members lacking specific knowledge in required subject matters must recognize the limits of their expertise and seek advice and direction from a qualified professional.
- Complete Challenge Exam(s): To validate that subject matter knowledge has been gained through work experience, self-study or non-adjudicated industry courses, a member will be required to either (i) write a professional practice examination supplied by the AIA; or, (ii) to appear before a panel of peers to complete an oral examination supplied by the AIA;
- Pursue Formal Education and Training: Obtain credit in a formal course from an appropriate educational institution or from an industry course approved by the AIA. Such courses must have an adjudicated examination to document knowledge attained.

Section 4: Work Experience

- Section 4 identifies three categories of practitioners based on work experience:
 - Junior Practitioner (generally < 5 years of experience)
 - Intermediate Practitioner (generally 5 to 10 years of experience)
 - Senior Practitioner (generally > 10 years of experience)
- Typical job duties and responsibilities for each of the three categories above are described.
- Skill sets to be developed through work experience are also described in the practice standard.
- Overall, provides clarity around experience requirements to take on particular job responsibilities; also clarifies typical career progression in the practice area.

Main PA Activity	Junior Level	Intermediate Level	Senior Level
Understanding Drivers and Planning		√	√
Phase 1 ESA	*	√	√
Phase 2 ESA	*	√	√
Remediation	*	√	√
Exposure Control (Risk Management)		*	√
Risk Assessment		*	√
Validation and Closure		*	√
√ Experience level sufficient to be responsible for the activity * Under direct supervision only			

Section 5: Performance Requirements

- Section 5 outlines professional performance expectations for the practitioner:
 - Stay current with advances in knowledge, science and technology within the PA;
 - Ongoing professional development;
 - Self-assessment against the practice standard;
 - Develop plan to address any knowledge limitations;
 - Working within one's expertise and experience; seek help from other qualified professionals as required.
 - Etc.



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2017

Land Reclamation Practice Standard



Approved by the AIA Council

5/18/2017

Land Reclamation Practice Standard



Section 2: Scope of the Practice Area

- Section 2 identifies 4 main activities:
 - Understanding Drivers and Planning
 - Project Execution
 - Monitoring
 - Verification

Core Knowledge Areas for Land Reclamation

Core Knowledge Area	Subject Matter Areas	Rationale
Ecology	<ul style="list-style-type: none"> • Introductory Ecology 	Knowledge of interrelationships among ecosystem components is required.
Water	<ul style="list-style-type: none"> • Introductory Hydrology 	Knowledge of the hydrologic cycle and behavior of water in soils and the landscape is required.
Soils	<ul style="list-style-type: none"> • Introductory Soil Science • Soil Genesis and Classification <p>And at least one:</p> <ul style="list-style-type: none"> • Soil Chemistry • Soil Physics • Soil Fertility • Soil Biology • Soil Conservation • Soil Biogeochemistry 	Knowledge of soil formation and classification and advanced understanding of soil processes and properties is required.
Vegetation	<ul style="list-style-type: none"> • Introductory Plant Science <p>And at least one of:</p> <ul style="list-style-type: none"> • Plant Identification and Taxonomy • Community Ecology • Weed Science • Plant Physiology • Plant Pathology • Range Management • Forest Ecology 	Knowledge of plant identification and taxonomy and advanced understanding of vegetation interaction with its environment is required.



How Are Practice Standards Used in Professional Regulatory Management?

- Member Self-Assessment:
 - Members are requested to complete a self-assessment based on the practice standard(s) relevant to their PAs.
 - Online tool is available to assist regulated members with their self-assessment
- Competence Committee:
 - In-training member (articling members AIT and ATT) files are reviewed to determine whether they have the requisite knowledge and experience for unsupervised practice within the PA they request.
 - Full professional designation (PAg and RTAg) may be denied if the competence committee determines the member is working beyond their knowledge and experience levels.
 - Provide feedback to AIT and ATT members to facilitate professional development and education upgrading.
- Practice Reviews:
 - Random check to see if members are qualified and working within their area of expertise and within their experience level.
 - Provide direction and guidance for professional practice improvements.

In Closing

- The AIA is continuing to strive for compliance with the regulatory mandate of the *Agrology Profession Act* and the *Agrology Profession Regulation*.
- The development of practice standards for the Agrology profession is driven by the legal requirements of the *APA* and *APR*, particularly Section 3 of the *APA*.
- Practice standards provide regulated members of the Agrology profession with direction and guidance with respect to professional practice within specific Agrology Practice Areas.
- Practice Standards are available on the AIA Website:
 - <https://www.albertaagrologists.ca/site/practice-areas>