PROFESSIONAL PRACTICE STANDARD

MAY 1, 2017

Professional Responsibilities in Completion and Assurance of Wetland Science, Design and Engineering Work in Alberta

Prepared by the Professional-10:

The Alberta Association of Landscape Architects

ACPA
Association of the Chemical Profession of Alberta

ALBERTA INSTITUTE OF AGROLOGISTS

Alberta Land Surveyors' Association

APEGA
The Association of Professional Engineers and Geoscientists of Alberta

APPI
Alberta Professional Planners Institute

ASET
The Association of Science and Engineering Technology Professionals of Alberta

ASPB
Alberta Society of Professional Biologists

College of Alberta Professional Foresters

College of Alberta
PROFESSIONAL FOREST TECHNOLOGISTS

Alberta Government

FOREWORD

These are *competency*, *education*, and *professional experience* requirements intended to define the responsibilities of *authenticating professional members* for submission of regulatory documents under the Alberta Wetland Policy.

Although this document is not specifically legislated under the respective *Professional Regulatory Organizations'* Acts and Regulations, members who wish to *authenticate* regulatory documents under the Alberta Wetland Policy are expected to conform to it in order to be practicing in accordance with what is deemed to be an acceptable standard.

PARTICIPANTS

A joint committee, the *Competency Advisory Group* (CAG), comprising representatives of 10 *Professional Regulatory Organizations (Professional 10; PRO-10)*, has prepared this document in order to achieve uniformly high standards of professional *practice* that meet the intent of the Alberta Wetland Policy. The goal of the CAG was to define and set a level of assurance in which a competent and effective consulting industry can provide direct benefits to the public. During the time that this document was developed, the CAG had the following membership:

Participant	Representing
Bernard Amell, BLA, AALA	Alberta Association of Landscape Architects
Joey Hurley, P.Ag.	Alberta Environment and Parks
Matthew Wilson	Alberta Environment and Parks
Thorsten Hebben, P.Biol.	Alberta Environment and Parks
Brian Munday Dave Thompson, ALS	Alberta Land Surveyors' Association
Dr. Les Fuller, P.Ag.	Alberta Institute of Agrologists
Dr. Claudia Palylyk, P.Ag., RPP, MCIP	Alberta Professional Planners Institute
Dr. Markus N. Thormann, P.Biol., PWS	Alberta Society of Professional Biologists
Kathy Janzen, P.Chem.	Association of the Chemical Profession of Alberta
Tom Sneddon, P.Geol. Dr. Lian Zhao, P.Eng.	Association of Professional Engineers and Geoscientists of Alberta
Laurie Hamilton, PWS, P.Biol., C.E.T.	Association of Science and Engineering Technology Professionals of Alberta
Noel St. Jean, RPF	College of Alberta Professional Foresters
Mike Poscente, MBA, RPFT	College of Alberta Professional Forest Technologists

To maintain consistency in Government of Alberta documents, the format of this document parallels the document entitled *Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta*: Joint *Practice* Standard Version 1.1 (Professional 7, July 2012). The wording, headings, and structure have been modified somewhat to meet the specific needs of this document. A complete list of references cited in the development of this document is included in Appendix A.

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1.0 OVERVIEW

Recognizing the interdisciplinary nature of wetland science, design, and engineering in Alberta, this *professional practice standard* has been jointly developed by Alberta Environment and Parks (AEP), the Alberta Association of Landscape Architects (AALA), the Alberta Institute of Agrologists (AIA), the Alberta Land Surveyors' Association (ALSA), the Alberta Professional Planners Institute (APPI), the Alberta Society of Professional Biologists (ASPB), the Association of the Chemical Profession of Alberta (ACPA), the Association of Professional Engineers and Geoscientists of Alberta (APEGA), the Association of Science and Engineering Technology Professionals of Alberta (ASET), the College of Alberta Professional Foresters (CAPF) and the College of Alberta Professional Forest Technologists (CAPFT). The *Professional Regulatory Organizations* listed here shall henceforth be referred to as the PRO-10. This document serves as a foundation for *authentication* of regulatory documents as per the requirements of the Alberta Wetland Policy.

The *Competency Advisory Group* (CAG), under the guidance of the PRO-10, initiated work in November 2015. The CAG identified *competencies* required to conduct *tasks* under the Alberta Wetland Policy as well as *education* and *professional experience* requirements for professional *authentication* of regulatory documents.

1.1 Scope

This document is the result of a collaborative effort between the PRO-10, the CAG, and the Government of Alberta. By signing off on this document, the PRO-10 agrees that the guidance contained herein describes who is authorized to *authenticate* wetland related documents under the Alberta Wetland Policy, and to submit regulatory documents to the *regulators*.

Each of the PRO-10 is responsible to ensure its members are aware of, understand, and adhere to this document and the intent of the Alberta Wetland Policy.

It is not in the scope of this document to prescribe how *competencies* will be determined by each individual PRO-10. A professional practitioner must follow the specifications within their profession to demonstrate *competency* in that area.

1.2 Purpose

Alberta Environment and Parks was tasked with developing a new Alberta Wetland Policy and to provide assurance to Albertans that our wetlands are being managed to a high professional standard. It is the purpose of this document to set forth those requirements.

There are two purposes to this document. This report is a set of recommendations to:

- Support the addition of a wetland-focused *practice area* to each PRO-10. The PRO-10 has agreed to implement this *practice standard* for professional practice. However, it is not in the scope of this document to provide specific advice on how recommendations in this report should be implemented within each profession.

- Provide *authenticating* professionals within the PRO-10 a *competency* guideline for wetland science, design, and engineering in Alberta under the Alberta Wetland Policy. *Authenticating* professionals should use this document for self-evaluation, and to assist in the selection of appropriate contributing professionals so as to meet all of the requirements under the Alberta Wetland Policy.

1.3 Definitions

A list of definitions applicable to this report is in Appendix B. Defined words are italicized throughout this report.

1.4 Adaptive Management

AEP, in collaboration with the PRO-10, will review the recommendations put forth in this report in 2021 with a subsequent update to this report. This review will be part of adaptive management, which allows for increased confidence in recommendations and promotes due diligence by wetland science, design, and engineering practitioners in ensuring public safety, as well as accountability of the Government of Alberta. Regular reviews will continue to be scheduled.

