
# Technical Guidance for Offset Protocol Development and Revision

Version 2.0

July 2018

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| **Title:** | **Technical Guidance for Offset Protocol Development and Revision** |
| **Number:** | **2.0** |
| **Program Name:** | **Alberta Emission Offset System** |
| **Effective Date:** | **July 31, 2018** |
| **This document was updated on:** | **July 2018** |
| **ISBN No.:** | **978-1-4601-4061-1** |

## Disclaimer

This document is not a substitute for legal requirements. Protocol developers must comply with all applicable laws, including but not limited to those set out in the *Climate Change and Emissions Management Act* (the Act), the Carbon Competitiveness Incentive Regulation (the Regulation), and Part 1 of the Standard for Greenhouse Gas Emission Offset Project Developers (the Standard).

If there is a conflict between this document and the Act, the Regulation or Part 1 of the Standard, the Act, Regulation or Standard prevails over this guidance.

For information regarding the withdrawal and replacement of quantification protocols, see the Standard.

## Summary of Revisions

| Version | Date | Summary of Revisions |
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| 2.0 | July 2018 | The name of the guidance was changed to reflect that the document now includes guidance on protocol revision.<br><br>Updated references to Carbon Competitiveness Incentive Regulation and Standards.<br><br>Introduced a 'Request to Revise' process whereby project developers may submit a proposal to revise an existing protocol.<br><br>Provided information on internal revision process.<br><br>Introduced a selection process that is for development of new and revision of existing protocols; including timelines and selection criteria. This process replaces the previous '5-year review' with a risk based process for determining which protocols to review and when.<br><br>Clarified the consensus process.<br><br>Clarified the ISO 14064 principles.<br><br>Expanded guidance on contents and structure of protocol. Replaced most information on determining additionality with references to the Technical Guidance for the Assessment of Additionality.<br><br>Removed 'adjusted baseline' option. |
| 1.0 | January 2011 | The Technical Guidance for Offset Protocol Developers was published. |

## Table of Contents

## List of Figures



## List of Appendices

## Alberta Climate Change Office Related Publications

- *Climate Leadership Act* and Climate Leadership Regulation
- *Climate Change and Emissions Management Act*
- Carbon Competitiveness Incentive Regulation
- Specified Gas Reporting Regulation
- Standard for Greenhouse Gas Emission Offset Project Developers
- Standard for Validation, Verification, and Audit
- Carbon Offset Emission Factors Handbook
- Technical Guidance for the Assessment of Additionality

# 1.0 Purpose of this Document

The purpose of this document is to provide guidance to stakeholders wishing to develop new emission offset protocols or revise existing protocols for use in Alberta's emission offset system. This document also provides stakeholders with information to understand how the Alberta Climate Change Office (ACCO) reviews new and revises existing protocols in the Alberta emission offset system.

The impact of protocol revision on existing emission offset projects is outlined in Part 1 of the Standard for Greenhouse Gas Emission Offset Project Developers. The standard indicates that the Director may at any time withdraw a quantification protocol or withdraw a quantification protocol and replace it with a new quantification protocol. This protocol guidance document refers to the process of withdrawal and replacement with a new quantification protocol as 'revision' and provides guidance to stakeholders on the withdrawal process.

## 1.1 Glossary of Terms

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| Additionality | An action that results in greenhouse gas emission reduction or sequestration that is beyond business as usual and supplemental to all regulatory requirements. This is guided and determined by the application of the Technical Guidance for the Assessment of Additionality. |
| Alberta Emissions Offset Registry | A web-based platform that displays emission offset projects based in Alberta and tracks associated documents and emission offset data. |
| Alberta Climate Change Office (ACCO) | Regulator and program manager for the Alberta emission offset system. |
| Aggregated Project | An emission offset project with two or more emission offset subprojects that a project developer submits to the Registry as a single project. |
| Baseline | A reference case against which the performance of an emission offset project is measured. |
| Biological Sequestration | The process of sequestering carbon dioxide in biological reservoirs including trees, plants, and soil biomass. |
| Biomass | Non-fossilized and biodegradable organic material originating from plants, animals and micro-organisms. |
| Carbon Dioxide Equivalent ($CO_2e$) | The 100-year time horizon global warming potential of a unit of greenhouse gas (e.g. methane) expressed in terms of equivalency to carbon dioxide. |
| Consensus | Consensus is defined as general agreement among all parties with no sustained objection. Consensus is required at the both the Technical Review and public review. |
| Director | The Director is any person designated by the Minister of Environment and Parks under the *Climate Change and Emissions Management Act* or the regulations under this Act. |
| Emission Factor | Is a representative value that can be used to estimate the rate or quantity of greenhouse gas emissions released to the atmosphere or removed through sequestration processes. |
| Emission Reduction | Occurs when emissions released into the atmosphere by a source are decreased or eliminated. |
| Emission Removal | Occurs when $CO_2$ is removed from the atmosphere through sequestration. |
| Emission Offset Project | A project undertaken to generate emission offsets. |
| Emission Offset Project Developer | In respect of an emission offset project means the person registered as the owner of the emission offset project on the Alberta Emission Offset Registry. |

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| Global Warming Potential (GWP) | Measures a greenhouse gas's relative warming effect on the earth's atmosphere compared with carbon dioxide expressed over a 100 year time horizon. |
| Protocol Developer | Person or company responsible for coordinating the development or revision of a quantification protocol. |
| Protocol Sponsor | Company or organization championing the development of a quantification protocol for an identified reduction or sequestration opportunity. |
| Quantification Protocol | A methodology that outlines appropriate baseline conditions, applicable sources, sinks, and reservoirs, and emission reduction calculations for a specific type of emission reduction or sequestration activity. |
| Reversal | A release of carbon sequestered or stored in a biological or geological reservoir back to the atmosphere. |
| Sequestration | The process of permanently storing carbon in a biological or geological reservoir to prevent its release into the atmosphere. |
| Sink | Any process, activity or mechanism that removes greenhouse gas from the atmosphere. |
| Source | Any process, activity or mechanism that releases greenhouse gas emissions into the atmosphere. |

# 2.0 Regulatory Context for the Offset Market

In 2002, Alberta passed the *Climate Change and Emissions Management Act* signaling its commitment to manage greenhouse gas emissions in the province. In 2003, Alberta passed the Specified Gas Reporting Regulation requiring all facilities with annual greenhouse gas emissions above the specified threshold to report their emissions. In 2007, Alberta passed the Specified Gas Emitters Regulation reinforcing its commitment to regulate greenhouse gas emissions from large industrial emitters. An update of the Regulation in June 2015 increased greenhouse gas reduction requirements and the carbon price under the system. In 2016, Alberta passed the *Climate Leadership Act* which introduced the carbon levy, pricing emissions from the use of transportation and heating fuels. In December 2017, Alberta passed the Carbon Competitiveness Incentive Regulation (CCIR) which replaces the Specified Gas Emitters Regulation and became effective January 1, 2018.

Carbon pricing is a means to encourage efficient emission reductions throughout the economy. The Alberta emission offset system is a market-based compliance option for facilities regulated under the Carbon Competitiveness Incentive Regulation. Facilities unable to meet their emission reduction obligation through direct facility improvements may choose to purchase emission offsets generated at facilities or through activities not subject to the Regulation or priced through the carbon levy. The emission offset system provides flexibility to facilities in meeting their reduction obligations and extends the carbon price beyond emissions directly priced under the CCIR or the carbon levy.

