

Best Practice Guide: The Preparation for and Verification of Conservation Cropping Projects at Reasonable Level of Assurance

Prepared By:

KHK Consulting Ltd.

July 19, 2013 Version

Revised March 25, 2014

Acknowledgements

Initiated by Alberta Agriculture and Rural Development, funding for this Canada-Alberta cost-shared project was provided by Agriculture and Agri-Food Canada through the Agricultural Flexibility Fund, as part of Canada's Economic Action Plan.

The authors wish to thank Alastair Handley, Carbon Credit Solutions Inc, for his conception, review and coordination with the Carbon Offset Trading Association of Alberta, in the completion of this Guide.

Disclaimer

This document was prepared exclusively as information for Alberta Agriculture and Rural Development. The views and opinions expressed in this report are those of KHK Consulting Ltd. Inc. and not necessarily those of Agriculture and Agri-Food Canada or Alberta Agriculture and Rural Development, or Alberta Environment and Sustainable Resource Development.

The Government of Alberta, its officers, employees, agents and consultants make no warranty, representation, or otherwise, express or implied, in respect of this document or its contents. This document is not a government-approved best practice, but is intended as additional guidance for farmers, project developers, aggregators, and verifiers in using agricultural records to document practice changes that lower greenhouse gas emissions. This document is not a substitute for AESRD's Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance.

Table of Contents

1.0 Introduction	4
2.0 Agricultural Offsets and Conservation Cropping Offsets	5
3.0 Roles and Responsibilities.....	8
3.1 Overview	8
3.2 Roles and Responsibilities.....	11
3.3 Guidelines for Project Developers	12
3.4 Guidelines for Verifiers	16
4.0 Identifying and Mitigating Risks in Developing and Verifying Conservation Cropping Projects.....	19
4.1 Designing Controls	37
5.0 Sufficient and Appropriate Evidence for Conservation Cropping Projects.....	38
Appendix A – Evidence Matrix	40
References	48
Glossary.....	49

List of Tables

Table 1: Roles and responsibilities and minimum documentation requirement for each responsible party	11
Table 2: Risks, issues and recommendations associated with Conservation Cropping Offsets Claims	20
Table 3: General Hierarchy of Evidence.....	Error! Bookmark not defined.

List of Figures

Figure 1: Basic set of data requirements in order for a farmer’s field to qualify under the CCP	8
Figure 2: Process for creating, aggregating, verifying and registering agricultural offset credits as it relates to each responsible party	10

1.0 Introduction

Greenhouse gas (GHG) quantification and verification is a relatively new process compared to more established systems like financial auditing or environmental management systems auditing. Accreditation programs for GHG verifiers have emerged only in the last few years, and the requirements for verification are evolving in many GHG programs. Alberta has moved to a reasonable level of assurance for Offset Projects, as of January 1, 2012 and is updating protocols with more explicit guidance on the types and nature of evidence required to substantiate a claim to offset credits. The Conservation Cropping Protocol (CCP), an evolution of the previous Tillage System Management Protocol, is an example of the updated protocol format, with more explicit requirements for data, supporting documentation and records.

Given the current state of practice of GHG quantification and verification, and the ongoing evolution of the processes, procedures and requirements for such¹, the following needs for offset projects must be addressed in the short term:

- 1) Greater requirements for offset project's and project developer's data collection and management capabilities;
- 2) Quality control processes for data management systems and;
- 3) Supporting evidence used to compile the GHG claim – to enable the verifier to assess the completeness, accuracy, reliability, consistency, relevance, and transparency of the collected GHG data and information².

Further, verifiers will need to enhance their understanding of sufficient and appropriate evidence to support a GHG claim under the Conservation Cropping Protocol in order to produce more consistent verification outcomes.

The purpose of this Best Practice Guide is to provide responsible parties involved in creating compliance-quality Conservation Cropping Offset Credits (i.e. participating farmers, project developers and verifiers) with guidance on:

- GHG quantification considerations for agricultural offset projects/conservation cropping projects
- General risks and data-related risks in Conservation Cropping projects
- Data integrity and controls to manage risks in Conservation Cropping projects
- Sufficient and appropriate documentation and evidence for Conservation Cropping projects.

The expected outcomes for those following this Best Practice Guide are:

¹ Alberta has released a Technical Guide for Verification at Reasonable Level of Assurance, and is updating the GHG Offset Quantification Protocols to prepare the system for reasonable level of assurance. The Conservation Cropping Protocol is an evolution from the previous Tillage System Management Protocol.

² Alberta Environment and Sustainable Resource Development, 2013. Technical Guidance for GHG Verification at Reasonable Level of Assurance. <http://environment.gov.ab.ca/info/library/8802.pdf>

- **Project Developers** - greater consistency in approach to GHG data and information quality controls and records management to support increased intensity of testing under reasonable level of assurance; and,
- **Verifiers** - Clarity for verifiers on the requirements for verifying CCP offset projects leading to greater consistency in verification of CCP offset claims in the Alberta Offset System.

A companion document to this Best Practice Guide has been developed by Alberta Agriculture and Rural Development³. The *Offset Data Management Principles for Agriculture (DMP)* document provides the principles and framework behind data management systems and illustrations of its application in an agricultural context. The purpose of the DMP document is to provide a high-level, principles-based approach to data management for the **data manager**⁴.

The key questions proposed in the DMP document, and repeated here, can serve as a checklist for practitioners as they design and implement their data management systems for their CCP Projects.

- Is there a **line of sight** between all **measurement** points and reporting?
- Is the data management system and its **controls** well documented?
- Are there sufficient controls at key risk areas in the data management system?
- Have the controls been designed appropriately?
- Does the data management system generate high quality evidence?
- Does the data management system and the associated controls appropriately manage risk along each line of sight taking into consideration the relative effect of the data on the assertion?
- Does the data management system also address changes to **static data**?
- Is there adequate **separation of duties** between different participants in the data management system?

2.0 Agricultural Offsets and Conservation Cropping Offsets

There are unique aspects to agricultural offset projects that need to be considered when quantifying and verifying GHG offset claims. Some aspects of agricultural offsets are generated from sources that are typically not metered (i.e. mechanically measured). As a result, some of the parameters lack the associated certainty and reproducibility that well-calibrated mechanical systems can achieve. Their reliance on biological systems, with inherent complexity in measurement, and changing variables due to weather, disease, and diversity in cropping production systems, has resulted in the development of scientifically vetted and accepted estimation procedures, based on international and country relevant

³ Offset Data Management Principles for Agriculture, le-ef.com Consulting Corp., March 2014, 34 pp.

⁴ A data manager is any person that is involved in measurement, storage, manipulation, reporting, management, and control of data. A data manager can be a farmer that takes inventory of seed or head count of a shipment, a P.Ag. who reviews crop records or beef scale data, an aggregator that conducts calculations, the senior management that reviews the annual data, etc.

standards⁵, to manage complexity, cost and reproducibility. Uncertainty in agricultural protocols has been accounted for in the development of the quantification/estimation procedures and accepted by the regulator in Alberta.

In general terms, the approach to quantification in agricultural offset protocols is:

$$\text{GHG Emissions} = \text{Agricultural Activities} * \text{Emission Factor}$$

The emission factor approach derived through standardized measurement and modeling developed by the IPCC and further refined in Canada's National Emissions Inventory manages the risk of scientific uncertainty by accepting that measuring greenhouse gas emissions at farm operations is infeasible, and that standardized quantification within the protocol can be applied to farm data to conservatively estimate reductions between baseline and project condition. Thus, for agricultural projects, GHG data is a combination of farm activities/practices and in some cases performance data (yield of a crop, kg of beef production, etc.).

For Conservation Cropping projects, the GHG data are manually or electronically recorded information for the farm activities on each eligible field (Figure 1). For example, this data may include no-till implement spacing, seeded crop, seeded area, number of passes, irrigation water applied, etc. This information is used to apply the emission factor (no-till in either the Dry Prairie or Parkland) and run the equations outlined in the protocol to calculate the emission reductions. An example of a detailed field record sheet is provided in Appendix E of the Conservation Cropping protocol showing the type of information/data that needs to be collected.

The GHG data used in the calculations needs to be substantiated by evidence – a combination of farm records, third party records and physical evidence gathered by the project developer to support the GHG claim. The Conservation Cropping Protocol provides specific requirements and additional guidance on the types of records and evidence that need to be collected to substantiate that the GHG data underlying the claim is accurate (Section 5.0 of the protocol).

At a reasonable level of assurance, project developers applying the Conservation Cropping Protocol will be exposed to rigorous testing by verifiers on the following processes:

- The control environment - defined as the overall system of internal checks by project developers to ensure all claims are accurate and fully supportable by records;
- Due diligence on farm/field eligibility – defined as consistent and transparent procedures on the acceptance of farms/fields into the offset project; and,
- Data and record collection and management systems – defined as the framework developed for collecting, storing and retrieving field specific records and calculations that support the claims made (Please see the Government of Alberta's "Technical Guidance for Greenhouse Gas Verification at Reasonable Level Assurance" for additional information)⁶.