1.5 Summary of Results

The CAG produced a *Competencies Table* (Appendix C) describing the tasks that must be completed as part of the requirements under the Alberta Wetland Policy. Each *task* is associated with a list of competencies that a professional must possess to ensure competent completion of each *task*. The competencies are grouped in broader knowledge areas.

Outside of *competency* areas, a list of general *skills* and *professional experience* requirements are included in this document.

It is unlikely that one individual will be *competent* in all areas of wetland science, design, and engineering. It is expected that this document, specifically the *Competencies Table*, will guide authenticating *professional members* toward the selection of team members who will fulfill the needs of their projects.

2.0 BACKGROUND

2.1 *Professional Regulatory Organizations* in Alberta

In Alberta, *Professional Regulatory Organizations* are self-regulating organizations that are guided by provincial legislation and regulations. These organizations have been given the statutory authority in Alberta to regulate their respective professions or professionals in

a manner to ensure public safety and interests are protected. The professions themselves are charged with the legal responsibility of ensuring that their *professional members* are qualified to *practice* in the fields or areas of interest within which they are offering services to the public. Refer to the *Professional Regulatory Organizations'* defined scopes of practice, standards, and ethics, as required.

Each *Professional Regulatory Organizatio*n is enacted under provincial legislation and, where applicable, maintain scope of *practice* and professional *practice* standards for specific disciplines. Consequently, this enables them to undertake professional *practice* discipline and the ability to mandate their membership to abide by their respective standards.

Functionally, the organizations are responsible for licencing, accrediting, or designating qualified individuals who wish to *practice* in a specific field in Alberta. Applicants who meet the relevant standards for ethical, professional, and technical *competency* are held responsible to a high professional standard and, therefore, provide assurance to Albertans and the Government of Alberta that the public interest is being protected. Every *Professional Regulatory Organization* in Alberta functions according to the specific needs of the organization.

2.2 Wetland Practitioners

Wetland science, design, and engineering are interdisciplinary in nature but are necessarily brought together by the requirements of the Alberta Wetland Policy. Broad descriptions of each individual component of this *Practice Area* are provided here.

2.2.1 Wetland Science

Wetland science deals with the physical, chemical, and biological properties of wetland ecosystems. In the context of the Alberta Wetland Policy, the professional seeks to understand the functionality of wetlands and how human and natural activities influence a wetland's ecological condition.

2.2.2 Wetland Design

Wetland design is the *practice* of creating wetland systems that are as to near self-sustaining as possible, within the constraints and opportunities of its catchment and surrounding human and natural environments. The final design must combine considerations from a broad array of scientific and technical disciplines to devise a wetland system that meets desired outcomes. It is the fusion of creative and technical disciplines that distinguishes wetland engineering and design from wetland science.

2.2.3 Wetland Engineering

The practice of engineering means reporting on, advising on, evaluating, designing, and preparing plans and specifications for or directing the construction, technical inspection, maintenance, or operation of engineered structures, works, or processes. For the purposes of this document, engineering refers to wetland engineering.

3.0 PROFESSIONAL EVALUATION

Professional members shall recognize that environmental issues are interdisciplinary in nature, and only undertake work that they are *competent* to perform by virtue of their *training, education*, and *professional experience*. *Professional members* shall 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, professional experience,* and *training* as required by their respective PRO-10 and by the provincial *regulators* to provide technically sound wetland science, design, and/or engineering advice and work. Professionals practicing in wetland science, design, and/or engineering must ensure that their *skills* are regularly improved and enhanced through *training* and knowledge sharing.

Professional *practice* demands integrity, competency, and objectivity, while fulfilling responsibilities to the public, the employer or client, the profession, and other *professional members*. *Professional members* providing wetland services are advised to refer to their own professions' *codes 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.

3.1 Professional Self-Declaration of Required Competencies

Alberta Environment and Parks organized and chaired the CAG and PRO-10 in 2015-2016 to identify the general competencies required to conduct wetland science, design, and engineering work.

The *Competencies Table* (Appendix C) recognizes that wetland science, design, and engineering work are often multi-disciplinary in nature. Further, it recognizes that any one individual will likely not have the entire *skill* set necessary to address and complete all of the possible *tasks* involved in a particular assignment. This table guides *professional members* in the assessment of their own *expertise* and toward the selection of team members who will fulfill the needs of the project.

3.2 Professional Discipline

Should *professional members* exhibit professional misconduct (as defined by their respective PRO-10 and their associated professional *practice standards* and/or *codes of ethics*) in any manner, such as practicing beyond the scope of their *expertise*, they are subject to disciplinary action by their respective *Professional Regulatory Organization* as set out in their enabling/enacted provincial legislation and regulations.

4.0 REQUIREMENTS FOR AUTHENTICATION IN SUPPORT OF *WATER ACT* APPROVALS UNDER THE ALBERTA WETLAND POLICY

Wetland practitioners must meet the requirements as set out below in order to *authenticate* professional documents for submission under the Alberta Wetland Policy. The meaning of *authentication* is described in detail in Section 5.0 of this document.

Professionals who do not meet the requirements set forth in this section may contribute and complete wetland science, design, and/or engineering work under the direct supervision of a qualified professional; however, they will not be able to *authenticate* regulatory documents under the Alberta Wetland Policy.

4.1 Education Requirements

4.1.1 Registration Requirements for Membership with PRO-10

Educational requirements for registration with a *Professional Regulatory Organization* are determined individually by each organization. Professionals wishing to *authenticate* regulatory documents as a wetland practitioner must possess one of the professional or technical designations listed below from one of the PRO-10, thereby meeting all *education*, experience, continuing professional development, and any other requirements to remain in good standing as a regulated member in their respective *Professional Regulatory Organization*.