## 2.1 Offset System Principles

The Alberta emission offset system is designed to incent cost-effective verifiable reduction or sequestration of greenhouse gas emissions that are not otherwise directly priced or required by law. The following key principles guide the development and implementation of the system:

- Reduce Provincial Emissions: offset projects must result in real, quantifiable, and verifiable reduction or sequestration of greenhouse gas emissions in Alberta;
- Building and Linking: Alberta will continue to build on offset work undertaken in other jurisdictions to adapt emission reduction opportunities to suit Alberta's unique circumstances and will seek alignment between systems as deemed appropriate;

- Reasonable Program Administration: ACCO will, to a practicable extent, seek to balance administrative costs against program implementation;
- Improvement: protocols must support incremental or disruptive improvement in technology and/or practice; and,
- Transparency and Accountability: Alberta supports full transparency of quantification protocol development, offset projects and supporting information for projects registered on the Alberta Emissions Offset Registry.

### 2.2 Offset Protocol Design

Quantification protocols outline an activity-specific emission reduction methodology based on best available science, tailored to Alberta-specific conditions. These protocols provide a common methodology for emission reduction or sequestration activities (emission offset projects) that ensure projects result in real, quantifiable and verifiable emission reduction or sequestration.

Section 16 of the Carbon Competitiveness Incentive Regulation defines the requirements that must be met for an offset project to be eligible to generate emission offsets for use as a compliance option in Alberta. Protocol developers are expected to familiarize themselves with the regulation requirements along with the requirements of this document. Protocols must be developed for emission reduction or sequestration activities that will occur in Alberta so that the emission offsets that are generated will be generated in Alberta.

## 3.0 Protocol Development and Revision Process

The protocol development process applies to developing a new offset protocol and is initiated when a protocol developer submits a "Request to Develop" to ACCO. The protocol revision process applies to revising an existing offset protocol and is initiated when a protocol developer submits a "Request to Revise" or when ACCO determines through the internal risk assessment process outlined in Section 3.2 that a protocol is selected for revision. ACCO evaluates requests to develop and requests to revise together and selects which protocols will be developed or revised. Available resources, magnitude of potential reductions and internal priorities are contributing factors in the selection process. This may mean that not all requests can be selected for development or revision.

ACCO will evaluate and select which protocols will be developed and/or revised each year. The protocol development and revision process is intended to take one to two years, but can take longer in cases where additional information is required or significant issues must be overcome.

When a new protocol is being developed, participants in the technical review and the draft protocol stage must achieve consensus. Development of a new protocol may be discontinued at any point in the process if consensus is not achieved and/or if ACCO determines the protocol does not meet program requirements. When an existing protocol is being revised, stakeholders must also achieve consensus at each stage. If consensus is not achieved and/or if ACCO determines the protocol no longer meets program requirements, the protocol may be withdrawn. The consensus process is discussed in more detail in Section 3.10.

Protocols under development may be discontinued at any point in the protocol development process if the protocol fails to meet Alberta emission offset program requirements, climate change policy objectives, regulatory requirements, additionality considerations, has permanence issues, or unresolved sustained objections. Generally speaking, the likelihood of discontinuance decreases as the protocol moves through the development/revision process if all previous reviews have been completed in sufficient detail to provide transparent understanding of decisions being made.

If a draft protocol becomes inactive for a period of one year due to intentional inactivity on behalf of the project developer, the proposed protocol will expire. ACCO will issue a letter to the protocol developer advising the protocol has been inactive and may expire. The protocol developer will need to contact ACCO to discuss options if they wish to continue working on the draft protocol.

Expired protocols must be reintroduced into the protocol development process as a new protocol. The protocol developer will need to submit a new Request to Revise or Request to Develop proposal, including an explanation of the issues that caused the earlier submission to expire and how those issues have been resolved.

Figure 1 outlines the protocol development and revision process and approximate timelines. The sections that follow describe the process in further detail.

**Figure 1: Protocol Development and Protocol Revision Process**

## 3.1 Key Participants

The involvement of a broad range of stakeholders during the protocol development process helps to ensure that comprehensive and transparent protocol development and revision. Key participants and when they are likely to engage in the protocol development process.

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| Academic Experts | This includes persons with expertise and relevant research experience in protocol topic areas. Academic experts should be consulted during the Technical Review and assessment of the background science and assumptions being applied to the reduction or sequestration activity. |
| Consultant | This is a person or company with relevant expertise and background experience hired by the protocol sponsor to develop the quantification protocol. Hiring a consultant is not required when developing a protocol if the protocol sponsor has the necessary expertise and experience. |
| Government of Alberta | Alberta Climate Change Office, on behalf of the Government of Alberta, is the regulatory body that establishes the program rules and oversees the implementation of the Carbon Competitiveness Incentive Regulation. The Alberta Climate Change Office is responsible for approving quantification protocols and reviewing, revising and up-dating standards, guidance, regulations, quantification protocols and related materials. |
| Industry Expert | People working in the field that have relevant technical, business and/or market experience. These experts may or may not have relevant academic qualifications and technical expertise. Industry experts may be protocol sponsors and may participate in the technical review, and/or public review. |
| Non-Government Organizations | Non-government organizations are typically not-for- profit organizations working to advance social, environmental, and similar issues through advocacy, awareness and engagement. Appropriate non-government organizations should be included in the technical review process. |
| Protocol Developer | The protocol developer is responsible for initiating and developing the quantification protocol. This person or company will act as the key contact and will typically coordinate research and information review; develop draft materials; and liaise with stakeholders, government, and the protocol sponsor. The protocol developer may be the protocol sponsor or be a consultant hired by the protocol sponsor and should have appropriate subject matter expertise and familiarity with the Alberta emission offset system. ACCO may act as the protocol developer. |
| Protocol Sponsor | The protocol sponsor is a company or organization championing the development of a quantification protocol. The protocol sponsor may develop the protocol directly or engage a consultant to undertake the work. The protocol sponsor is required to fund the development of the quantification protocol. |
| Public | Any person with an interest in the protocol and associated reduction or sequestration opportunity and may have varying level of understanding of the activity, offset program requirements, and emission reduction or sequestration opportunities. The public would typically engage during the 30-day public review. |
| Third-Party Assurance Provider | The third-party assurance provider is an independent third party that meets the qualifications outlined in section 24 of the Carbon Competitiveness Incentive Regulation. Protocol developers must engage and work with a third party assurance provider during the protocol development process to ensure records and project documentation are able to support verification requirements. |

## 3.2 Protocol Developer Submissions

Protocol developers can apply for approval to develop a new protocol or revise an existing protocol in Alberta's emission offset system by submitting a Request to Develop or a Request to Revise application. Request to Develop and Request to Revise applications will be accepted by ACCO until December 31 of each year. ACCO will evaluate submissions received between January 1 and December 31 of the previous year in the first quarter of each year. Maintenance of existing protocols takes precedent over developing new protocols; in some years, this may mean no development of new protocols. All protocol documentation described below must be received by ACCO within the document submission deadlines. The requests must follow the prescribed format and content of the templates in Appendix A and B. Submissions must be received by e-mail: e-mail headers should include "Request to Develop" or "Request to Revise" within the subject line. Submissions must be directed to AEP.GHG@gov.ab.ca.