⁵ Intergovernmental Panel on Climate Change Guidance and Canada's National Emissions Inventory Report quantification methodologies.

⁶ <http://environment.gov.ab.ca/info/library/8802.pdf>

Project developers will be expected to establish, document and implement a quality assurance/quality control system to ensure that data integrity is maintained throughout the project and sufficient and appropriate records/evidence are documented to support the existence and accuracy of all eligible offset credit claims under the Conservation Cropping Protocol. Further, under a reasonable level of assurance, it is expected that the extent and nature of records collected to substantiate the GHG claim will increase. More guidance is offered in the next few sections.

At a high level, in order for a field to be eligible in a Conservation Cropping Project, each field must meet a minimum set of requirements (Figure 1) as defined in Section 5 of the Conservation Cropping Protocol. These requirements can be used as part of a project developer's due diligence to screen eligibility of a farm field to participate in the offset project.

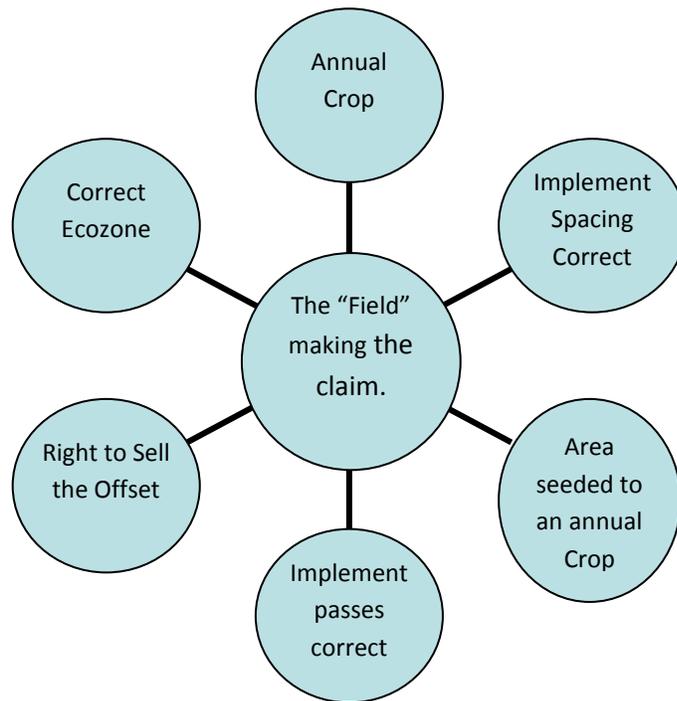


Figure 1: Basic set of data requirements in order for a farmer’s field to qualify under the CCP (See Table 2 for more detailed information)

3.0 Roles and Responsibilities

3.1 Overview

Several responsible parties are involved in the creation of Conservation Cropping offsets (Figure 2). The process for developing, verifying and registering Conservation Cropping offsets is as follows:

Undertake Eligible Farming Activities

- Farming activity is undertaken by a farmer which meets the eligible farming practices as defined by the Conservation Cropping Protocol. Eligible farming practices include carrying out farming activities that meet no-till practices as defined by the protocol.

Gathering Data

- The project developer or their representative confirms with the farmer that the farmer has implemented no-till farming practices.
- The project developer contracts with the farmer (who has a contract with the landowner if they are not the landowner themselves) - who has implemented eligible farming practices – to: 1) buy the rights to the emission reductions; or 2) act as an agent to sell the emission reductions on behalf of the farmer.
- The project developer or their representative (i.e. in-house staff or contractors, herein collectively called the ‘project developer’ since the representative is acting on the project developer’s behalf) gathers the relevant information to ensure that the farmer has detailed farm records to support the eligible farming practices. In addition, the project developer must inspect no-till farming equipment for tillage offsets. Standard practice is to take a time stamped photo of the equipment showing the opener width and distance between shanks.
- The project developer gathers supporting documentation for ownership (land title certificate), and farming practices (e.g. crop insurance, or farm records). Supporting documentation for no-till equipment will also be gathered (e.g. purchase receipts or lease agreement, date stamped photos as above) in addition to the records for field specific activities mentioned above (e.g. crop insurance, farm records – see Appendix A).
- The project developer reviews all of the supporting documentation for each individual offset claim to ensure it is eligible to be verified and registered as an offset credit in the Alberta Offset System. *Note: Claims that are ineligible due to a lack of supporting documentation must be excluded from the total offsets included in the project report.*
- The project developer enters the eligible offset credits into a data management system, quantifies the total offset credits and compiles an offset project plan and report.
- The project developer engages an independent third party qualified to perform verification in the Alberta Offset System. *Note: Minimum requirements for verification qualifications are specified in the Specified Gas Emitters Regulation (SGER).*

Verification

- The verifier performs procedures over the offset project report at a reasonable level of assurance.
- The verifier will request project data to develop a Verification Plan.
- The Verifier may conduct site visits to farms enrolled in the project to assess data collection procedures and develop a general understanding of the project developer’s controls over field eligibility.
- The verifier will conduct verification procedures to confirm the evidence is sufficient and appropriate to support the GHG Assertion at a reasonable level of assurance.
- The verifier will complete a Verification Statement and Verification Report that describes the verification findings.

Registration

- The project developer registers the verified offset credits with AESRD.

Responsible Party	AESRD	Feedlot Operator/ Landowner	Project Developer	Verifier	Professional Agrologist*
Activity	Approve protocol	Qualifying agricultural livestock activities	Registration of verified offsets		Provide technical services
		Maintain records to substantiate activities	Confirm eligibility of farming practices		Sign-off on eligible field data and practices
		Contract with Project Developer	Contract with farmer and landowner		Maintain farmer records supporting sign-off
			Conduct farm visit		
			Gather supporting documentation		
			Develop project plan and compile report	Verification offset credits	
	Serialization of offset credit				

* Where applicable

Figure 2: Process for creating, aggregating, verifying and registering agricultural offset credits as it relates to each responsible party

3.2 Roles and Responsibilities

In the agricultural offset credit system, responsible parties are involved in the development and verification of a credible GHG Offset Claim - AESRD, farmers, landowners, project developers, professional agrologists and verifiers. The respective roles and responsibilities of each party are described below in Table 1. In some instances the farmer and the landowner may be the same individual. In some cases, a professional agrologist may be involved, in other cases not.

Table 1: Roles and responsibilities and minimum documentation requirement for each responsible party

Responsible Party	Roles and Responsibilities	Minimum Documentation Requirements ⁷
AESRD	<ul style="list-style-type: none"> • Approved protocols in place that identify the methodology for calculating offsets • Approved verification methodology in place • Due diligence processes in place for assessing and accepting verified offset project reports 	<ul style="list-style-type: none"> • Approved Protocols and related verification guidance
Farmer ⁸	<ul style="list-style-type: none"> • Farming practices performed in accordance with protocol requirements 	<ul style="list-style-type: none"> • Detailed farm records (see Appendix A)
Landowner	<ul style="list-style-type: none"> • Has the right to sell offset credits 	<ul style="list-style-type: none"> • Signed offset credit agreement between farmer (if landowner not the farmer)
Project developer*	<ul style="list-style-type: none"> • Agreement to sell offsets on behalf of Landowner • Knowledge of farming practices • Inspection of farm records and other supporting documentation • Inspection of supporting documentation to confirm that the farming practices that occurred and the records of these practices meet the protocol requirements • Calculate offset claims accurately • Establish a strong control environment • Maintain sufficient evidence to support claim 	<ul style="list-style-type: none"> • Signed offset credit agreement • Land title certificate • Data collection records (may be used as a control at the discretion of the project developer) • Detailed listing of farming practices for each field included in offset claim by year • Process documentation relating to data management and record keeping for offset credits
Professional agrologist (if used)**	<ul style="list-style-type: none"> • May be used to provide technical services on project development or as a secondary source of corroborating evidence of eligible farm practices 	<ul style="list-style-type: none"> • Signed-off statement regarding their opinion on eligible field data and practices (see Appendix A).

⁷ Protocol specific minimum documentation requirements are detailed in Section 5 for each Protocol.

⁸ Could be a landowner or could be a lessee/tenant

	<ul style="list-style-type: none"> • Can work for farmer or project developer (if providing technical services) • If secondary source of corroborating evidence, they must sign-off on their opinion. 	<ul style="list-style-type: none"> • Records from farmer supporting the opinion, collected and maintained to support the professional opinion
Verifier	<ul style="list-style-type: none"> • Determine whether the overall emission reduction is fairly stated (reasonable assurance) • Team will consist of key agents as identified in AESRD Guide to Verification • Subject matter expert part of team with knowledge of cropping systems in Alberta 	<ul style="list-style-type: none"> • All supporting documentation that is assigned to the project developer, landowner and farmer may be requested throughout the assurance engagement to provide support for the agricultural offset credit claim.