The following designations meet the registration requirements of section 4.1.1 of this document:

I. A professional engineer, professional geoscientist, professional licensee (engineering), professional licensee (geoscience), or licensee entitled to engage in the practice of engineering or geoscience under the *Engineering and Geoscience Professions Act*, R.S.A. 2012, c. E-11.1.;

II. A professional agrologist or registered technologist (agrology) under the *Agrology Professions Act,* R.S.A. 2005, c. A-13.5;

III. A professional biologist under the Professional Biologists Regulation (AR 120/2002) *Professional and Occupational Associations Registrations Act*, R.S.A. 2000, c. P-26;

IV. A professional chemist under the Professional Chemists Regulation (AR 248/2001) *Professional and Occupational Associations Registrations Act*, R.S.A. 2000, c. P-26;

V. A registered professional forester under the *Regulated Forestry Profession Act*, R.S.A. 2000 c. R.-13;

VI. A registered professional forest technologist under the *Regulated Forestry Profession Act*, R.S.A. 2000 c. R.-13;

VII. A professional landscape architect under the Landscape Architects Regulation (AR 228/2010) *Professional and Occupational Associations Registration Act*, R.S.A. 2000 c. P-26;

VIII. A professional planner under the Professional Planner Regulation (AR 115/2010) *Professional and Occupational Associations Registration Act*, R.S.A. 2000, c. P-26;

IX. A professional land surveyor under the *Land Surveyors Act*, c. L-3:

X. A professional technologist registered with ASET under the *Engineering and Geoscience Professions Act*, R.S.A. 2012, c. E-11.1

who is also

XI. A member in good standing of a relevant Professional Regulatory Organization;

XII. A practicing member in compliance with the Professional Regulatory Organization's continuing professional development program

4.1.2 Education Requirements for Competency in a Specific Subject Area

In addition to meeting the education requirement for PRO-10 registration, the *authenticating* professional must demonstrate competency through evidence of formal training and/or education in the specific competencies contained in Appendix C: *Competencies Table.*

4.2 Competency Requirements

The *Competencies Table* (Appendix C) recognizes that wetland science, design, and engineering work are often multi-disciplinary in nature. This table is intended to guide *professional members* in the assessment of their own *expertise* and toward the selection of team members who will fulfill the needs of the project.

The depth of understanding required within each *competency* area will be determined by individual project requirements and complexity. It is the responsibility of the professional practitioner to recognize varying degrees of complexity and regulatory requirements of a project when assembling the appropriate project team with the necessary *expertise* to complete the identified *tasks.*

4.3 Recommended Tools and Skill Sets

Skill sets, such as sampling methodology and field techniques, are not specific to wetland science but are necessary *skills* to complete many of the Wetland Policy *tasks* listed. A listing of recommended *tools* and *skill* sets that should be part a practitioner's *skill* set are listed in Appendix D. This table should not be considered an exhaustive list.

Practitioners are responsible to follow correct sampling, methodology, analytics, and/or interpretation processes. It is the responsibility of the *authenticating* wetland practitioners to seek appropriate professional contributions, especially for non-routine assessments.

In addition, a practitioner should have a robust understanding of the regulatory environment in Alberta and Canada. A list of applicable acts, regulations, and policies are included in Appendix E of this report. This list should not be considered exhaustive.

4.3.1 Alberta Wetland Rapid Evaluation Tool – Actual

ABWRET-A is a tool that combines spatial and field data and was designed specifically for use under the Alberta Wetland Policy. *ABWRET* implementation includes:

- Identifying wetland management values and selecting indicators
- Modelling indicators using regional spatial datasets
- Collecting field data (measurements of characteristics of indicators)
- Calculating the value category of a wetland
- Determining mitigation strategies based on *ABWRET-A* wetland value category under the Alberta Wetland Mitigation and Wetland Assessment and Impact Report Directives

ABWRET-A is a necessary part of the application process when there is permanent loss of wetland area and function. A practitioner *authenticating* a Wetland Assessment and Impact Report (WAIR) should have a strong understanding of the *ABWRET* and its use.

4.4 Professional Experience

Professional experience is work conducted by a registered professional practitioner during which the individual is subject to the act, regulations, bylaws, practice standards and code of ethics of his/her professional regulatory body.

This includes experience gained within Alberta with one of the PRO-10, or experience gained as a professional in another province as required by their professional regulatory organization, in order to meet the mutual recognition obligations contained in the labour mobility provisions of the national Agreement on Internal Trade and, as applicable, the New West Partnership Trade Agreement.

To *authenticate* wetland documents as part of a submission under the Alberta Wetland Policy, the professional must demonstrate a total of five years of *professional experience*, with a minimum of three years of professional wetland experience. It is possible to complete the three years of wetland experience as part of the total of five years of *professional experienc*e. The *professional experience* should be completed under the supervision of a wetland practitioner.

Professional experience is defined as employment experience gained as an individual licenced or registered with a PRO-10 as outlined in Appendix B (definitions) of this report (definition of a *professional*; definition of *professional experience*).

4.4.1 Labour Mobility

The mutual recognition obligations contained in the labour mobility provisions of the national Agreement of Internal Trade (AIT) and the New West Partnership Trade Agreement (NWPTA) between Alberta, British Columbia and Saskatchewan, are upheld in this Practice Standard. These obligations ensure that professional experience gained in other provinces by members of counterpart PROs will be mutually recognized between the Alberta PRO and that of the professional's home jurisdiction, and be counted towards their meeting the Practice Standard's professional experience requirement.

Such mutual recognition does NOT apply to individuals from other Canadian jurisdictions whose services are either (a), unregulated or (b), governed by a *Societies Act* or similar legislation in that jurisdiction. To be eligible to meet the Practice Standard, these individuals must initially become regulated members of the signatory Alberta PRO in order to ultimately meet that organization's professional practice requirements.

In addition, mutual recognition does not apply to persons from other countries who wish to undertake PRO-10 work in Alberta. These individuals must also initially become regulated members of the signatory Alberta PRO in order to ultimately meet that organization's professional practice requirements.