### 3.2.1 Request to Develop

The first step in the protocol development process is to identify a greenhouse gas emission reduction opportunity for one or more of the covered emissions (refer to Schedule 1 of the Carbon Competitiveness Incentive Regulation for a list of covered emissions). The reduction opportunity must result in quantifiable emission reduction or sequestration in Alberta and meet all requirements stated in the *Climate Change and Emissions Management Act*, the Carbon Competitiveness Incentive Regulation, the Standard for Greenhouse Gas Emission Offset Project Developers, and this document. If the activity meets these requirements, the protocol developer should review the list of approved protocols to determine whether the activity is already covered under an approved protocol. If this activity is covered under or relates to, but is not an exact fit with an approved protocol, the protocol sponsor should work with ACCO to assess whether a Request to Revise an existing protocol or a protocol deviation request would be more appropriate. Guidance on how to apply for a protocol deviation is provided in the Standard for Greenhouse Gas Emission Offset Project Developers Part 2, section 1.7.

If the result of the above assessment is that there is no suitable existing approved protocol, a protocol developer may submit a Request to Develop proposal to ACCO. The Request to Develop proposal is a screening tool used by ACCO to assess the eligibility and feasibility of a reduction opportunity within the Alberta emission offset system. This proposal document will also be used by ACCO to inform selection of annual priorities for protocol development and review. This document must be sufficiently complete and detailed to provide ACCO with an overview of the proposed activity, assumptions, and emission reduction or sequestration potential. It must provide a rationale for why the protocol is needed, how it will result in emission reductions in Alberta, and how it will meet additionality criteria. The Request to Develop template is included in Appendix A.

### 3.2.2 Request to Revise

The Request to Revise proposal will be used by ACCO to select external protocol developer proposals for revision of existing protocols in Alberta's emission offset system. If a protocol developer desires to revise a protocol to incorporate an additional activity, the activity can be included either through a full revision of the existing protocol or the addition of a flexibility mechanism. The Request to Revise template is available in Appendix B.

If a project developer identifies a reduction or sequestration activity that is closely related to an approved protocol, but is not included in the scope of the protocol, the project developer may submit a Request to Revise proposal to ACCO. The Request to Revise proposal must clearly identify and include:

- The protocol being considered and specific sections in the protocol in question that the protocol developer proposes to revise;
- A detailed description of the proposed revision and how it aligns with program requirements;
- An additionality worksheet completed in accordance with the Technical Guidance for the Assessment of Additionality;
- Analysis and impact assessment of the revisions on the approved protocol; and,

Records and quantification methods applicable to the proposed revision, including the accuracy of the proposed approach relative to published quantification requirements and published science.

## 3.3 Internal Protocol Risk Assessment and Initial Protocol Review

ACCO conducts an annual risk assessment of approved protocols to identify protocols for review and potential revision. The risk assessment is conducted internally by department staff. ACCO conducts an initial review and identifies which protocols should be considered for a more comprehensive review. The outcome of the initial review will be categorized as follows: major revisions anticipated, minor revisions anticipated, or removal anticipated. Examples of major revisions include: changes in scope, changes in flexibility options, review of emission factors, updates to quantification methodology, and changes to records requirements. Examples of minor revisions include: typographical errors and clarifications, but do not include changes in scope. Examples of a reason to withdraw a protocol may include: regulatory changes, overlap with direct carbon pricing, no uptake, or the activity is no longer additional.

During the annual internal protocol risk assessment, ACCO assesses:

- Time since protocol was last reviewed,
- Known issues with the protocol including any relevant results from re-verifications, or changes to additionality,
- If the protocol needs to be aligned with other policies or initiatives,
- The number of projects using the protocol,
- If the protocol is commonly used for aggregated projects, and
- The volume of tonnes registered under the protocol.

### 3.3.1 Flagging Protocols

If ACCO identifies that a protocol may be withdrawn or revised it will flag the protocol. ACCO may flag a protocol at any time by sending communication to stakeholders and publishing it on the ACCO website. ACCO may determine that a protocol will be flagged during the internal protocol review and initial protocol risk assessment or at any other time. If a protocol is flagged it will be identified as such on the offsets website

Once a protocol has been flagged by ACCO, offset project developers require the Director's permission to use the protocol. Depending on the reason the protocol is flagged the Director may allow a project developer to use the flagged protocol under certain conditions, or not allow the project developer to use the protocol until the protocol is revised.

If a protocol is flagged it may not be revised or removed immediately, rather the reason it is flagged will be a consideration in the internal protocol risk assessment conducted by ACCO and will be scheduled for revision or removal relative to the importance of other protocols that require revision As per Part 1 section 4 of the Standard for Greenhouse Gas Emission Offset Project Developers, a project developer must receive written authorization from the director to initiate a project using a flagged protocol.

## 3.4 Selection

If a large number of protocols are identified for review during ACCO's internal protocol risk assessment process there may be a very limited capacity for acceptance of external Request to Revise and Request to Develop proposals. In some years, ACCO may be required to focus completely upon review and revision of protocols identified during the internal protocol risk assessment, which may prevent development of new protocols. Revision of existing protocols takes priority over development of new protocols.

ACCO evaluates Requests to Develop and Requests to Revise together and evaluates and selects which protocols will be developed or revised. In order to enable reasonable timelines for selected protocols, the total number of proposals selected for development and/or review per year will depend on:

- availability of internal resources to oversee protocol development or review, and
- the number of protocols currently under review or revision in the Alberta emission offset system.

Follow-up meetings with the protocol developer and/or sponsor to discuss the activity or revision being proposed may be required. Emphasis will be placed on:

- Baseline condition including ability to quantify and measure or estimate pre-project emissions, and ability to clearly define the project boundary;
- Project condition including relevant supporting science from peer reviewed literature, availability of technology, ability to quantify the reduction or sequestration opportunity, ability to quantify and manage uncertainty, and consistency with program requirements;
- Additionality including application of the additionality worksheet outlined in the Technical Guidance for the Assessment of Additionality;
- Emission offset reduction or sequestration potential at a project level and at a protocol level;
- Types of records available to support the activity;
- References and experts available to review the proposed protocol; and
- Other government initiatives to ensure that, at a high level, the proposed protocol is aligned with and does not overlap with other policies and/or regulations.

Selection of a Request to Revise or Request to Develop proposal by ACCO does not guarantee that the protocol proposal will be accepted as an approved protocol. All selected protocol proposals must successfully move through the protocol development and revisions process and receive final government approval before they can be used as protocols under the Alberta emission offset system. ACCO is not obliged to accept any protocols and may stop development of a protocol at any point in the protocol development process if it is determined the protocol does not meet program requirements, climate change policy objectives, and other regulatory requirements.

Once the selection is complete (typically by end of first quarter) ACCO will notify the protocol developer in writing whether or not a protocol is selected for development or revision. ACCO will inform protocol developers why a request was not accepted and under what conditions a request may be reconsidered in the future. For example, requests not accepted due to competing priorities may be resubmitted in the following year to be reconsidered for selection. Another example is if a request is not accepted due to unavailable science the request will not be reconsidered until the protocol developer can demonstrate that appropriate science is available to support protocol development.

### 3.4.1 New Protocol Development

If ACCO selects a new protocol for development the protocol developer will have the opportunity to progress through the protocol development process and proceed to the Technical Review stage outlined in Figure 1.

### 3.4.2 Major Revision

A major revision may be proposed by a protocol developer or may be proposed by ACCO during the protocol review. If ACCO selects an existing protocol for revision and anticipates that a major revision will be required the protocol will proceed to the Technical Review stage. In some cases it may be possible to revise an existing Technical Seed Document and in some cases the protocol developer (or ACCO) will need to create a new Technical Seed Document.