*Project Developer and their representatives

**The role of the professional agrologist is being developed under a Practice Standard by the Alberta Institute of Agrologists. See Appendix A for more information on the role of a P.Ag. during this transitory time.

Further information on the specific roles and responsibilities of Project Developers and Verifiers are provided in the form of guidelines below.

3.3 Guidelines for Project Developers

The information below documents your roles and responsibilities in relation to gathering and managing Conservation Cropping offset records and preparing the offset credit claim.

What is your role?

As a Project Developer you are responsible for interacting with farms in order to gain an understanding of the eligibility of the farming activities that took place on the fields that are being submitted for an offset claim. You are also responsible for ensuring the equipment that has been used on the fields that are being submitted for an offset claim fit the protocol requirements. Best practice is to visit the farms and inspect equipment, as well as, gain an understanding of all relevant farm records that will become part of the offset claim.

Furthermore, you are responsible for the following:

- Entering into offset credit agreements with the farmer;
- Ensuring that the farming activities and supporting records meet the protocol requirements for each individual offset claim included in your project report; and,
- Ensuring the accuracy of the offset claim and supporting data.

What to expect?

- You will need to establish contact with a farmer and confirm the eligibility of the farm for an offset credit under the protocol (Refer to Appendix A for eligibility criteria and supporting records). You will explain the terms of your offset credit agreement, including the need to establish a contract with the landowner, if the farmer is not the landowner.
- You will need to gather supporting documentation for ownership and legal land location (e.g. land title certificates; confirmation of land ownership for renewed fields in the project; lease agreements), farming practices (e.g. crop insurance and farm records) and equipment (e.g. purchase receipts or custom seed agreement and date-stamped photo of the opener width and shank spacing of the direct seeding equipment).
- Where applicable, you will be responsible for ensuring that your representative has sufficient knowledge and expertise to carry out their roles and responsibilities.⁹
- You will need to collect the completed farm records that relate to all individual offset claims included in your project report (see Appendix A for a listing of appropriate supporting records).
- You will need to implement a system of checks to ensure the evidence that has been collected is sufficient and appropriate to support the claim..
- You will need to review all of evidence for each individual offset claim to ensure it is eligible to be verified and registered as an offset credit in the Alberta Offset System. *Note: Fields or farms that are ineligible due to a lack of supporting documentation must be excluded from the total offsets included in your project report.*
- You will need to maintain a data management system that contains all of the supporting documentation for all the offset credits included in your project report.
- You will need to quantify the total offset credits and compile an offset project plan and report.
- You will need to engage an independent third party qualified to perform verification in the Alberta Offset System. *Note: Minimum requirements for verification qualifications are outlined in the Specified Gas Emitters Regulation and a Technical Guidance Document to Verification found at <http://environment.alberta.ca/02275.html>.*
- You will need to register the verified offset credits with the Alberta Emissions Offset Registry at <http://carbonoffsetsolutions.climatechangecentral.com/offset-registry>.
- You will need to establish, document and implement a quality assurance/ quality control system to ensure that data integrity is maintained throughout the project and to support the existence and accuracy of all eligible offset credit claims.

⁹ The Project Developer should have written procedures for the inspection requirements as part of their process documentation. This is necessary to avoid mis-interpretation and inconsistencies between farm visits. For example, equipment measurements for protocol soil disturbance requirements involve physically measuring opener width and shank spacing. Farmers and equipment manufacturers will routinely cite 4" or 5" openers, but measurements reveal the width is actually 4.5" and 5.5", respectively.

How detailed do farm records need to be?

Farm records should clearly describe all relevant information. For Conservation Cropping offsets, records of field activities should identify the field and each of the activities carried out on a field to ensure the field's eligibility in the project (e.g. type of crop seeded, seeded acres, types of fertilizer applications, all tillage events, reseeding events, water usage, etc. – see Appendix A), the timing of the activities and the type of equipment used in each case.

Farm records should be supported by relevant additional records, such as crop insurance, equipment rental or purchase receipts, equipment measurements (and associated time stamped photographic evidence of the measurements). The farm records reviewed need to include at minimum the records specified in Section 5 of the Conservation Cropping Protocol (further guidance is given in Appendix A of this document).

How long do all supporting documents need to be retained?

AESRD requires that all documents relating to all verified offset credits that have been registered in the Alberta offset system must be retained for 7 years after the project crediting period.

What is a data management system?

The system used by the project developer to collect and manage the data. You will need to establish and document data management and record keeping procedures, identifying key controls over the records associated with the offset credits, to mitigate the key risks relevant to the agricultural protocol. For a simple project with limited data, this may be as simple as a brief description of the controls, a spreadsheet and paper files for the collected records. For more complex projects with a large amount of data, the data management system may be comprised of a well-documented description of the system and controls, including a custom built database with electronic copies of farm records.

In order to support third party verification, you must put in place data management and record keeping procedures that at minimum meet the following requirements:

- All records must be kept in areas that are easily located;
- All records must be legible, dated and revised as needed;
- All records must be maintained in an orderly manner;
- All documents must be retained for 7 years after the project crediting period, including raw data for the project (Required by AESRD);
- Electronic and paper documentation are both satisfactory; and,
- Copies of records should be stored in two locations and backed up regularly to prevent loss of data.

What is your role in ensuring data quality?

In order to ensure that the underlying data supports the Conservation Cropping offset claim, you must create a strong control environment to mitigate the risks associated with the offset claims. A strong control environment will ensure the existence and accuracy of all eligible offset credit claims. In designing the controls to be put in place, you should ensure that there is segregation of duties between the individual responsible for collecting and processing offset credit agreements and supporting data and the individual approving offset credit agreements and reviewing offset credit files for completeness of information. Recommended controls include, but are not limited to:

- Management review and approval of offset credit agreements;
- Management review of your representative's performance and records to determine consistency with your (project developer's) guidelines for undertaking farm data collection and due diligence;
- Management review of offset credit files for completeness of information prior to processing, particularly in relation to the quality of records supporting assertions;
- Management review of data entered into the database against farm records collected.
- Exception reports to identify duplicate records, incorrect ecozone classification, incorrect emission factors, data outside of expected range (e.g. in relation to field size, opener spacing) etc.;
- Restricted user access to offset claim calculations;
- Maintaining a record of all changes to data and calculations in the database; and
- Management review of reported data to ensure it is consistent with underlying offset credit data.

What is your role during verification?

As project developer your initial role is to hire a verifier that has the breadth and depth of experience required to evaluate agricultural projects. To support a successful verification, it's your responsibility to ensure you have gathered sufficient and appropriate evidence so that the verifier can make a meaningful assessment of disturbance activities that are non-assertion based (See Appendix A for examples of evidence)¹⁰.

During the verification, you will be required to provide the verifiers with documentation describing your data management system, your project plan and project report and information supporting your offset claim. The verifiers will examine your project report; supporting records and data; and select a sample of the data to confirm claim-related information. Based on the sample selected, best practice is for the verifier to visit individual farms and interview farmers or landowners. As project developer, you will be asked to facilitate the verification process by making any necessary contacts with the farmers and/or

¹⁰ Note - A robust due diligence system which includes detailed field record sheets, backed by evidence of field passes such as: time and GPS stamped pictures of fields or GPS track files from equipment or other evidence that is non-assertion based. This means that under reasonable level of assurance, verifiers and auditors can sample these records and gain confidence that the field record's reported number of passes and disturbance events are correct, and reach an opinion on the materiality of the project at any time after the project is completed.

landowners. You may also be asked questions related to your knowledge of the farms and your data collection and quality control processes.

The overall cost efficiency of the verification process is significantly impacted by the extent of due diligence procedures implemented by the project developer, particularly in relation to due diligence over the types of activities carried out on individual fields. Where a broad set of due diligence procedures have been established, and the implementation and effectiveness of these procedures can be tested by the verifier, the amount of time required for the verification will be substantially reduced.

3.4 Guidelines for Verifiers

The process of verification is to independently provide an opinion on whether the GHG assertion is fairly stated in all material respects. Alberta Environment and Sustainable Resource Development (AESRD) have published a Technical Guide for Verification at Reasonable Level of Assurance¹¹. The AESRD Technical Guide is the primary resource for verifiers who are providing assurance services in the Alberta Offset System. For completeness sake, this section for Verifiers is included in this Best Practice Guide.

What is your Role as a Verifier?

As a verifier, your role is to answer three basic questions:

- 1) Has the project been implemented in accordance with the requirements of the Offset System Quantification Protocol, AESRD Guidance Documents, Specified Gas Emitters Regulation and Legislation as amended?
- 2) Are the asserted greenhouse gas reductions over the reporting period fairly stated in all material respects?
- 3) Does the project satisfy the eligibility criteria outlined in the Program Rules and Guidance for Project Developers?