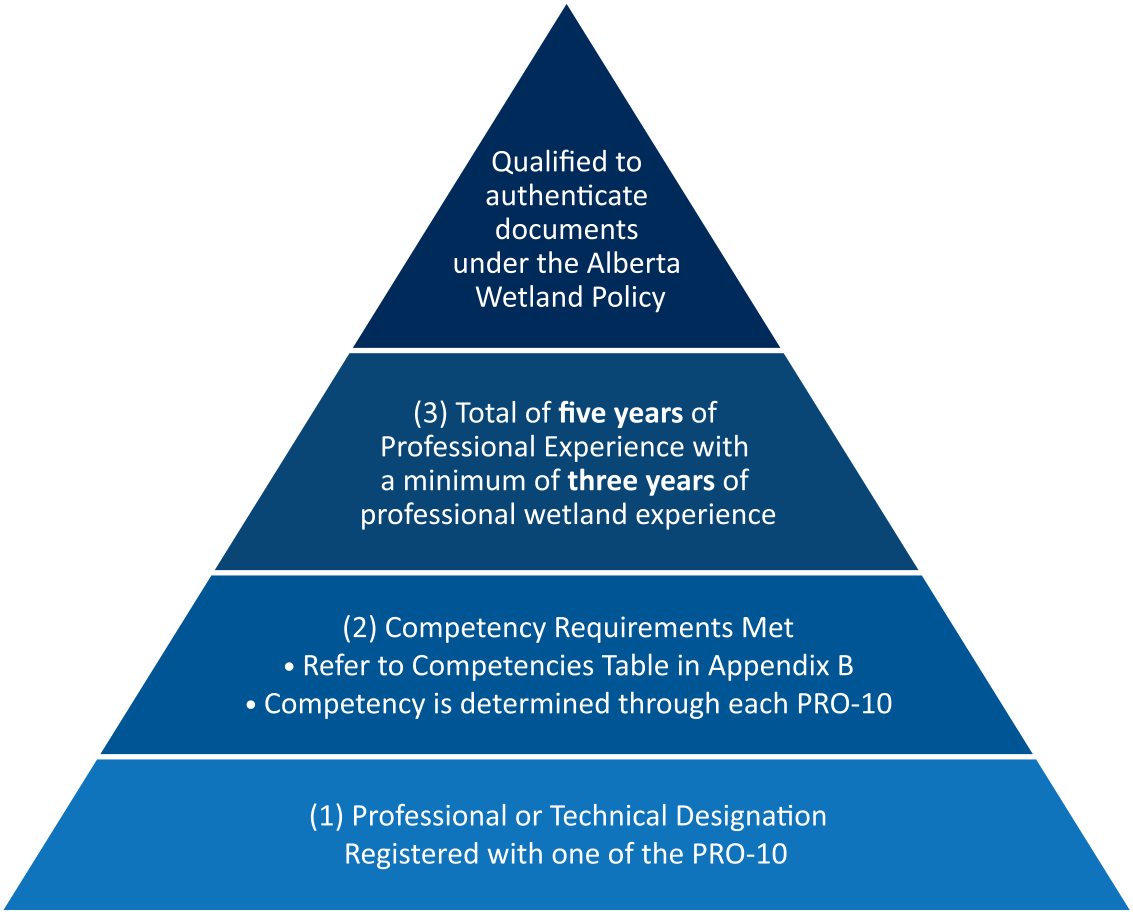
4.5 Summary of Education, Competency, Skills and Experience Requirements for Authentication of Regulatory Documents under the Alberta Wetland Policy

Figure 1 is a representation of the necessary requirements a professional must meet to be qualified to *authenticate* regulatory documents under the Alberta Wetland Policy.

Professionals should begin their self-evaluation at the base of the pyramid diagram (Step 1: Professional or Technical Designation Registered with one of the PRO-10). When and if the Step 1 qualification is met, the professionals must ensure they meet the requirements set forth in Step 2: Competencies Requirements Met. Professionals should refer to Appendix C to assess *competencies* required for various tasks under the Alberta Wetland Policy. If and when Step 2 is met, professionals can move up the pyramid to Step 3 and ensure they have met the *professional experience* requirements, as set forth in Section 4 of this report.

Fulfillment of these requirements qualifies the *professional member* to *authenticate* regulatory documents under the Alberta Wetland Policy. *Authentication* points are set forth in Section 6 of this report.

Figure 1. Diagram of Education, Competency, Skills, and Experience Requirements for Authentication of Regulatory Documents under the Alberta Wetland Policy



5.0 PROFESSIONAL AUTHENTICATION

It is important for each *authenticating professional member* to recognize that the application of his or her signature and/or seal conveys a message of reliability to the *regulators* and to the public. In the *authentication* of professional documents, *professional members* are advising that:

- They prepared or accepted professional responsibility for that work based on preparing the documentation themselves, or directly supervised the work, or reliance on a supporting professional
- They meet the *education, competency,* and *professional experience* requirements, as set forth in this document

- They have a working knowledge of legislation, regulation, and guidelines relative to the Alberta Wetland Policy
- They are functioning under the standards, guidelines, ethics, and terms of their professional organization
- They carry professional errors and omissions insurance either individually or through a corporate plan, as may be required by clients and *regulators*, including, but not limited to, the standard terms of their profession
- The *regulators*, other *professional members*, and the public may rely upon their work

5.1 Principles of Authentication

Authentication means the application of the *professional members'* stamp or seal or membership/registration number, signature, and date to a plan, report, map, or any other forms or documents indicating that the *professional member* has completed or supervised completion of the wetland science, design, or engineering plan or task to an acceptable standard as per the *regulators*' requirements and that the *regulators* may rely on the *professional member* for competent completion of *task*(s) under the Alberta Wetland Policy.

6.0 AUTHENTICATION POINTS FOR SUBMISSIONS UNDER THE ALBERTA WETLAND POLICY

The following four submissions under the Alberta *Water Act* will require *authentication*. Non-authenticating professionals can contribute to these submissions; however, by *authenticating* a document, the professional is advising that all of the points listed in Section 5 of this document are true and the work carried out under the *authenticating* professional has been done in a *competent* manner consistent with this standard.

Authentication of regulatory documents submitted as part of a *Water Act* application package with Alberta Wetland Policy requirement is required for the following submissions:

6.1 Wetland Assessment and Impact Report (WAIR)

Wetland practitioners must authenticate the WAIR as part of the regulatory submission to AEP under the Alberta *Water Act*. The following core components comprise the WAIR:

a. Wetland identification and delineation – all wetlands are identified, delineated, and submitted to the regulatory body in accordance with the Alberta Wetland Identification and Delineation Directive.

b. Wetland classification – the class, form, and/or type of all wetlands are determined and documented in accordance with the Alberta Wetland Classification System (AWCS).

c. Relative wetland value – the *Alberta Wetland Rapid Evaluation Tool – Actual* (*ABWRET-A*) is used to determine the relative value of each wetland.

d. Species surveys – species surveys are conducted in accordance with Species Inventory Protocols, if available, or other legislations. These surveys may require a specialist in botany or wildlife biology.
e. Other surveys – other surveys may be requested by the regulatory body, as needed. These surveys may require a specialist in *hydrology, hydrogeology,* limnology, *soil sciences*, or any other scientific field.