### 3.4.3 Minor Revision

If ACCO selects an existing protocol for revision and anticipates that only minor revisions will be required, the protocol will be withdrawn and revised and posted for a 30-day public comment period, with no Technical Review required.

### 3.4.4 Proposed Withdrawal

If ACCO anticipates that a protocol may need to be withdrawn, ACCO will conduct an internal analysis to determine the impact of removing the protocol. A notice will be sent to stakeholders indicating the proposed withdrawal of the protocol and seek public comments for a 30 day period. ACCO will evaluate

stakeholder comments and the results of the internal assessment and make a decision about whether to withdraw the protocol.

## 3.5 Technical Review

If a request to develop protocol is selected for protocol development, a team of subject matter experts coordinated by the protocol developer will be expected to champion the technical development for the protocol. This team (described below) will produce a technical seed document, which will be reviewed by technical experts approved by ACCO, and if accepted, will provide the basis for developing a draft quantification protocol. The technical development and review process is outlined in Figure 2.

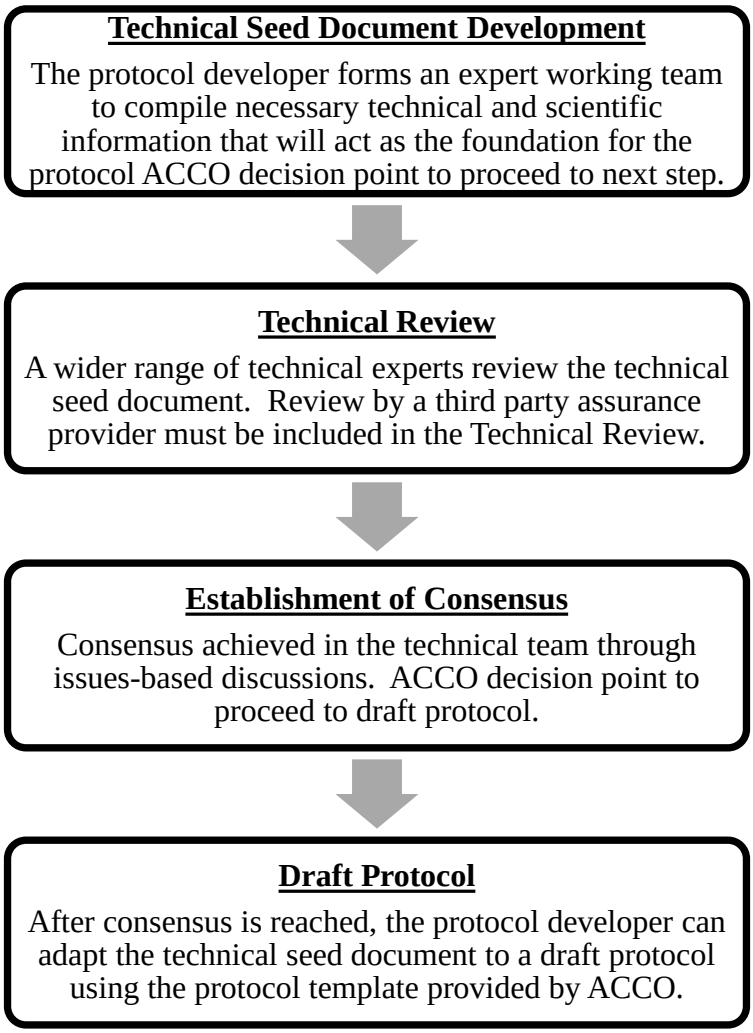
If a protocol requires major revisions and there is an existing technical seed document it may be possible to revise the existing Technical Seed Document. In some cases the protocol developer (or ACCO) will create a new Technical Seed Document.

The first step in this process is to develop the technical seed document, which is a detailed analysis of the background information relevant to the reduction or sequestration activity.

The technical seed document is usually compiled by an expert working team consisting of several subject matter experts and may include a consultant with relevant protocol development experience. This expert working team must be able to demonstrate subject matter expertise and is responsible for compiling scientific and background information, developing quantification equations for the activity, assessing and comparing sources, sinks, and reservoirs in the baseline and project condition to determine the reduction or sequestration activity and associated equations, and review the proposal for completeness against technical knowledge and the Alberta emission offset system requirements.

The technical seed document is the underpinning technical resource that guides the adaptation of technical elements of the reduction or sequestration activity into a protocol template. It establishes the scientific basis of the greenhouse gas quantification approach. The document(s) must represent the best available science and technical information relating to the project activity to connect the science and technology information to the greenhouse gas requirements pertaining to the activity as applicable in Alberta.

**Figure 2: Technical Review Process**



The technical seed document must address the following:

- Explanation of the project type, including a clear description of the activity generating the emission reduction or sequestration;
- Best practice guidance used to support the activity. This may include protocols from other jurisdictions such as the Clean Development Mechanism (CDM), or approaches used to meet obligations under the Paris Agreement;
- Mechanisms for addressing permanence and leakage;
- Explanation of how the activity is additional based on the completion of the worksheet in the Technical Guidance for the Assessment of Additionality;
- Discussion on business as usual, common practice, level of uptake, and regulatory requirements;
- Barriers to implementation;
- Review of science, relevant research, and/or technology appropriate to the activity;
- Example calculations;
- Record requirement to demonstrate emission reduction or sequestration;
- Assessment of and justification for the baseline scenario selected;
- Evaluation of sources, sinks, and reservoirs in the baseline and project condition; and
- Any flexibility mechanisms applicable to the activity.

The technical seed document must undergo a Technical Review by a wider range of technical experts with a goal of representation from the technical working group, government representatives, non-government organizations, academics, project developers and other parties that will be directly affected by the protocol or that can provide a rigorous vetting of the concepts being presented. The Technical Review involves at least one meeting with the technical working group, and more than one if needed. The meeting will be led by the protocol developer and the consensus process will be applied. The composition of the review team will vary by protocol and activity type; the protocol developer must strive to bring together an objective team to review the proposed reduction or sequestration activity. The protocol developer must provide a list of the technical review team to ACCO for review and approval. ACCO reserves the right to request additional technical experts be included to ensure an objective and balanced review.

The Technical Review will assess the proposed emission reduction or sequestration activity for:

- Environmental integrity of the assumptions and activity/project to ensure reduction or sequestration is real, quantifiable, and verifiable;
- Completeness of the sources, sinks, and reservoirs;
- Usability of the methodology and reduction or sequestration activity to ensure reasonableness of assumptions against program requirements using consistent, conservative approaches to decide what needs to be quantified in baseline and project;
- Consistency with similar approved protocols, but correctly adapted to the Alberta emission offset system;
- Consistency of the streamlined life cycle analysis approach applied to the reduction or sequestration activity is consistent with the ISO 14064-2 framework; and
- Any other technical or scientific issues that may be identified.

A third-party assurance provider must be included on the Technical Review team.

The technical seed document must have no sustained objections in order to be approved for adaptation into a draft quantification protocol (see Section 3.10 for more information on consensus). This draft protocol must be presented to the technical review team for assessment. Any outstanding questions or concerns must be addressed. If the draft protocol has no sustained objections, it, along with the technical

seed document, are submitted for Department Review. If there are no outstanding concerns during Department Review, ACCO will post the protocol on the offset website for Public Review for 30 days.