¹¹ <http://environment.gov.ab.ca/info/library/8802.pdf>

What to expect?

- You and your firm will have expertise in the ISO 14064-3 verification standard and any other additional standards your profession requires. You will be qualified to perform verifications under the Specified Gas Emitter's Regulation.¹².
- You have assembled a competent team to conduct the verification that may comprise:
 - A designated signing authority;
 - A lead verifier;
 - A peer reviewer; and
 - Technical subject matter experts.
- Your technical subject matter experts have an understanding of the operations and processes related to Alberta cropping systems as well as an understanding of the effect of management/technologies used in these systems on greenhouse gas sources and sinks.
- Your firm has conducted an evaluation of independence, and is arms length and impartial in your role as an assurance provider to the project developer and farmers. A conflict of interest statement has been completed and submitted.
- You and your team have conducted an initial assessment of the project's subject matter (project greenhouse gas, production and performance data) as well as project developer's data management system and the extent of substantiating evidence and records to support the project and deemed it as appropriate to proceed with the assurance engagement.
- You and your team will have designed verification procedures for the project's GHG assertion based on an initial planning exercise where you and your team go through a series of inquiries, observations and inspections of the project's operations, management practices, GHG data, data management system, records and controls to determine inherent, control, and detection risk in the GHG assertion.
- Based on the risk assessment above, you will have developed a verification plan with associated verification procedures that will drive the data and evidence collection for the assurance engagement. A summary verification plan is shared with the Project Developer so they know what to expect. However, this plan does not require detail on specific samples as this could undermine the effectiveness of the tests conducted during verification if the project developer has the opportunity to treat the samples differently. The plan has a balance between controls reliance and substantive testing.
- You will need to develop a sampling plan, using structured types of sampling procedures, based on the nature of the evidence type and analysis being done.

¹² Eligible persons qualified to perform third party audits under Section 18 of the Specified Gas Emitter's Regulation are either a CA or P.Eng., or member of a profession that has substantially similar competence and practice requirements as chartered accountants or professional engineers.; see <http://www.canlii.org/en/ab/laws/regu/alta-reg-139-2007/latest/alta-reg-139-2007.html#history>.

- You and your team will need to understand the nature of the evidence being gathered and what constitutes sufficient and appropriate evidence against a GHG data point in the protocol.
- You will need to let the project developer know when you will be coming to their offices to execute the verification, ensuring both you and your team, as well as the project developer have sufficient staff and resources available to you.
- You and your firm will need to have a documented quality management system (QMS) in place including the following:
 - A quality manual demonstrating compliance to ISO 14064-3 standard and other standards as required by your profession, as applicable to verification activities; and documented procedures for implementing the QMS;
 - Record control procedures;
 - Independence procedures;
 - Preventative action procedures (potential non-compliance activities)
 - Corrective action procedures (non-compliance activities)
- You and your team are aware of the mandatory procedures required by AESRD in the Verification Guidance Document (Section 4.1.4.2 for Offset Projects) and have incorporated them into your Verification Plan.
- You will come to a conclusion regarding the material correctness of the GHG assertion- following the materiality assessment guidance in the AESRD's Verification Guide, compile that into a Verification Statement and Report, and submit to the Project Developer.

Will I have to make site visits to the individual farms or operations?

You will need to visit the Project Developer's offices for physical inspections. Farm visits must be conducted in accordance with the CCP and the Verification Guidance Document. The sampling of farm visits can be done on a risk basis. This procedure needs to be written up in the verification plan and verification report.

What if I think there are fraudulent activities going on regarding a GHG Assertion and Project by the Project Developer?

You are best advised to cease the verification, and seek legal counsel regarding the nature of the fraud. Depending on the legal counsel, you and your firm will need to decide whether to withdraw from the verification, or continue with the verification and notify AESRD of the situation.

According to AESRD's Verification Guidance Document - you are responsible to notify the Project Developer's senior management of the issues and intended course of action.

4.0 Identifying and Mitigating Risks in Developing and Verifying Conservation Cropping Projects

Identifying risks is the first step in designing risk assessment procedures and control measures to manage the risk of a misstatement of a GHG Offset claim. By documenting the risks, project developers can also help the verifier better understand the verification strategy needed to successfully verify Conservation Cropping Projects (CCPs). By understanding the risks, verifiers can design applicable verification procedures to assess whether the GHG Assertion is fairly stated in all material respects.

Conservation Cropping projects typically have a higher degree of inherent risk because of:

- Reliance on manually recorded data at the farm level, with associated risks that data/records could be missing or inaccurate due to human error;
- Difficulty in assessing the accuracy of farm data as the practices undertaken may no longer be examinable;
- Risk of farmer misinterpretation on type and frequency of the data collection required;
- The aggregation of multiple agricultural operations together. This poses risks related to inconsistency of data collected and record keeping procedures by the farmer.

To help guide project developers and verifiers in understanding risks in agricultural offset projects in general, and the CCPs in particular, a risk matrix with recommended procedures for verifiers has been developed. Table 2 provides guidance on potential data, records issues and verification recommendations for conservation cropping offsets and the evidence required to support the GHG claim.

Table 2: Risks, issues and recommendations associated with Conservation Cropping Offsets Claims (Please Note: The following table was adapted from KPMG’s Mock Verification Report, completed as part of the Protocol Validation studies, 2013)

1. Ownership of the farm field	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Has the land title certificate been provided for each field being claimed in the project for the first year that the field is included?</p> <p>AND</p> <p>Has there been an annual check against the land titles to determine if ownership for the property has changed?</p> <p>If the ownership has changed, has a new land title certificate been obtained and the associated land owner/tenant agreements updated?</p>	<p>Limited – land title certificates and changes to these are readily available.</p>	<p>Limited – primary concern is the length of time between the most recent land title check by the project developer and the verification. The longer the length of time, the greater the likelihood that some land titles may have changed.</p>	<p>As this is an eligibility criterion significant sampling is expected for this criterion.</p> <p>Ownership information from the land title will need to be cross checked against the signatories on the contract with the project developer.</p>

2. Right to transact on offset credits	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Is there a contract between the project developer and the farm operator for the assignment of the carbon rights? This must include an agreement to provide access to data needed to quantify the greenhouse gas assertion for the farm enterprise.</p> <p>AND, in the case of rented or crop-shared land:</p> <p>Is there a signed written lease agreement between land owner(s) and the tenant that clearly states the assignment of the rights to the carbon? The contract must be in place before the farm field can be registered in an offset project.</p>	<p>Primary risks are:</p> <ul style="list-style-type: none"> • A landowner or operator claiming credits on land they did not farm. • If the landowner is more than one person or a legal entity, ensuring that all required signatories have signed the agreement. • The existence of agreements which the farmer either no longer recognizes or disputes 	<p>Limited – field samples of farming practices will also identify cases where the landowner of farmer does not recognize the agreement and where the landowner has not disclosed a leasing arrangement.</p>	<p>Additional items that the contract could beneficially address include:</p> <ul style="list-style-type: none"> • The requirement to disclose prior disqualification by another project developer • An assertion that the offset credits have not been sold to any other project developer or on any other registry.

3. Seeded acres, field size and location being claimed	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Has the project developer provided one of the following?</p> <p>A GPS track file from farm seeding equipment for each year,</p> <p>OR</p> <p>A GPS shape file derived from field inspection, showing deductions for non-cropped areas (e.g. roads, gullies, wooded areas, grassed waterways, farm buildings).</p> <p>OR</p> <p>Measurement of field size using Google Earth, air photos or satellite data showing deductions for non-cropped areas (e.g. roads, gullies, wooded areas, grassed waterways, farm buildings, etc)</p>	<p>Primary risk is failure to correctly determine areas of a field that were cropped.</p> <p>Generally, the data disclosed in crop insurance information is not developed to the materiality level required by AESRD and therefore crop insurance records should NOT be used as a source of cropped area¹³.</p> <p>Calculations of cropped area may not be transparent and the process for calculating cropped area is not documented in the process documentation.</p>	<p>Non-cropped areas – the project developer should have a documented process for identifying areas in a field that are to be excluded. Permanent features and buildings are straightforward, however, there can be ephemeral features like wet depressions (potholes) or temporary wetlands that can vary from year to year, causing a fluctuation. This requires a measurement of cropped acres every year.</p> <p>The estimate of cropped area must exclude areas that are not in the property, such as road allowances and ditches.</p>	<p>Particular attention should be paid to the calculation of croppable area each year to ensure that the process is conservative in its approach.</p> <p>Crop insurance is used to confirm that an annual crop was seeded on the field in question. It is not sufficient or appropriate evidence to determine the number of actual seeded acres for that field. The seeded area is deemed to be the arable area of the field, confirmed by the 3 evidence options listed in column 1, and informed by further information listed in Appendix A.</p>