Please see the Alberta Government document *Wetland Assessment and Impact Report Directive* for more information.

6.2 Design and Specification Plan for a Wetland Replacement Project

If avoidance of wetland disturbance is not possible, proponents are required to minimize impacts on wetlands. Where avoidance and minimization efforts are not feasible, wetland replacement is required. Proponents can undertake their own replacement project.

Authentication will be required from a wetland practitioner for a Design and Specification Plan for a wetland replacement project. This is a technical document outlining the restoration of a wetland that had previously been drained, enhancement of an existing degraded wetland, or construction of a wetland where one previously did not exist.

The purpose of a Design and Specification Plan is to define design objectives and priorities, and to create designs that are feasible and serve the identified ecological, engineering, human, operational, and budgetary functions. In addition, a Design and Specification Plan must be in adherence to design and validation protocols, and the proposal must be submitted to AEP, for review, prior to undertaking the project. These protocols will be outlined in the Alberta Government document *Wetlands Offset Restoration Design Protocol.* The Design and Specification Plan should include a monitoring plan commensurate with the complexity of the project and based on the best available science.

6.3 Validation of Wetland Replacement Project

Validation requires a conclusion about the success of the construction of the wetland replacement project based on the Design and Specification Plan. The validation occurs after construction is completed. The authenticating professional for the validation of a wetland replacement project may be either the same professional that prepared the WAIR submittal or the Wetland Restoration Design Plan submittal (or both).

6.4 Verification of Wetland Replacement Project

Verification occurs five years after construction of the wetland replacement project is complete. Depending on the complexity of the wetland project, the wetland practitioner may wish to have more frequent verification points as discussed with and agreed upon by AEP.

Verification is an assessment of the overall functionality of the wetland and therefore will include contributions from professionals in many *competency* areas. It is expected that the *authenticating* professional will practice due diligence in project verification. Once the five-year verification is *authenticated* by the Wetland Practitioner, the wetland replacement project is considered complete.

Figure 2 provides a representation of the *authentication* points under the Alberta Wetland Policy.

Figure 2. Authentication Points Submissions under the Alberta Wetland Policy

7.0 RESPONSIBILITIES OF INVOLVED PARTIES

7.1 Responsibilities of the Regulators

It is the responsibility of AEP to:

- Provide assurance to the public that this system of professional governance is operating to this acceptable standard
- Provide assurance to the public that this system is designed to meet the outcomes of the Alberta Wetland Policy
- Ensure that the appropriate policies and guidelines are in place to guide *professional members* in their work
- Respond to questions submitted in writing by the *professional member* concerning interpretation of acts, regulation, policy, procedure, and guidance that may arise during the work
- Ensure that a wetland practitioner has *authenticated* the work by not accepting non-authenticated applications or submission
- Ensure an appropriate review or audit of applications and submissions

- Develop and provide a system to provide feedback to the PROs on potential emerging issues resulting from the implementation of this Practice Standard
- Provide a rationale for administrative or scientific reason for an application or submission refusal

7.2 Responsibilities of the Professional Regulatory Organizations

It is the responsibility of the *Professional Regulatory Organizations* to:

- Regulate the *practice* of *professional members* carrying out the wetland science, design, and engineering work
- Endorse the joint *competency* requirements for wetland practitioners and ensure *professional members* are aware and comply with this standard
- Define and require compliance with the ethics of the profession
- Review the practices and maintain annual continuing professional development records for practicing *professional members* as enabled through the relevant professional act(s) and/or regulations
- Investigate complaints and discipline *professional members* if standards or ethics have been breached as enabled through the relevant professional act(s) and/or regulations

7.3 Responsibilities of Professional Members

It is the responsibility of the *professional members* to:

- Provide assurance to the public, safeguard the environment and public, and *practice* with due diligence
- Conduct his or her work to an appropriate standard of care
- Maintain a current knowledge of all acts, policies, procedures, and guidance documents of the *regulators* and other agencies
- Document the work thoroughly
- Ensure that data have been collected in a manner consistent with professional practice and that no systematic or intentional bias exists in the data
- Remain aware of any poor or prohibited *practice* and bring this to the attention of the appropriate *Professional Regulatory Organization(s)* and/or the *regulators*
- Only take responsibility for work and conduct work within his or her area of *expertise*

7.4 Responsibilities of Authenticating Members

In addition to all of the responsibilities listed in Section 7.3 of this report, *authenticating* members are also responsible to:

- Determine the scope and complexity of the project and assemble an appropriate professional team
- Delegate portions of the work to other professionals when required; accept responsibility for that work when *authenticating* the regulatory document(s) for submission under the Alberta Wetland Policy
- Apply professional and responsible judgement in interpreting and accepting the work of contributing professionals
- Carry professional errors and omissions insurance either individually or through a group plan, as may be required by clients and *regulators*, including, but not limited to, the standard terms of their profession
- Assume liability for the regulatory submission in its entirety

APPENDIX A: REFERENCES

- Alberta Wetland and Impact Report Assessment (Alberta Environment and Parks, June 2015)
- Alberta Wetland Mitigation Directive (Alberta Environment and Parks, June 2015)
- Alberta Wetland Offset Program Description (Alberta Environment and Parks, September 2015)
- Alberta Wetland Policy (Alberta Environment and Parks, September 2013)
- *Alberta Wetland Rapid Evaluation Tool – Actual* (*ABWRET-A*) Guide (Alberta Environment and Parks, June 2015)
- Alberta Wetland Regulatory Requirements Guide (Alberta Environment and Parks, June 2015)
- *Engineering and Geoscience Professions Act* (Revised Statutes of Alberta 2000 Chapter E-11 Current as of April 30, 2015
- Professional Responsibilities in Completion and Assurance of Reclamation and Remediation Work in Alberta: Joint Practice Standard Version 1.0 (Professional 7, September 2007)