The Technical Review process for a new protocol will typically take between six months and two years to complete and is the most intensive and time-consuming part of the protocol development process. The level of effort required will vary depending on the complexity of the reduction or sequestration activity, the amount of original research required to support the activity, the availability of records to support the activity, etc. Greater emphasis and time spent during this phase will yield a more robust protocol with less likelihood of being halted later in the protocol development process. The developer may flag unreasonable/intentional delays during the Technical Review process to ACCO for attention and ACCO will facilitate a consensus process.

ACCO will provide a template for the technical seed document once a protocol has been selected for development or revision. Completed technical seed documents will be available upon request but will not be published.

### 3.5.1 Additionality

During the technical review stage the protocol developer must be able to demonstrate that the reduction or sequestration activities being quantified in the protocol result in an emission reduction or sequestration of greenhouse gases that is additional to business as usual. Additionality applies four main concepts: Financial, Emissions, Regulatory/Legal, and Technological. The Alberta approach to assessing additionality considers each of these concepts at various stages in the assessment. Additionality is primarily assessed at the protocol level, and protocol developers are required to demonstrate the activity is additional by applying the Technical Guidance for the Assessment of Additionality in support of their protocol development process, and submission.

Protocol developers must use the additionality worksheet provided in the Technical Guidance for the Assessment of Additionality to demonstrate that an activity is:

- not required by law, regulation, by-law or directive in Alberta, or Canada;
- aligned with the guidance on penetration rate in the Technical Guidance for the Assessment of Additionality (the activity is not common practice within a sector); and,
- results in a net reduction or sequestration in greenhouse gas emissions and improved environmental practices.

Please see the Technical Guidance for the Assessment of Additionality for further information and requirements.

## 3.6 Internal Review and Revision

Protocols that are expected to have minor revisions will be channeled into ACCO's Internal Review and Revision process and may not require a full Technical Review. Protocols selected from the internal protocol risk assessment and Request to Revise applications may also be routed into Internal Review and Revisions if the revisions are expected to be minor. ACCO may redirect protocol revisions from Internal Review to Technical Review at any time (indicated by dashed line in Figure 1). A redirection from Internal Review to Technical Review may occur if edits appear to have broader impact than originally anticipated or if additional issues arise that require technical input/discussion.

## 3.7 Department Review

Draft protocols that have completed either Technical Review and/or Internal Review move to the Department Review stage in the process. Upon receiving draft protocol and technical seed documents, ACCO will initiate a review of the protocol, including participation of applicable government departments.

While some government departments may choose to participate in the Technical Review and at other stages in the protocol development and review process, ACCO may also ask other ministries or departments to review the draft protocol to ensure that related policy issues are addressed and that the protocol being presented has been viewed by all affected departments.

Protocol developers should allow several months for the Department Review depending on how involved other government departments are in the protocol development process.

Department staff will review the protocol to ensure it meets system requirements and will also be reviewed by the Director prior to being posted for public review.

## 3.8 Public Review

Draft protocols which have completed Department Review will be posted on the ACCO website for a formal 30-day public comment period.

In the event that significant unresolved issues are raised, ACCO will work with the protocol developer and Technical Review team to address issues and reach a consensus. The protocol must have no unresolved objections to be considered for final approval. Further information on consensus can be found in Section 3.10. If issues cannot be satisfactorily addressed, the draft protocol will not be approved for use in Alberta's emission offset system.

## 3.9 Approval and Publication

Comments received during the Public Review will be compiled and evaluated for incorporation into the final document. ACCO will prepare a response to each comment in a table that will be made available to stakeholders upon request.

Protocols that have no unresolved objections and meet the requirements of the Alberta emission offset system will be presented to the Director for final review and approval. Project developers may initiate a project using the new protocol once the final approved version is available and posted on the ACCO website. Refer to the Standard for Greenhouse Gas Emission Offset Project Developers for details on when existing projects are expected to use revised protocols.

## 3.10 Consensus Process

The consensus process for protocol development has been adapted from the Clean Air Strategic Alliance (CASA) and Canada's National Round Tables on Environment and Economy Building Consensus for a Sustainable Future (1993).

Consensus is defined as general agreement among all parties with no sustained objection. Consensus is required at the Technical Review stage for adaptation into a draft quantification protocol. Consensus is also required after the public review where ACCO, the protocol developer and the technical review team must resolve any significant issues raised during the public comment stage of the protocol development process.

Consensus is best achieved through issues-based negotiations, in which parties present issues, seek to understand, and work towards solutions. Participants involved in the Technical Review must be prepared to contribute to the development process through participation, development of materials, research, and analysis to support the protocol development process.

If a participant does not support the outcome of the Technical Review, the participant can file a written objection to ACCO. The written objection must clearly document the issue or issues, justification for the objection, and alternate approach being proposed. Supporting documents including peer reviewed articles, scientific research, annual reports and other evidence must be presented with the written objection. ACCO will review the objection and supporting information. Objections that cannot be substantiated with evidence will not be considered. The technical seed document must not contain any unresolved objections, in order to be approved for adaptation into a draft quantification protocol.

ACCO will contact the technical review team to discuss the rationale for the proposed approach and seek to understand the objection. ACCO reserves the right to issue a final decision. ACCO may:

- Uphold the objection.
    - If the complaint is upheld, the protocol is returned to Technical Review for further work.
    - If the Technical Review cannot reach a consensus, ACCO may:
        - Assign a path forward,
        - Trigger an arbitration process to resolve the issue.

- Uphold the approach proposed by the expert working group.
    - If the objection is overturned, the protocol will continue in the protocol development process.

More information on consensus process is available in the following documents:

- Beyond Consultation: Making Consensus Decisions. Clean Air Strategic Alliance. 2007.
- Building Consensus for a Sustainable Future: Guiding Principles. Canadian Round Tables on Environment and Economy. 1993.
- Guide to Managing Collaborative Processes. Clean Air Strategic Alliance. 2014

# 4.0 Alberta Offset Principles

The Alberta emission offset system is based on ISO 14064-2– Greenhouse Gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reduction or sequestration for establishing and quantifying greenhouse gas emission reduction or sequestration projects (ISO 1404-2). A quantification protocol provides a standardized approach for quantification, monitoring and reporting of greenhouse gas emission reduction or sequestration for an activity. Specific quantification methodology, science based emission factors, and other parameters must be applicable to Alberta conditions.

The following principles are adopted from ISO 14064-2 into this protocol guidance:

- Relevance,
- Completeness,
- Consistency,
- Accuracy,
- Transparency, and
- Conservativeness.

Where practical, Alberta also draws on related protocols from other jurisdictions to inform its protocol development process. Emission reduction or sequestration quantification methodologies must be tailored to reflect Alberta-specific conditions, and may not, in all cases mirror quantification methodologies and approaches used in other jurisdictions. External jurisdictions which Alberta draws from include, but are not limited to:

- Clean Development Mechanisms (CDM);
- The Intergovernmental Panel on Climate Change (IPCC);
- The National Inventory Report: Greenhouse Gas Sources and Sinks in Canada (Environment Canada, Annually since 1990)
- The World Resources Institute (WRI);
- Western Climate Initiative (WCI) including Ontario, Quebec, California and British Columbia; and
- World Business Council on Sustainable Development (WBCSD).

Project developers and persons interested in developing protocols for the Alberta emission offset system must, at a minimum, familiarize themselves with the ISO 14064-2 standard, and review relevant materials from other systems as preparatory work for advancing protocols in Alberta. The principles are discussed further in the following sections.