¹³ But, if a claim is made, the fields will be GPS'd (see Appendix A)

4. Ecozone protocol area classification	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Does the location of the project field compare to the classification boundary layer file available at http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/cl11708</p>	<p>Limited- data is readily available.</p>	<p>Limited –focus of testing should be on fields claimed as parkland.</p>	<p>The most effective approach to this test would usually be to assess the project developer’s controls over the query and the subsequent controls over changes to database entries.</p>

5. Existence of an annual crop, or first year of seeding of a perennial crop	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Is at least one of the following list of detailed farm records (completed by the farm operator) available, specifying the crop during the project year:</p> <ul style="list-style-type: none"> <i>a)</i> Detailed farm record sheets (see example in Appendix E), <i>b)</i> Crop plan, such as one provided to seed/fertilizer dealers to ensure product is available for spring farming operations, <p>AND one of the following:</p> <ul style="list-style-type: none"> <i>i.</i> Crop insurance records, or <i>ii.</i> Photo of annual crop with time and date stamp and link to location of field making the claim (e.g. reference point in photo, GPS file), or <i>iii.</i> Supporting records to verify the accuracy of the items above. This may include sign off by a professional agrologist¹⁴ who has reviewed and collected supporting farm records that confirm the types of crops/field activities for that year.¹⁵ 	<p>Moderate – the primary area of concern is the minimum specifications for farm records or crop plans. The protocol provides an example but is not prescriptive. Individual farms may have widely varying qualities and quantities of records. Further, in some cases the “farm records” may be the same document as the project developer’s data collection sheet.</p> <p>Supporting documentation is normally crop insurance records which are a relatively straight forward form of evidence.</p> <p>For farms without crop insurance please see Appendix A.</p> <p>Use of an assertion by a professional agrologist to support this criterion is subject to the issues raised in the footnote below. Note: to make an assertion, the professional agrologist must be able to</p>	<p>Location of records – the project developer should have all necessary records available for inspection. If key records are only available for inspection at the farm level this creates both a non-compliance with the record keeping requirements of the protocol and a significant challenge for verifiers in accessing evidence.</p> <p>Quality of records – The protocol provides examples of, but does not define minimum quality requirements for farm records or crop plans. As a result, different project developers may set significantly different minimum record requirements for their participating farmers.</p> <p>Alternatives to crop insurance records – alternative options to crop insurance exist under the protocol but are less straightforward to assess, take more verification time and have a higher risk of failing a “sufficient and appropriate” evidence</p>	<p>Where the project developer does not have ready access to the relevant records, curtailment of the verification until such time as the project developer has the appropriate records is an appropriate response.</p> <p>Prior to initiating assessments of farm records, it is critical to assess the project developer’s standards for minimum farm records (which should be documented) and determine whether these are adequate to produce a consistent result that meets the requirements of the protocol.</p> <p>Segregation of samples based on the presence / absence of crop insurance and treatment of the sub-population without crop insurance as a higher risk sub-population for sampling purposes is recommended.</p> <p>Where assertions by professional agrologists are expected to be a significant source of corroborating verification evidence it is critical</p>

¹⁴ A conservative approach is to recognize only P.Ag. designations as this meets all elements of the protocol. The project developer and verifier can confirm with the Alberta Institute of Agrologists the status of the P.Ag. (see table comments). Professional agrologists are legally able to provide professional sign off in the province of Alberta. Any recognition of individuals other than those with P.Ag. designations poses a risk under the protocol.

¹⁵ The Alberta Institute of Agrologists is currently developing a Practice Standard for use with cropping protocols.

<p>Have these records been identified in the report and maintained in a format that is readily available for verifiers to inspect?</p>	<p>demonstrate that they have copies of the necessary farm records to confirm the assertion is correct.</p>	<p>test.</p> <p>Assertions by professional agrologists – project developers may interpret the protocol to allow for any paid agrologist to sign off as a professional agrologist on farm information. Additionally, project developers may not have undertaken the due diligence to establish whether the agrologist has maintained their own records to confirm their assertion is correct. In order to meet these requirements, professional agrologists would need to maintain their own record management system.</p>	<p>to establish at the outset of the verification how the project developer has interpreted the term “professional agrologist”.</p> <p>The verifier can perform their own due diligence by calling the Alberta Institute of Agrologists (AIA) and asking the following questions about the P.Ag. who signed off:</p> <ul style="list-style-type: none"> • Is he/she a member in good standing with the AIA? • Has he/she self-declared practicing in this area? <p>When sampling fields relying on assertions by professional agrologists a sub-sample of the assertions should be examined to determine whether the signing agrologist has maintained their own records to confirm their assertion is correct.</p>
--	---	---	---

6. Occurrences of soil disturbance on each farm field being claimed	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Has the project proponent provided detailed farm record sheets (see example in Appendix E of the protocol) that specify all land disturbance activities including but not limited to seeding, manure spreading/incorporation and discretionary tillage?</p> <p>Has there been disclosure of any discretionary tillage events on a field, and calculation of area affected by the disturbance confirmed by a farm record sheet (see example in Appendix E of the protocol) or GPS readings from farm equipment?</p> <p>If no discretionary tillage is done on a farm field, this must be documented in the farm record sheet.</p> <p>AND has at least one of the following been provided?</p> <p><i>a)</i> The specific equipment used, or <i>b)</i> Supporting records to verify the accuracy of the items above. This may include sign off by a professional agrologist who has</p>	<p>Significant – the primary area of concerns are the minimum specifications for farm records and the fact that the greatest risk is of undocumented activities. The protocol provides an example but is not prescriptive. Individual farms may have widely varying qualities and quantities of records. Further, in some cases the “farm records” may be the same document as the project developer’s data collection sheet.</p> <p>Supporting documentation may or may not include sign-off by a professional agrologist. Where this is not the case, the nature of documentation will (again) vary widely. This is of particular concern where the project developer has not documented, as part of their own due diligence process, how or why the supporting documentation supports the claim.</p> <p>The protocol is worded in such a way that the specific equipment used on each field does not necessarily have to be recorded (although this is in direct contradiction to the example farm record sheet).</p>	<p>Location of records – same as #5.</p> <p>Quality of records – The protocol provides examples of, but does not define minimum quality requirements for farm records. As well, the nature of the verification is such that the primary risk is of unrecorded activities rather than recorded ineligible activities. As a result, the primary test for farm records is one of completeness, which is hard to establish.</p> <p>Specific equipment used – some farms may not have recorded on a field by field basis which equipment was used for what due to the wording of the protocol.</p> <p>Specific equipment used – larger farms will likely have many pieces of equipment, some of which would lead to fields being eligible, some of which would lead to fields being ineligible. After the fact, it may be hard to determine which equipment was used. The risk is particularly high where farms have multiple pieces of ineligible equipment in good repair but make no-till claims for all / substantially all of their fields.</p> <p>Assertions by professional agrologists – same</p>	<p>Prior to initiating assessments of farm records, it is critical to assess the project developer’s standards for minimum farm records (which should be documented) and determine whether these are adequate to produce a consistent result that meets the requirements of the protocol. In particular, records must be field specific and be of sufficient detail to identify the full series of activities on the field over the crop year. Because the primary test for farm records is one of completeness it is recommended that the following types of verification activities be considered:</p> <ul style="list-style-type: none"> • Reasonableness checks of farm records by cross-referencing the information to other farm data (fertilizer purchases, additional seed purchases etc.) • Field inspection at critical points in the crop year to provide direct observation of the presence /absence of ineligible practices. • Use of ground-truthed satellite data, where available • Reconciliation against machine specific GPS data where available. • Reliance on date and location stamped photographic evidence of

<p>reviewed and collected supporting farm records that confirm the types of equipment used to meet protocol requirements (e.g. number of passes, shank spacing and opener width) and disturbances per field. These records must be identified in the report and maintained in a format that is readily available for verifiers to inspect.</p> <p>Failure to disclose discretionary tillage will result in the field being disqualified for the claim year.</p>	<p>Use of an assertion by a professional agrologist – same as #5.</p>	<p>as #5.</p>	<p>field activities¹⁶.</p> <p>In order to provide reasonable assurance it is recommended that the evidence requirement to support farm record sheets be changed from “at least... a) or b)” and replaced with “a) and b)”.</p> <p>As part of site visits, where it is evident that a farm has both eligible and ineligible equipment in current use (i.e. good repair) and make no-till claims for all / substantially all of their fields the verifier should gain an understanding of where the ineligible equipment is being used and under what circumstances in assessing the overall reasonableness of the claim.</p>
---	---	---------------	--

¹⁶ Note - A robust due diligence system which includes detailed field record sheets, backed by evidence of field passes such as time and GPS stamped pictures of fields or GPS track files from equipment, means that under reasonable level of assurance, verifiers can sample these records and gain confidence that the field record’s reported number of passes and disturbance events are correct, and verifiers do not need to be engaged at the beginning of the growing season.