APPENDIX B: DEFINITIONS

Alberta Wetland Rapid Evaluation Tool (ABWRET)	ABWRET (A; Actual) is a standardized method for rapidly assessing some of the important natural functions of all types of wetlands present. ABWRET (E; Estimate) is a GIS based tool designed to predict relative wetland value distribution at the Section level.
Aerial Photo Interpretation	The process of identifying landscape and anthropogenic features through consideration of their shapes, surface textures, shadow patterns, location, size, tone/color, patterns, height/depth and site/situation/associations, with consideration for the scale and date of the photograph.
Authentication	Authentication means the application of the professional members' stamp or seal or membership/registration number, signature, and date to a plan, report, map or any other form or documents indicating that the professional member has completed or supervised completion of the wetland science, design, or engineering plan or task to an acceptable standard as per the regulators' requirements and that the regulators may rely on the professional member for competent completion of task(s) under the Alberta Wetland Policy.
Code of Ethics	Outlines the missions and values of provincially regulated professional organizations, how professionals are supposed to approach problems, the ethical principles based on the organizations' core values, and the standards and acceptable conduct to which the professionals will be held. Provides the foundation of the practice and the organizations' rules of conduct such that public safety is held paramount.

Competency	Competency within a professional practice area arises from a combination of one's education and work experience resulting in acceptable performance. It is expressed in the practitioner's knowledge, skills and judgement used in conducting his or her practice within a given practice area.
Competencies Advisory Group (CAG)	A group of technical representatives from the 10 environmental-related Alberta professional organizations that were tasked with developing new competency, education, and experience requirements for professional authentication of regulatory documents under the Alberta Wetland Policy.
Competencies Table	A table designed to show competencies required to complete each task under the Alberta Wetland Policy.
Competent Practitioner	An individual who has acquired a specific combination of education and work experience relating to specific activities that result in the individual having the ability to undertake, at an appropriate level, one of more components of Wetland Practitioners work.
Directive	Guidance documents supporting the implementation of the Alberta Wetland Policy.
Education	Number of years of education and specified number and types of courses in a particular field assessed against the respective Professional Regulatory Organization's education standards.
Erosion Resistance and Shoreline Stabilization	Conditions of soil and vegetation that result in resistance (or susceptibility) to predicted flow rates, wave action, and wildlife, vehicular, or pedestrian impacts.
Expertise	A combination of skill, knowledge, and experience.

Fisheries Habitat and Biodiversity	A habitat is an ecological or environmental area that is inhabited by a particular species or different species, whereby biodiversity is a means to quantitatively determine the degree of variability within and among different ecosystems.
Global Positioning Systems (GPS)	GPS is a space-based navigation system that utilizes an array of satellites to provide spatial and temporal information for any point on the Earth (where there is a line of sight without obstructions to four satellites) at any given time.
Geographic Information System (GIS)	GIS is a broad term for a suite of geospatial technologies, processes, and methods, often collectively accessed through a single software or suite of software. GIS is a system that incorporates geospatial analysis, geospatial data management, and cartographic capabilities. Competency in GIS, as applied to wetland policy tasks, includes an understanding of geographic information science, which is the science underlying the geographic concepts, applications, and systems applied when representing real-world features in a geospatial environment, such as spatial autocorrelation, topology, 2D-3D distortion, and geospatial processes.
Geology	The branch of science concerned with the formation of the Earth, its constituent parts, its evolution, the materials that form it, and the processes that transform those materials, including the passage of fluids onto and through Earth materials.
Geomorphology	The branch of geoscience that deals with the transformation of the earth's surface through the forces of tectonics, wind, water, temperature, and biological activity.

Geotechnical Design	Design of subgrades and soil structures that support desired ecological and engineering performance objectives. Also, design of finish grades above and below design normal water levels to result in permanent and transient stored volumes and hydroperiods that serve engineering and ecological performance objectives.
Human Use Elements, Barriers, and Safety Features	Design of pathways, boardwalks, accessible shorelines, fencing, barriers, and signage that support safe human use of wetland environments, while managing and limiting impacts to ecological functions.
Hydraulic Analysis and Design	The analysis and design of wetland site drainage, water flow hydrodynamics and proposed structures, which comprise the hydraulics of a wetland.
Hydrography	The stage, or water level, at the wetland as a function of time.
Hydrologic Modelling	A general term applied to multiple types and complexities of predictive models that model the properties, distribution, and effects of water on the Earth's surface, in the soil and underlying rocks, or in the atmosphere. The models generally are simplified conceptual representations of a part of the hydraulic cycle. Two major categories of models are: • Stochastic models, based on data and using mathematical and statistical concepts to link a certain input (e.g., precipitation) to the model output (e.g., runoff). • Process-based models, which attempt to represent the physical processes observed in the real world (e.g., surface run-off, subsurface flow, channel flow etc.).

Hydrology	Water circulation of wetland receiving water including groundwater and surface water or natural springs. Surface water may be accumulated from precipitation, runoff, streamflow, incoming tides, spillover from the adjacent water body. Water entering to the wetland is exchanged dynamically between surface wetland water, the groundwater and the receiving waters. Hydrology convey a combinations of water drainage channel, seepage, natural groundwater gradient and hydraulic, evapotranspiration, outgoing tides, and water control structures.
Hydrogeology	Wetland hydrogeology deals with the area of geology that deals with the distribution and movement of groundwater in aquifers contributing to the wetland receiving water.
Impact Identification, Assessment, and Mitigation	Impact identification and assessment involve understanding baseline environmental and land use conditions, the scope of activities associated with any project that disturbs a wetland, or any of the processes associated with that wetland's performance, and determining the short- and long-term direct and indirect negative effects of that disturbance on that wetland. Mitigation involves recommendations and best management practices that negate or minimize impacts to a wetland, or seeks to achieve replacement if impacts are unavoidable.
Knowledge Area	A knowledge area is based on an overarching process or theory, and consists of several competencies required to complete a wetland policy implementation task.
Land Use	Land use is characterised by the arrangements, activities and inputs people undertake in a certain land-cover type to produce, change, or maintain it.
Materials Selection and Testing	Analysis, specification, and testing of artificial and organic materials that may be utilized in restoration or creation of wetlands. Examples are amended soils, clay or artificial liners, erosion matting, and nursery-grown native plants.