## 4.1 Relevance

Relevance is a principle presented in ISO 14064-2 that is intended to be program neutral. The Alberta emission offset system applies the principle of relevance when determining relevant sources, sinks and reservoirs controlled, related, or affected by an offset project. The Alberta emission offset system also uses the terms leakage and project boundary when further defining relevance. These concepts are linked to the concept of additionality of activities, in that an activity must always result in a net emission reduction or removal, to be considered additional.

There are three types of leakage that may occur: activity-based, market, and temporal leakage. Activity-based leakage occurs when the implementation of an activity or project shifts emissions outside of the project boundary. Leakage may occur, for example, when a project switches from natural gas powered equipment to electricity powered equipment if upstream electricity emissions were not included in the quantification. If, as the result of this activity, emissions are simply shifted outside of the project boundary, and result in a net increase in emissions, activity-shifting leakage has occurred.

Leakage may also occur if incentives to preserve one area cause the adverse action to occur at another location. For example, if an incentive to conserve a portion of forest and prevent its destruction in one area, led to an increase in pressure and subsequent emissions from a forest in another area, this would be considered market leakage.

Temporal leakage refers to leakage from emission reduction or sequestration that does not result in permanent emission reduction or sequestration. These are often referred to as reversals or non-permanent emission reductions. More commonly, ensuring no temporal leakage is referred to as permanence.

Leakage must be assessed during protocol development to ensure that emission reductions or sequestration claimed during the project condition represent real emission reductions or sequestration. Protocols must speak to criteria and conditions used to manage leakage to ensure projects result in real emission reductions or sequestration. Examples of leakage management tools include: monitoring plans, carefully defined project boundaries, and conservative application of emission factors. If leakage cannot be managed, or if the impact of the shifted emissions is greater than the savings at the project, the activity will not be considered additional and will not progress for protocol development in the Alberta emission offset system.

## 4.2 Completeness

Completeness is a principle that all relevant greenhouse gas emissions sources, sinks, and reservoirs should be included as well as all relevant information to support a reduction or sequestration. In the Alberta emission offset system this means defining the spatial and temporal boundaries of an emission reduction or sequestration project.

Emission reduction or sequestration achieved in the offset project are accounted for, and reported based on a lifecycle analysis for both the baseline and project condition. The baseline and project condition (emissions and production or unit of measurement) must be separated and monitored independent of the rest of a larger operation or facility. For example, if the project is at an industrial site, sufficient records and meters must be available to isolate the baseline and project to assess greenhouse gas reduction or sequestration achieved by the project. The protocol must clearly define the boundaries of the emission reduction or sequestration activity and, where applicable, provide clear instruction to the project developer to define boundaries for the offset project.

Emission reduction or sequestration achieved in the offset project are accounted for, and reported on for specific time periods. The timeline of the baseline condition must be clear in the protocol, as well as the timeline for the project condition. Some agricultural and forest harvest projects may need to be adjusted to reflect the project constraints (e.g., growing season, harvest season).

Protocols that have the potential to count emission reduction or sequestration under more than one protocol or recognition scheme must address this risk and identify mitigation strategies during protocol development to ensure that emission reduction or sequestration are only registered and used once.

## 4.3 Consistency

Consistency is a principle that if followed will enable meaningful comparisons in greenhouse gas information. For offset protocols, the baseline and project condition must have a common unit of measurement to compare emission reduction or sequestration achieved during the project condition against the emissions in the baseline condition. Consistency is achieved by using the same accounting principles and quantification methods from year to year, between baseline and project and, where applicable, throughout the Alberta emission offset or carbon pricing systems.

Emission reductions or sequestration are calculated by comparing greenhouse gas emissions in the project condition relative to the baseline condition. In order for this comparison to be meaningful, the project and the baseline must provide the same function and quality of products or services. This is known as functional

equivalence. This consistency in metrics and units of production provides an ability to compare scenarios based on the ability to quantify actual emission reductions or sequestration achieved in the project condition.

In some cases, the project condition, by definition, cannot have the same units as the baseline. An example of this would be the biofuel protocol, which seeks to displace conventional fuel with biofuel. In this case, the common metric would be the energy content of each fuel, reported as MJ.

## 4.4 Accuracy

The principle of accuracy is intended to reduce bias and uncertainties as far as is practical. Accuracy is satisfied by avoiding bias from estimation and describing and improving precision and uncertainties. Protocol developers should pursue accuracy, while recognizing the potential limitations on accuracy. The hypothetical nature of baselines and potential high costs of monitoring may limit a project or protocol's accuracy. The principle of conservativeness should serve as a moderator to accuracy and the principles are interrelated.

The protocol development process should quantify any uncertainty or potential inaccuracy associated with the quantification methodology. Justification must be provided that explains why the methodology included in the protocol is the most accurate methodology achievable and if not how the principle of conservativeness is applied to the situation.

Accuracy can vary depending on the quantification methodology. Direct measurement is usually considered more accurate than engineering estimates or use of emission factors. However, direct measurement may not be practical for every situation and in some cases, the most accurate methodology available may be cost prohibitive relative to the project. Protocol developers must assess the accuracy associated with the various quantification methodologies and provide justification for why the methodology proposed in the protocol is the most appropriate for the offset project.

## 4.5 Transparency

The principle of transparency ensures that sufficient and appropriate information is available to allow users of the offset system to make decisions about an offset project. Transparency relates to the degree to which information is seen as open, clear, factual, and neutral and presented in such a way that enables internal or external reviewers to attest to its credibility (i.e. verifiable). The protocol should provide guidance to project developers on how to ensure a project is transparent. Specific examples of transparency include:

- Clearly stating and documenting assumptions,
- Providing references,
- Stating calculations and methodologies,
- Identifying changes to documents,
- Compiling information in a way that enables verification,
- Documenting the application of principles,
- Documenting the determination of additionality,
- Documenting assumptions, references and methodologies, and
- Documenting external factors to the project that may affect the decision of intended users.

## 4.6 Conservativeness

The principle of conservativeness ensures that greenhouse gas emission reductions or sequestration are not overestimated. Conservativeness is applied when highly uncertain parameters or data sources are relied upon.

Conservativeness ensures that emission reductions or sequestration being claimed by a project are not overstated and must be assessed within the range of uncertainty associated with the proposed quantification methodology. The protocol developer is required to document the analysis, including any assumptions, and decisions around the conservativeness used in developing the quantification methodologies for the reduction activity. Conservativeness is not meant to replace accuracy. Quantification protocols must find an appropriate balance between conservativeness and accuracy. The uncertainty range of a parameter must be understood in order for a quantification methodology to be approved.

# 5.0 Elements of a Protocol

Emission offset quantification protocols in Alberta must be developed in a consistent method and similar layout and include the elements outlined below. ACCO will provide protocol developers with a current template for the protocol once the technical seed document is drafted.

## 5.1 Introduction

The introduction to the protocol should include details and instructions to project developers on the scope and applicability of the protocol. The introduction includes protocol specific information such as flexibility mechanisms and offset crediting period.

### 5.1.1 Protocol Scope

The scope of the protocol includes the temporal and physical boundaries for the protocol and projects that may use the protocol. The scope must indicate whether the protocol will quantify greenhouse gas emission reductions or sequestration. The Carbon Competitiveness Incentive Regulation enables emission offsets from reduction or sequestration (which includes biological sequestration) and geological sequestration. Geological sequestration occurs when greenhouse gas emissions are captured at the emission point and transferred into geologic formations for long-term storage using processes like enhanced oil recovery and direct injection. Risk of reversals associated with geological sequestration must be addressed during protocol development. Any records or documents required to demonstrate the permanence of sequestration must be outlined in the protocol.