7. Seeding/fertilizer specifications used each year	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Has the project developer provided a calculation of the percentage of soil disturbance based on the width of the opener and shank spacing AND one of the following?</p> <ul style="list-style-type: none"> <i>i.</i> Photo evidence with time stamp of equipment used including: <ul style="list-style-type: none"> <i>a)</i> Opener width, <i>b)</i> Distance between shanks <i>ii.</i> Supporting documentation for equipment used by the farm operator including equipment receipt or rental agreement, model number of the tillage equipment. Changes in equipment need to be documented and recorded in the project developer's files. Equipment purchase and sale records or rental records shall be maintained for verification purposes, or <i>iii.</i> Signed-off report completed by a professional agrologist who has reviewed and collected supporting farm records that confirm the type of equipment used by farm or custom operator meets the protocol requirements. 	<p>Identification of the piece of equipment that actually completed the work (particularly where there are many pieces of equipment).</p> <p>Modifications to equipment may change the amount of soil disturbance created. Project developers may not have updated their file evidence on an annual basis and may not have identified such changes.</p> <p>Best practice would be for project developer's to gain an inventory of all equipment, including model numbers, used on the farm.</p>	<p>The protocol record requirements are clear and photographic evidence (if date stamped) is of significant value. This leads to the primary verification challenges being:</p> <ul style="list-style-type: none"> • Calculation based on the wrong piece of equipment • Modifications to equipment subsequent to measurement <p>Further, dealers and farmers will routinely cite opener widths as 4" or 5", when in fact they are 4.5" or 5.5" when measured. Best practice is to take photos with tape measures showing the actual measurement opening.</p> <p>Assertions by professional agrologists – same as #5.</p>	<p>As part of site visits, where it is evident that a farm has both eligible and ineligible equipment in current use (i.e. good repair) and make no-till claims for all / substantially all of their fields the verifier should gain an understanding of where the ineligible equipment is being used and under what circumstances in assessing the overall reasonableness of the claim.</p> <p>Verification procedures to support use of photographic and documentary evidence may consider:</p> <ul style="list-style-type: none"> • Re-measurement of equipment during site visits (essential) • Reliance only on photos and documentation that relate to the crop year for which the claim is being made • Equipment purchase and sale records should only be relied upon where either the purchase is during or immediately prior to the crop year or the likelihood of modification is remote or additional evidence is provided that indicates the equipment has not been modified (e.g. through project developer due diligence processes tested by the verifier during site visits).

8. Reseeding events	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>Have records been provided for any reseeded events?</p> <p>One additional low-disturbance pass is allowed for reseeded events if total disturbance remains within allowable maximums (see Appendix D of the protocol). Equipment specifications must be recorded in the farm record sheet (see example field sheet in Appendix E of the protocol) indicating dates of initial and reseeded events;</p> <p>OR</p> <p>Sign-off by a professional agrologist who reviewed and collected supporting farm records that confirm the reseeded events and the types of field operations that meet the protocol requirement</p>	<p>The data and record issues associated with reseeded events are the same as those in #6 and #7 above. A further record issue specific to the reseeded events is the identification of sites where reseeded actually occurred.</p>	<p>The primary risk is of unrecorded data. This may be hard to identify.</p> <p>Assertions by professional agrologists – same as #5.</p>	<p>Verification activities should consider checks that would identify a likelihood of unrecorded reseeded events such as:</p> <ul style="list-style-type: none"> • Review of crop insurance claims • Review of seed purchases • Review of equipment rental dates • Identification of fields with delayed harvest • Review of equipment specific GPS data, where available

9. Use of irrigation in Dry Prairie Ecozone, if applicable	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>If applicable, has the proponent provided supporting documentation for water usage on the field by farm operator including two of the following?</p> <ul style="list-style-type: none"> <i>i.</i> Water use records <i>ii.</i> Photo evidence with GPS time stamp showing equipment used including model information <i>iii.</i> Crop insurance records noting use of irrigation <i>iv.</i> Air photo or satellite imagery showing pivots <i>v.</i> Alberta Irrigation Program documents <i>vi.</i> Detailed farm maps showing coverage of irrigation networks over project fields including type and model numbers for equipment being used <p>OR</p> <p>Sign-off by a professional agrologist who reviewed and collected supporting farm records that confirm the irrigation practice and the types of field operations that meet the protocol requirement</p>	<p>Limited – the evidence requirements of the protocol are clear.</p>	<p>Limited – establishing the record requirements of the protocol have been met is straight forward.</p> <p>Care should be taken to ensure that photo evidence, air photos or satellite imagery that are current.</p> <p>Assertions by professional agrologists – same as #5.</p>	<p>Verifiers may consider assessing the materiality of the additional tonnes associated with irrigation in the Dry Prairie Ecozone as part of the verification planning process and scaling the nature of verification activities back to the extent that this element of claims is not material.</p> <p>During site visits to farms with irrigation, records and fields may be viewed to determine if spot cultivation occurred to address ruts in wet spots associated with the irrigation and check that this was disclosed.</p>

10. Timing of verification	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>No protocol specific requirements for the timing of the verification in relation to the crop year.</p>	<p>Some types of evidence (particularly visual observation of field activities) may be critical to effective verification if the project developer does not maintain records which would reduce the need for such evidence (such as ground truthed satellite data, GPS track files for equipment or date and location stamped photos).</p>	<p>Verifiers may be engaged to undertake verifications at a point when the field activities over which visual observation may be a valuable source of evidence is not possible (e.g. due to subsequent practices since the crop year or the presence of snow).</p>	<p>Verifiers should carefully consider whether the scope of their verification has been limited as a result of the timing of engagement. In general, unless ground truthed satellite data, GPS track files for equipment or date and location stamped photos are available it should be assumed that a scope limitation exists and the verification report should be qualified to reflect that limitation.</p>

11. Use of a controls based verification approach	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<p>No protocol specific requirements defining whether the verification should be primarily controls based or substantive based or balanced</p>	<p>Project developers who establish effective, transparent documented controls over all aspects of the data gathering, checking and emission reduction calculation process could yield significant verification savings if the effectiveness of the design and implementation of the controls can be tested by the verifier.</p>	<p>A controls based verification process is likely to be more efficient where the appropriate controls exist. However, in many cases, even where there are effective controls, if they are not adequately documented they do not lead to the ability to conduct a controls based audit.</p> <p>Particular areas where evidence of effective controls would increase the potential for a more efficient verification include:</p> <ul style="list-style-type: none"> • Procedures that define minimum acceptable evidence levels • Documented site visit based due diligence procedures over the decision to contract with individual farms (based on the quality and reliability of evidence assessed during the due diligence process). • Field specific due diligence records in relation to equipment activity (such as date and location stamped photos of activities) • Ongoing documented monitoring of farm conformance with record completeness requirements • Documented minimum training requirements for field staff 	<p>Management letters¹⁷ issued following verifications may consider identifying key gaps in evidence of controls implementation that would make subsequent verifications more efficient.</p>

¹⁷ The “Management letter” is a letter sent by the verification team to their client (the project developer) subsequent to the completion of the verification detailing any observations in relation to the project developer’s data management system that, while not materially impacting the outcome of the current verification, constitute areas where improvements should be considered to both avoid future errors and improve the efficiency of future verifications.

12. Location of fields in the dry prairie ecozone being included in the baseline and project conditions	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<ul style="list-style-type: none"> Does the location of the project field compare to the classification boundary layer file available at http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/cl11708 	Limited- data is readily available.	Limited –focus of testing should be on fields claimed as parkland.	The most effective approach to this test would usually be to assess the project developer’s controls over the query and the subsequent controls over changes to database entries.