Practice	The scope of expertise within a knowledge area claimed by a professional in that field.
Practice Area	An area of expertise that requires specialized knowledge, skills, and experience.
Practice Standard	A practice standard defines the expectations of the profession with respect to professional practice within a given practice area and outlines the requirements for competent practice. Clear documentation of competency requirements within a practice standard provides the public the necessary assurance that professional members are aware of the requirements for competent practice and professional members have a benchmark upon which to assess their professional practice and identify potential learning needs in their continuing competence program.
Professional 10 (PRO-10)	The 10 professional regulatory bodies responsible for developing the competency, education, and experience requirements for the practice area of Wetland science, design, and engineering in Alberta. The 10 bodies include the Alberta Association of Landscape Architects (AALA), Alberta Institute of Agrologists (AIA), Alberta Land Surveyors' Association (ALSA), Alberta Society of Professional Biologists (ASPB), Alberta Professional Planners Institute (APPI), Association of the Chemical Profession of Alberta (APCA), Association of Professional Engineers and Geoscientists of Alberta (APEGA), Association of Science and Engineering Technology Professionals of Alberta (ASET), College of Alberta Professional Foresters (CAPF), and College of Alberta Professional Forest Technologists (CAPFT).

Professional Experience	Work conducted by a registered professional practitioner during which the individual is subject to the act, regulations, bylaws, practice standards and code of ethics of his/her professional regulatory body. This includes experience gained within Alberta with one of the PRO-10, or experience gained as a professional in another province as required by their professional regulatory organization, in order to meet the mutual recognition obligations contained in the labour mobility provisions of the national Agreement on Internal Trade and, as applicable, the New West Partnership Trade Agreement.
Professional Member	A person registered and in good standing with his/her professional regulatory association, college or institute and who abides by a code of professional ethics, who practices only within the area of his/her individual expertise and competency, who is subject to a practice standard, and can be subject to potential disciplinary action in response to incompetent practice.
Professional Regulatory Organization	The associations, colleges, or institutes that have been given the statutory authority in Alberta to regulate their respective professions.
Regulators	The authorities having jurisdiction over *Water Act* applications and associated requirements under the Alberta Wetland Policy: Alberta Environment and Parks (AEP) and the Alberta Energy Regulator (AER).
Restoration Ecology	The intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability. The practice of restoration ecology includes a broad scope, including erosion control, reforestation, use of genetically local native species, removal of non-native species and weeds, revegetation of disturbed areas, daylighting streams, reintroduction of native species, as well as habitat and range improvement for targeted vegetation and wildlife species.

Sediment Characteristics	Sediment is the accumulation of sand, dirt, and fine particles of clay and silt that settles in the bottom of wetlands. The high surface area of the fine grains sequester pollutants, so that suspended sediments and the top few centimeters of bottom sediment have far greater concentrations of trace metals and other contaminants than the water column. Dissolved oxygen is usually rapidly depleted below the sediment-water interface. The resulting anoxic conditions can drive the development of steep chemical gradients for pollutant and nutrient species. Contaminants can be re-suspended in the water column and reintroduced into the aquatic food chain through diffusion, irrigation, and disturbances due to water currents, storms, or activities of animals.
Skill	Proficiency that is acquired or developed through training or experience.
Soil Genesis	The development of soil from underlying parent materials in response to hydrological, chemical, physical, and biological processes acting in response to environmental site conditions. These processes acting on parent material over time result in the observed morphology, properties, and behaviour of soils.
Soil Identification and Classification	Identification of soil properties, diagnostic features, and soil horizons, arising from processes of soil formation, resulting in determination of the correct taxonomic unit according to the Canadian System of Soil Classification.
Soil Physical and Chemical Properties	The properties and behaviour of soils directly affecting water, heat, and gaseous retention and movement through the soil profile, nutrient availability and retention, acidity, and salinity. These properties directly influence the condition of the rooting zone of vegetation.
Stability Monitoring	Predictive monitoring of conditions of soil and vegetation that may result in susceptibility to destabilization due to erosive forces, wetting/drying, vegetation loss and wildlife, vehicular or pedestrian impacts.

Surficial Geology	The appearance of mapable geological formations outcropping at the surface of the Earth.
Task	One of the steps necessary to complete a submission under the Alberta Wetland Policy.
Technology	Refers to the study of the application of scientific knowledge for practical purposes.
Terrain Analysis	Identification of surficial geological materials, slope morphology, and slope gradient and the effects of surface and subsurface hydrology on material stability and erosion.
Tool	Some type of written or digital guidance enabling a professional to perform a task.
Training	Under the guidance of a subject matter expert, an individual develops skills and/or knowledge that relate to a specific competency or competencies.
Vegetation Establishment Procedures	Vegetation specifications, including plant material qualitative standards, seed mixes, planting procedures, and monitoring and maintenance activities as required to ensure establishment success. Where applicable ecological "success" will include design for biodiversity, not merely continuous plant cover.
Water Chemistry	Basic water chemistry usually refers to elementary analyses of pH, salinity, nutrient levels (nitrogen and phosphorus), dissolved oxygen, and turbidity. More advanced water chemistry involves a wide variety of optional analyses for components, such as major anions and cations, dissolved gases, radioactive substances, and trace materials. Trace materials that can be analyzed include pollutants, such as heavy metals, pesticides, volatile organic hydrocarbons, polycyclic aromatic hydrocarbons, naphthenic acids, cyanotoxins, endocrine disruptors, and pharmaceutical residues.