Biological sequestration is a naturally occurring process of storing carbon in the biosphere, but can be enhanced by human activities. The biosphere includes trees and plants that remove $CO_2$ from the atmosphere through photosynthesis and incorporate the carbon into the trees or plant biomass. Soil microbe decomposition converts the plant biomass residues into soil organic carbon. Different biological sequestration pathways (trees, soil organic carbon, and belowground biomass) have different carbon uptake rates. Some of these pathways can be enhanced by human activities, but that enhancement needs to be correctly quantified to measure the sequestration opportunities for a particular reservoir.

Some forms of biological sequestration are potentially reversible activities. As long as the reservoir is maintained, the carbon is absorbed and stored. If biological sequestration activities are reversed, stored carbon will be released back to the atmosphere and the sink will become an emission source. ACCO recognizes the value of maintaining and improving biological sinks in the province and takes into account these time-based events during the development of the quantification protocols and quantification methodology. The protocol developer and technical review team must acknowledge and recognize this during the development or revision process. A biological sequestration protocol must identify records or documents or systems that demonstrate the permanence of sequestration.

### 5.1.2 Protocol Applicability

The applicability section in the protocol should indicate which project types or reduction activities are eligible for offsets using the protocol. Reduction activities must result in reduction or sequestration of greenhouse gas emissions regulated under the *Climate Change and Emissions Management Act*. These emissions include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulphur hexafluoride ($SF_6$). A complete list of eligible greenhouse gases are included in Schedule 1 of the Carbon Competitiveness Incentive Regulation. Relevant 100-year global warming potentials are provided in the Standard for Completing Greenhouse Gas Compliance and Forecasting Reports.

### 5.1.3 Protocol Flexibility

Flexibility mechanisms may be developed to expand the scope and level of rigour applied to a protocol to result in better greenhouse gas emission reduction quantification. These flexibility mechanisms can only be developed for project conditions where there is sufficient data to support the project scenario covered under the mechanism. Flexibility mechanisms cannot offer a less rigorous quantification approach.

Flexibility mechanisms vary between protocols and are not required in all protocols.

Examples of flexibility mechanisms include: the ability to use site-specific emission factors instead of default factors; the use of more detailed, site specific monitoring methodologies; and the ability to add or remove sources, sinks, and reservoirs based on their applicability (as long as conservativeness is maintained).

Flexibility mechanisms may also include related projects that require co-implementation with the protocol project condition or where the activity is similar and sufficiently closely related to the approved project condition that it does not merit a separate protocol, but can leverage work already vetted through the protocol development process.

### 5.1.4 Offset Crediting Period

If a protocol has an offset crediting period other than 8 years with potential 5 year extension(s), the potential offset crediting period must be outlined in the protocol under a separate heading entitled 'offset crediting period'. The offset crediting period will be evaluated during all stages of the protocol development process. See the Technical Guidance for Assessing Additionality for more information of offset crediting periods.

## 5.2 Baseline Condition

The baseline condition for a project is a reasonable representation of conditions that would likely have occurred during the offset project period if the offset project had not been implemented.

Baseline options are assessed during the protocol development process to select the most appropriate baseline representation for the offset project. Rationale for the baseline scenario selected must be provided in the technical seed document, including details of assumptions and criteria required to establish and justify the approach to characterizing the baseline condition.

The following baseline types are acceptable for use in Alberta:

- Historic Benchmark: assumes that past trends at a given site will continue into the future. It is site-specific and constructed to reflect activities for a specified base period.
- Performance Standard: uses an assessment of comparable activities within a given industry or sector. It assumes that the typical emissions profile for an industry or sector is a reasonable approximation of the baseline scenario.
- Comparison Approach: uses actual measurements of parameters from a control group to compare with the project condition. Emissions or removals from the control group are monitored throughout the project and compared with the emissions from the project site. A control group may be used as the baseline for more than one project.
- Projection-Based: uses projections of reduction or sequestration in the future to estimate the baseline activity that would have occurred in the absence of the project. Projections may include straight-line growth assumptions or more complex modeling, and may be based on a set of constant parameters or be varied over time according to pre-defined procedures.

Baselines are further classified as static or dynamic:

- Static: the emissions profile for the baseline activity does not change during the offset crediting period. Both the input parameters for baseline calculations and the quantification methodology remain constant. If a static baseline is chosen the protocol should clearly define the temporal boundary for the baseline (e.g.. the year immediately preceding the project) and the protocol should indicate when the baseline should be recalculated (e.g. at the time of project extension); or
- Dynamic: the quantification methodology does not change over the offset project period, but the input parameters such as weather conditions, project operational parameters, etc. change over time. Dynamic baselines are recalculated annually (or when emission reduction or sequestration is quantified) to ensure the reduction or sequestration quantified represents real emission reductions or sequestration compared with the baseline condition.

### 5.2.1 Identification of Baseline Sources, Sinks and Reservoirs

An emission source is any process or activity that releases a greenhouse gas into the atmosphere. A sink is any process, activity, or mechanism that removes a greenhouse gas from the atmosphere. All applicable sources, sinks, and reservoirs including all energy and material flows for the project and baseline condition must be identified in the protocol development process. Following ISO 14064-2 guidance, sources, sinks, and reservoirs are then evaluated using a lifecycle analysis to identify and understand the relationship of the source/sink/reservoir to the proposed project activity and will further inform the baseline and project boundary conditions.

Identification and quantification of sources, sinks, and reservoirs forms the basis of the quantification protocol. Protocol developers must be able to support the decisions made to include and exclude sources/sinks/reservoirs and be able to justify all calculation methodologies applicable to the activity.

Sources, sinks and reservoirs are classified first as:

- Upstream: emissions associated with processes and products prior to occurring in the project boundary;
- On-site: emissions associated with processes and products within the project boundary; and
- Downstream: emissions associated with processes and products after the project boundary.

Sources, sinks, and reservoirs are then evaluated as:

- Controlled: this activity is under the direction and influence of the project developer through financial, policy, management or other instruments.
- Related: this activity has material and/or energy flows into, out of, or within a project, but not under the direct control of the project developer.
- Affected: this activity is influenced by the project activity through changes in market demand or supply of products or services associated with the project, but is not controlled by the project developer.

Sources, sinks, and reservoirs from the baseline and project condition must then be compared to assess changes related to the proposed greenhouse gas reduction activity.

- Included: sources, sinks, and reservoirs that are expected to change between the baseline and project condition are included in the quantification protocol and must be quantified. The change in greenhouse gas emissions resulting from these activities will form the basis of the protocol's emission reductions, and emission offsets calculations.
- Excluded: sources, sinks, and reservoirs that are unlikely to change between the baseline and project condition are excluded from the quantification methodology. Some sources, sinks, and reservoirs may be excluded to improve the conservativeness of the emission reduction calculations.

## 5.3 Project Condition

The project condition is a specific action or intervention targeted at reducing or sequestering greenhouse gas emissions and may consist of one or more inter-related activities developed according to a government approved protocol. The project condition may include modification of existing production, process, consumption, service, delivery or management systems, or introduction of new systems.

Emissions sources, sinks, and reservoirs that are included in the project condition must be real, quantifiable, and verifiable. Emission reduction or sequestration that cannot be quantified with a reasonable degree of accuracy will not be accepted in the Alberta emission offset system.