13. The crop years used for the baseline	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<ul style="list-style-type: none"> Detailed farm maps showing locations of baseline fields within the farm enterprise for each year for 3 consecutive years immediately prior to project implementation, <p>OR</p> <ul style="list-style-type: none"> If a baseline year is not representative of farm operations, the next consecutive year and justification for why the year was excluded from the baseline calculations <p>AND</p> <ul style="list-style-type: none"> Data to establish the year(s) as typical and thus eligible for inclusion, including detailed farm records of inputs and yields of crops for each field within the farm enterprise (see example in Appendix E). <p>AND <u>one</u> of the following:</p> <ul style="list-style-type: none"> Records from crop insurance showing typical yields and whether field was previously summerfallowed, or Signed-off report that includes all of the above evidence completed by a Professional agronomist who has reviewed and collected supporting farm records that confirm the type of equipment used by farm or custom operator meets the protocol requirements 	<p>Provision of data to support the assertion that the data is for “typical” years.</p>	<p>While the records required for supporting an assertion that the selected years are “typical” are clearly described, a degree of professional judgment is required in assessing whether individual years are in fact typical. This will generally involve looking at a broader range of years than those for which the assertion is being made or assessing accumulated average (yield) information prepared by the farm.</p> <p>Most of the proof that a field was fallow is persuasive in nature as leaving a field fallow does not lead to a trail of records (If there is a crop there is a trail of seed purchases, crop insurance etc. which does not exist when the field is fallow).</p>	<p>Verification data requests should consider a minimum of 10 years information on yields and summerfallow in order to establish whether the selected years are in fact typical.</p> <p>Assessment of whether summerfallow took place will require collection of multiple corroborating pieces of evidence rather than reliance on a single source of evidence.</p>

14. The crop years used if a non-consecutive baseline is used	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
<ul style="list-style-type: none"> Detailed farm maps showing locations of baseline fields within the farm enterprise for each year. <p>AND</p> <ul style="list-style-type: none"> Detailed farm records of inputs and yields of crops for each field within the farm enterprise (see example in Appendix E of the protocol). <p>AND</p> <ul style="list-style-type: none"> Data and trending to establish the year(s) as atypical and thus eligible for exclusion. <p>AND <u>one</u> of the following:</p> <ul style="list-style-type: none"> Records from crop insurance showing typical yields and whether field was previously summerfallowed, or Signed-off report that includes all of the above evidence completed by a professional agrologist who has reviewed and collected supporting farm records that confirm the type of equipment used by farm or custom operator meets the protocol requirements 	<p>Provision of data to support the assertion that the data is for “typical” years.</p>	<p>While the records required for supporting an assertion that the selected years are “typical” are clearly described, a degree of professional judgment is required in assessing whether individual years are in fact typical. This will generally involve looking at a broader range of years than those for which the assertion is being made or assessing accumulated average (yield) information prepared by the farm.</p> <p>Most of the proof that a field was fallow is persuasive in nature as leaving a field fallow does not lead to a trail of records (If there is a crop there is a trail of seed purchases, crop insurance etc. which does not exist when the field is fallow).</p>	<p>Verification data requests should consider a minimum of 10 years information on yields and summerfallow in order to establish whether the selected years are in fact typical.</p> <p>Assessment of whether summerfallow took place will require collection of multiple corroborating pieces of evidence rather than reliance on a single source of evidence.</p>

15. Eligibility of fields during the project condition	Potential data and record issues	Verification Challenges	Recommendations for Verifiers
Proof as stated above that the crop met the requirements for inclusion in the tillage system management component of the Conservation Cropping protocol, including the evidence required above for tillage system management	No additional potential data or record issues.	No additional potential verification issues.	NA

4.1 Designing Controls

A strong control environment is essential to mitigating risks associated with CCP offset claims. Further, the presence of internal controls that are designed to prevent, detect and correct the potential for any misstatements in GHG quantification and claims is an important feature of the control environment. Properly designed controls in the Project Developer's system can mitigate the inherent risks of dealing with multiple farms, each with their own data and record systems, and data collection methods.

Internal controls are policies and procedures that are designed to ensure the GHG data is complete, accurate, valid and not subject to corruption (i.e. reliable). When designing controls, project developers need to consider segregation of duties between the individual responsible for collecting and processing offset credit agreements and supporting data; and the individual approving offset credit agreements and reviewing offset credit files for completeness of information.

Operationally, internal controls can include, but are not limited to, policy and procedures designed and implemented by the project developer in their data management system, such as:

- Front end assessments - a robust due diligence process that screens potential eligible farms/fields and accepts only those with sufficient GHG data and farm records/supporting documentation to participate in the offset claim;
- Data input checks –performed on the data from the eligible farm that checks the detailed activities for each field are entered correctly from base records;
- Data Reasonableness checks – checks over entered data that are designed to flag data outside of expected ranges, data entered in the wrong format, potential duplicate entries, ineligible combinations of activities etc. for management review.
- Data Transformation checks – error checking during the process of collating, transferring, processing, calculating, estimating, aggregating or adjusting input data to detect deficiencies;
- Data output checks – on the distribution of the GHG information and accuracy of the GHG reporting to the GHG claim, to detect any discrepancies in GHG calculations;
- Preventative/detective action procedures – implements risk assessment procedures, internal audits and reconciliation procedures¹⁸ on data input, transformation and output processes to decrease project risk;
- Corrective action procedures – defines, in written procedures, steps to take to reconcile discrepancies discovered in the preventative/detective action system;

¹⁸ Reconciliation procedures detect anomalies in the data by cross-checking GHG data with project sources and other sources of data (e.g. land titles check against farm details; field size against the soil information viewer or Google Earth vs farm record sheets)

- Document control procedures – designed to ensure the most current process documents, or those process documents appropriate for the GHG offset vintages in question, are available for use in quantification and aggregation activities; and,
- Records control procedures – designed to ensure that sufficient and appropriate records are available and readable when needed.

In addition, a number of other controls are recommended to ensure the underlying data supports the offset claim under the Conservation Cropping Protocol. These include:

- Training of staff on the above procedures;
- Management review and approval of offset credit agreements;
- Farm inspection to ensure accuracy of farm records;
- Management review of field activities and equipment specifications to ensure they meet protocol requirements;
- Management review of offset credit files for completeness of information;
- Management review of reported data to ensure it is consistent with underlying offset credit data;
- Exception reports to identify duplicate records, incorrect ecozone classification, incorrect emission factors, etc.; and
- Restricted user access to offset claim data and calculations.

For more fulsome guidance on underlying principles behind how data management systems are designed for integrity, as well concepts such as **data flow**, controls, supporting infrastructure, and how they are interconnected , please refer to the *Offset Data Management Principles for Agriculture*, referenced in the Introduction to this Guide.

5.0 Sufficient and Appropriate Evidence for Conservation Cropping Projects

Project developers need to collect quality evidence to support the GHG claim. Sufficient evidence answers the question of whether enough evidence has been gathered (quantity). Appropriate evidence answers questions of how reliable and relevant the evidence is (quality). Table 8 in the Conservation Cropping Protocol (incorporated into Appendix A in this document) lists the types and number of records that need to be collected and retained, indicating sufficient evidence for each data requirement. However, the issue of what constitutes appropriate evidence is more problematic and subject to interpretation, leading to potential inconsistency in verification opinions. One aspect of appropriate evidence is reliability, the other is how relevant the evidence is to support the particular data point in the protocol - it's important to ensure both are taken into consideration.

In agricultural offset projects, the reliability of the evidence depends on the nature and source of the evidence.

The second aspect of appropriate evidence - relevancy of the evidence to support the protocol data requirement – requires technical knowledge regarding the sufficiency of the evidence to support the data point in the protocol. For example, a project developer will likely have gathered several pieces of evidence in their file for a particular farm. The relevance of the source of evidence for the particular data point needs to be understood by the verifier. For example, seeded area for a field can be documented by several sources – the farmer’s crop plans, crop insurance, Canadian Wheat Board permits, custom seeders, custom sprayers, certified crop advisor’s crop plans prepared for the farmer, Agri-Stability claims, etc. Different pieces of evidence have different levels of reliability in relation to the seeded area and a clear understanding of the relative reliability of the evidence types is critical to both project developers and verifiers in assessing records. Project developers need to specify why the sources of evidence are relevant for a particular data point and verifiers need to understand the characteristics of the evidence sources in order to judge appropriate evidence correctly. Since the protocol defines the types of evidence acceptable to prove eligibility or substantiate the quantification, the Project Developer needs to produce evidence that meets Protocol requirements.

A list of sufficient and appropriate evidence for each data requirement in the Conservation Cropping Protocol is given in Appendix A, with an emphasis on primary and corroborating evidence.

Appendix A – Evidence Matrix

Principles:

- Data Controls identify the sufficient and appropriate evidence for a particular data requirement in the Conservation Cropping Protocol;
- Appropriate sources of evidence avoid mis-interpretation/confusion in verification processes, when inappropriate/insufficient sources are considered against a data point
- Best practice is to assess all sources of appropriate evidence listed below in the matrices; and select the most conservative piece of evidence for the project.

Table A1: Field Size and Seeded Area – Appropriate Evidence

Intent: Need to understand the field size (likely one time measurement), and then the seeded area on an annual basis, to accommodate annual fluctuations in seeded area enrolled and demonstrate excluded areas of the field.

Scenarios	Farm Sources	Third Party Documentation		
	GPS track file or shape file from farm seeding equipment, date stamped	Annual GPS shape file from field inspection, showing seeded area	Measurement of field size using Google Earth, air-photos or satellite data, time sensitive	Measurement of field size using GPS (AFSC,INAC or another third party)
Scenario 1		√		√
Scenario 2	√			√
Scenario 3			√	√

***Sources considered inappropriate include land titles (as it does not identify what is croppable) and crop insurance records (as the area listed may not meet the materiality requirements of the protocol with respect to accuracy).**

Table A2: Existence of an Annual Crop– Appropriate Evidence

Intent: Evidence must include one source of detailed farm records **and** a primary piece of evidence, either in the form of third party records that are specific to each field and crop sown, or a signed evaluation by a Professional Agrologist confirming the detailed farm records are correct.