Water Regime	The water regime of a wetland water body is its characteristic behaviour in terms of hydrology, including its hydroperiod and its flow, salinity, and temperature profiles. The water regime of a wetland water body can also mean its characteristic behaviour in terms of chemistry and biology; i.e., its water chemistry (see definition above) and the state of the ecological community interacting with the wetland.
Water Quality Performance Prediction	Computer modelling and/or calculations based on technical reference data, used to estimate water quality performance of designed or restored wetland systems. Accurate predictions often require site-specific or locally generated empirical data to calibrate the modelling procedures and calculation algorithms.
Wetland Morphology including Substrates and Liners	Design of subgrades and surficial soil structures that support desired ecological and engineering performance objectives.
Wetland Vegetation Ecology	The relationship and interactions among vegetation species and their environment, including other organisms, in wetlands.
Wetland Vegetation Identification and Taxonomy	The identification of wetland vegetation species based on morphological characteristics, e.g., leaves, flowers, and growth habit, and their subsequent classification to genus and/or species toward understanding the wetland vegetation community composition.
Wildlife and Fish Indicators	Any wildlife or fish species that defines a trait or characteristic of the environment, including pollution, management, and/or sensitivity indicator species.
Wildlife Habitat and Biodiversity	A habitat is an ecological or environmental area that is inhabited by a particular species or different species, whereby biodiversity is a means to quantitatively determine the degree of variability within and among different ecosystems, which involves assessing the number of different species most often.

APPENDIX C: COMPETENCIES TABLES

	ALBERTA WETLAND POLICY TASKS					
	Identification and Delineation	**Classification**	**Permanence**	**Wetland Assessment and Impact Report**	**Wetland Design, Restoration and Enhancement**	**Monitoring**
Knowledge Areas						
Vegetation	Wetland Vegetation Ecology	Wetland Vegetation Ecology		Wetland Vegetation Ecology	Wetland Vegetation Ecology	Wetland Vegetation Ecology
	Wetland Vegetation Identification and Taxonomy	Wetland Vegetation Identification and Taxonomy		Wetland Vegetation Identification and Taxonomy		Wetland Vegetation Identification and Taxonomy
				Impact Identification, Assessment and Mitigation		
					Restoration Ecology	Restoration Ecology
Soils	Soil Identification and Classification	Soil Identification and Classification		Soil Identification and Classification	Soil Identification and Classification	Soil Identification and Classification
	Soil Genesis	Soil Genesis		Soil Genesis	Soil Genesis	
				Impact Identification, Assessment and Mitigation		
				Soil Physical and Chemical properties	Soil Physical and Chemical properties	Soil Physical and Chemical properties
					Sediment Characteristics	Sediment Characteristics
					Restoration Ecology	Restoration Ecology
Wildlife and Fish				Wildlife and Fish Indicators		Wildlife and Fish Indicators
				Impact Identification, Assessment and Mitigation		
					Wildlife Habitat and Biodiversity	Wildlife Habitat and Biodiversity
					Fisheries Habitat and Biodiversity	Fisheries Habitat and Biodiversity
					Restoration Ecology	Restoration Ecology
Landscape				Geomorphology	Geomorphology	
	Aerial photo interpretation	Aerial photo interpretation	Aerial photo interpretation			
	Geographic Information Systems	Geographic Information Systems	Geographic Information Systems			
				Surficial Geology	Surficial Geology	Surficial Geology
	Geopositioning Systems	Geopositioning Systems	Geopositioning Systems			
				Geology	Geology	
				Terrain analysis	Terrain analysis	Terrain analysis
	Land Use	Land Use	Land Use	Land Use	Land Use	Land Use
				Impact Identification, Assessment and Mitigation		
					Restoration Ecology	Restoration Ecology

	ALBERTA WETLAND POLICY TASKS					
	Identification and Delineation	**Classification**	**Permanence**	**Wetland Assessment and Impact Report**	**Wetland Design, Restoration and Enhancement**	**Monitoring**
Knowledge Areas						
Water Resources		Water Regime	Water Regime	Water Regime	Water Regime	Water Regime
		Water Chemistry		Water Chemistry	Water Chemistry	Water Chemistry
	Hydrography			Hydrography	Hydrography	
				Hydrology	Hydrology	
				Impact Identification, Assessment and Mitigation		
					Hydrologic Modelling	
					Hydrogeology	Hydrogeology
					Restoration Ecology	Restoration Ecology
Civil Engineering					Materials Selection and Testing	
					Geotechnical Design	
					Hydrological Analysis and Modeling	
					Hydraulic Analysis and Design	
					Hydrogeology	
					Water Quality Performance Prediction	
						Stability Monitoring
Environmental Design						
					Wetland Morphology including Substrates and Liners	
					Erosion Resistance and Shoreline Stabilization	
					Vegetation Establishment Procedures	
					Wildlife Habitat and Biodiversity	
					Human Use Elements, Barriers and Safety Features	
					Restoration Ecology	

APPENDIX D: RECOMMENDED *TOOLS* AND *SKILL* SETS

TOOL OR SKILL	PURPOSE(S)
ABWRET-A	Field assessment of wetland; determination of value category
ArcGIS	Software knowledge. Geospatial data creation, processing, analysis, management, storage, quality control
AutoCAD	Construction data design, processing, analysis management, storage, quality control
Field techniques and sampling methodology	Gather and store field data using accepted methodology; ensure high quality data collection and management; GPS use
Understanding Alberta Merged Wetland Inventory	Understand wetlands and their classification in the province in Alberta for the period of 1998 to 2009
Understanding ABWRET-E	Provide preliminary estimations of proportions of wetland value categories in project area
Project management	Initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria; especially critical in the design, restoration, enhancement, and /or construction of wetlands

APPENDIX E: ACTS, POLICIES AND FRAMEWORKS APPLICABLE TO THE ALBERTA WETLAND POLICY

Provincial (Alberta)	Federal (Canada)
• Alberta Wetland Assessment and Impact Report *Directive* • Alberta Wetland Classification System • Alberta Wetland Identification and Delineation *Directive* • Alberta Wetland Mitigation *Directive* • Alberta Wetland Policy • *Environmental Enhancement and Protection Act* • *Fisheries Act* • *Forests Act* • Guide for Assessing Permanence of Wetland Basins • *Historical Resources Act* • *Land Surveyors Act* • *Land Titles Act* • *Surveys Act* • Land Use Framework and Regional Plans • *Municipal Government Act* • Municipal Stormwater and Environmental Management Policies • *Parks Act* • *Public Lands Act* • *Soil Conservation Act* • *Water Act* • *Water Act* Regulatory Requirements Guide • Water (Ministerial) Regulation • Water (Offences and Penalties) Regulation • *Weed Control Act* and Regulations • *Wildlife Act* and Regulations	• *Fisheries Act* • *Migratory Birds Convention Act* • *Navigable Waters Act* • *Species at Risk Act*