### 5.3.1 Identification of Project Sources, Sinks, and Reservoirs

Project condition sources, sinks, and reservoirs must be identified using the same methods, requirements and guidance outlined for identifying the baseline sources, sinks, and reservoirs.

### 5.3.2 Permanence

Temporal leakage refers to leakage from emission reduction or sequestration that does not result in permanent emission reduction or sequestration. These are often referred to as reversals or non-permanent emission reductions.

Reversals may be deliberate (e.g., early tree harvest, returning to conventional tillage on a field, release of carbon dioxide from a reservoir) or unintentional (e.g., insect infestations, forest fires, drought conditions, or release of carbon dioxide from well casing) reversals. Reversals will cause previously stored carbon to be re-emitted to the atmosphere.

The likelihood of reversal needs to be assessed during protocol development, and primarily discussed in the Technical Seed Document. The incidence of reversal must be assessed based on historical data and future projections using statistical methods with supporting information. The assessment should take into account regional variability across the sector to assign a coefficient based on the likelihood of reversal over a period of time appropriate to the activity. This provides an estimate of the number and magnitude of reversals that can reasonably be expected. For example, a process of discounting based on the likelihood of reversal can be applied to the calculated emission reductions based on the likelihood of reversal and using a percentage based multiplier. This process is known as applying a 'risk-based assurance factor' or 'discount factor'.

A risk-based assurance factor is applied as a coefficient modifier to emission reductions calculated during the project condition to discount all offsets generated by all projects. The use of a risk-based assurance factor/discount factor ensures that remaining emission offsets generated by the project are permanent. Alternatively some protocols may develop a risk-based insurance factor to address the risk of reversal.

If risk-based assurance or insurance factors are used in protocols they must be justified in the Technical Seed Document and presented in the protocol. Risk based assurance factors will be re-assessed during protocol review. The review will include an assessment of observed reversals and new science, technology or information to ensure that the factor remains valid.

## 5.4 Quantification

The quantification methodology lays out the equations used to quantify the emission offset. Emission offsets are quantified by subtracting project emissions from baseline emissions. All included sources, sinks, and reservoirs must be included in the equations. The equations are then laid out in a quantification table where the units, measurement and frequency for each included source and sink. If applicable, the quantification methodology must distinguish between levied and non-levied emissions and provide clear direction on how to report on the emission reductions from non-levied emissions. The methodology must ensure that emission reductions are expressed in tonnes of carbon dioxide equivalent and rounded down to the nearest tonne.

## 5.5 Documents and Records

The documents and records section must provide general information on the role and importance of documents and records and also specific information on the types of documents and records that will be required for a project to demonstrate they meet the offset system requirements and the requirements in the protocol. The protocol must be sufficiently detailed to ensure that prospective project developers are aware of the requirements for project documentation. The verification process relies heavily on the quality and availability of documentation. Therefore, the protocol must emphasize the types of documentation and records that are required to ensure a project is verifiable.

Alberta requires that third-party assurance providers verify to a reasonable level of assurance in accordance with the Standard for Validation, Verification, and Audit. In order to do this, the verifier/auditor must collect objective evidence during the verification/re-verification. The protocol must be developed and designed such that objective evidence can be collected by the third party assurance provider to prove an activity did or did not occur.

The types of documents and records required to demonstrate that an offset project meets program requirements will vary, but must be specified in the protocol. Documents and Records are required to be:

- Legible, identifiable, traceable;
- Centrally located;
- Dated;
- Easily located (easily searched);
- Orderly;
- Retained in accordance with the timeline requirements in the regulation; and
- Prevented from loss.

In the case of aggregated projects, the subproject and the aggregator must both retain records as required above. The protocol should emphasize that project developers are required to retain copies of all records that are needed to prove the reduction or sequestration. This includes retention of records when project ownership changes, and records to demonstrate the right to transact on emission offsets.

### 5.5.1 Documents

The documents section of a protocol outlines what documents must be available to demonstrate that an offset project meets the Alberta emission offset system requirements including requirements in the protocol, the Standard for Greenhouse Gas Emission Offset Project Developers, the Regulation and any other applicable offset system guidance. Documents are the instructions, plans, and procedures, guidance for how an offset project will achieve greenhouse gas emission reduction or sequestration. Examples of documents include: offset project plan, procedures, specifications, drawings, regulations, standards, guidelines, list of records etc.

### 5.5.2 Records

The records section of a protocol outlines what records must be available to demonstrate that an offset project meets the Alberta emission offset system requirements including requirements in the protocol, the Standard for Greenhouse Gas Emission Offset Project Developers, the Regulation and any other applicable offset system guidance. Records prove completion of the project as planned. Records include, but are not limited to, invoices, contracts, metered results, maintenance logs, calculations, databases, photographs, calibration records, etc.

Records must be retained according to the requirements outlined in Section 5.0 and as indicated in the offset project plan. In the case of an aggregated project, the individuals and the aggregator must both retain sufficient records to demonstrate that the offset criteria have been met. Records must be available and be disclosed to a third party assurance provider upon request.

The emission offset project developer is the person registered as the owner of the emission offset project on the Alberta Emission Offset Registry. Protocols must identify the documents and records a project developer must have to demonstrate entitlement to emission offsets, the right to transact emission offsets and the use of emission offsets for compliance. The protocol should, where possible, include a table that indicates which records are required for each criteria.

### 5.5.3 Quality Assurance / Quality Control

Protocols must indicate a list of quality assurance /quality control measures that will be applied to projects. These include, but are not limited to:

- Protecting monitoring equipment (sealed meters and data loggers);
- Ensuring that the changes to operational procedures continue to function as planned and achieve GHG reductions;
- Ensuring that the measurement and calculation system and greenhouse gas reduction reporting remains in place and accurate;
- Checking the validity of all data before it is processed, including emission factors, static factors and acquired data;
- Checking for anomalies and measures to deal with anomalous data;

- Performing recalculations of quantification procedures to reduce the possibility of mathematical errors;
- Storing the data in its raw form so it can be retrieved for verification;
- Protecting records of data and documentation;
- Recording and explaining any adjustment made to raw data in the associated report and files;
- A contingency plan for potential data loss;
- Instrument calibration performed regularly to ensure accuracy; and,
- Sampling protocols followed to ensure accuracy and consistency.

## 5.6 References

The protocol should list the references used in developing the protocol where applicable.

## 5.7 Special Considerations

### 5.7.1 Biogenic $CO_2$

Biogenic $CO_2$ is emitted during the storage, processing, and consumption of biologically based feedstock through combustion, digestion, fermentation or decomposition processes. When biomass is burned, decays, or is otherwise oxidized, chemical energy is released along with $CO_2$ back into the atmosphere. As part of the natural carbon cycle, this $CO_2$ can be taken up by growing plants and the energy is re-captured through photosynthesis. When the $CO_2$ released is completely balanced with removals by growing biomass it can be treated as being 'biogenic'.

Biogenic $CO_2$ can be considered to be carbon neutral but only if supporting records can show that there are no net changes in atmospheric carbon dioxide. This may include demonstration that the biomass is from waste or byproduct sources. $CO_2$ emissions must be quantified, but are excluded from project emissions and emission reductions calculations. Methane ($CH_4$) and nitrous oxide ($N_2O$) emissions must be quantified and included in project emissions and emission reductions calculations.

If you have any questions related to the content of this document please contact the Alberta Climate Change Office at:

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## Appendix A: Request to Develop a Protocol Template

## Appendix B: Request to Revise a Protocol Template