Scenarios	Primary Documentation from Farm Sources	Secondary Documentation			Acceptable Alternative Combination of Records					Sign-Off by a P.Ag.
	Farm Crop Plans and/or Farm Record Sheet ¹	AFSC Records ⁴	Crop/ Field Photo (date, location reference, GPS file)	Custom Spraying/ Seeding Receipts ³	Direct Seeder GPS Coordinates for the Field	Canadian Wheat Board Permits	Tractor Hours/ Power Units	Seed Purchase Receipts or TUAs ²	Custom Seeding/ Spraying Receipts	
Scenario 1	√	√								
Scenario 2	√			√						
Scenario 3	√		√							
Scenario 4	√				√ Combination of supporting records gathered by the P.Ag. that led to professional judgment and sign off ⁵					√

¹ Farm Record sheets/crop plans must specify all land disturbance activities by field, by date, including but not limited to seeding, fertilizing, manure spreading/incorporation and discretionary tillage, where applicable

² Seed purchase receipts may be used to provide supporting evidence of the crop seeded when the seed has been purchased from a third party, or under a TUA – technology use agreement. These are only considered an acceptable source of evidence to the extent that the volume of seed purchased is reconciled against the area of fields planted with that seed.

³ Custom work receipts must be field specific, with area worked, and documenting type of crop seeded/sprayed.

⁴ AFSC Records include Crop Insurance forms, insurance claims through programs like Agristability, or Soil Moisture Program or others, BUT must reference field legal land description and Crop type.

⁵ This evidence is only acceptable if the P.Ag. has their own records that back up sign-off evaluation and they should expect to have this checked by the verifier.

Table A3: Occurrences of Soil Disturbance on Each Farm Field Being Claimed – Appropriate Evidence

Intent: Understand the types of equipment on the farm and whether disturbance activities conform to the protocol requirements (other than seeding implements)

Scenarios	Farm Sources		Primary/Third Party Documentation			Sign-Off by a P.Ag. in relation to the disturbances per field
	Farm Crop Plans and/or Farm Record Sheet ¹	Invoices and Time Stamped Photos of Disturbance Equipment	Direct Inspection	Geo Referenced Photo of Field for Spot Tillage	Crop Advisor Records ²	
Scenario 1	√	√	√			
Scenario 2	√	√ Gathered, maintained and signed off by a P.Ag confirming the disturbance is correct. ³				√
Scenario 3	√				√	

¹ Farm Record sheets or crop plans must specify all land disturbance activities including but not limited to seeding, fertilizing, manure spreading/incorporation and discretionary tillage, where applicable

² Crop Advisor Records here means crop planning and agronomic records developed by a 3rd party such as a Certified Crop Advisor or P.Ag., which include a listing of disturbance activities by field

³ P.Ag. sign off is for the activities that occurred AND the equipment that exists. Records need to be kept to substantiate the P.Ag. evaluation.

Table A4: Seeding/Fertilizer Specifications Used Each Year – Appropriate Evidence

Intent: Understand the types of seeding/fertilizer equipment on the farm and determine the level of soil disturbance incurred. Evidence required includes a calculation of the percentage of soil disturbance, supported by evidence of the equipment used.

Scenarios	Supporting Documentation					
	Calculation of the percentage of soil disturbance ¹	Photo evidence with time stamp of equipment used (date, opener width, distance between shanks)	Custom Seeding/ Fertilizer Receipts	Equipment model number, serial number	Equipment purchase and sale records	Sign-Off by a P.Ag.
Scenario 1	√	√				
Scenario 2	√		√	√	√	
Scenario 3	√	Combination of supporting records gathered and maintained by the P.Ag. that led to professional judgment and sign off confirming the type of equipment used.				√

¹ This should be calculated by the project developer based on farm records (number of passes, etc.) and the specifications of the farming equipment.

Table A5: Reseeding Events (If Applicable*) – must be disclosed; appropriate evidence below.

*One additional low-disturbance pass is allowed for reseeded events if total disturbance remains within allowable maximums (see Appendix D of the protocol)

Intent: Understand the types of equipment on the farm and whether disturbance activities conform to the protocol requirements (i.e. do not exceed soil disturbance requirements)

Scenarios	On-Farm		Third Party Documentation			Sign-Off by a P.Ag.
	Farm Crop Plans and/or Farm Record Sheet ¹	Time-stamped photo record of equipment used (date, opener width, distance between shanks)	Direct Inspection	Insurance Claims (AFSC Records)	Crop Advisor Records	
Scenario 1	√	√	√	√		
Scenario 2	√				√	
Scenario 3	√	Combination of supporting records gathered by the P.Ag. that led to professional judgment and sign off confirming the assertion is correct				√

¹ Farm Record sheets or crop plans as per above, but detailing dates of re-seeding events.

Table A6: Use of Irrigation in Dry Prairie Ecozone (If Applicable) – Appropriate Evidence

Intent: To confirm if irrigation occurred, which increases the carbon sequestration potential of dry prairie soils in relation to that of parkland soils.

Scenarios	On-Farm		Third Party Documentation						
	Farm Crop Plan	Water use records by field	Crop insurance records noting use of irrigation	Air photo or satellite imagery showing pivots for the project year	Alberta Irrigation Program Document - Water Rights	Detailed farm maps showing irrigation networks ¹	Pumping Records w/hours metered	Water Bill	Sign-Off by a P.Ag.
Scenario 1	√	√ Any two of these items							
Scenario 2	√	√ Combination of supporting records that led to professional judgment and sign off by a P.Ag. confirming the assertion is correct							√
Scenario 3	√			√				√	

¹ Including type and model numbers for equipment

Additional Evidence for Summerfallow Reduction Projects

Table A7: The Crop Years Used for the Baseline

Intent: To confirm that the baseline was established based on three years of typical farm operations

Scenarios	On-Farm	Supporting Documentation			
	Farm records (of inputs)	Crop yields (e.g. yield monitors, weigh wagon records, sales receipts, crop advisor records, bin counts, GPS data)	Detailed farm maps showing baseline field location	Crop insurance records (showing typical yields and whether field was previously summerfallowed)	Sign-Off by a P.Ag.
Scenario 1	√	√	√	√	
Scenario 2	√	√	√	Combination of supporting records that led to professional judgment and sign off by a P.Ag. confirming the assertion is correct	√

Table A8: The Crop Years Used If a Non-Consecutive Baseline is Used

Intent: To document atypical crop years and provide justification for exclusion of a particular year in favour of the next consecutive year

Scenarios	On-Farm	Supporting Documentation				Sign-Off by a P.Ag.
	Farm records (of inputs)	Crop yields (e.g. yield monitors, weigh wagon records, sales receipts, crop advisor records, bin counts, GPS data)	Detailed farm maps showing baseline field location	Crop insurance records (showing typical yields and whether field was previously summerfallowed)	If applicable, justification for excluding a year from the baseline (data and trending to establish the year(s) as atypical) ¹	
Scenario 1	√	√	√	√	√	
Scenario 2	√	√	√	Combination of supporting records that led to professional judgment and sign off by a P.Ag. confirming the assertion is correct	√	√

¹ Three consecutive years are typically used to establish the baseline, unless a baseline year is not representative of farm operations, in which case the next consecutive year can be used if justification is provided for why the year was excluded.

References

- Government of Alberta. (2012). Quantification Protocol for Conservation Cropping. Version 1.0. Retrieved from <http://environment.gov.ab.ca/info/library/8561.pdf>.
- Government of Alberta. (2013). Technical Guidance for GHG Verification at Reasonable Level of Assurance. Retrieved from <http://environment.gov.ab.ca/info/library/8802.pdf>.
- Government of Alberta. (2013). Technical Guidance for Offset Project Developers. Retrieved from <http://environment.gov.ab.ca/info/library/8525.pdf>.
- Government of Alberta. (2012). Technical Seed Document for the Quantification Protocol for Conservation Cropping. Retrieved from http://carbonoffsetsolutions.climatechangecentral.com/files/microsites/OffsetProtocols/12-04-02_Conservation_Cropping_v1_TSD.pdf
- KPMG. (2013). Conservation Cropping Protocol Validation Study Mock Verification Report.

Glossary

CCP Project Developer	The entity that implements the Conservation Cropping Protocol on multiple farms, within an Offset Project, in order to aggregate the requisite number of tonnes for verification, registration and marketing purposes.
Farmer	The entity managing the land. In some cases it can be the landowner who farms the land. In other cases, the landowner leases the land to a lessee or tenant to manage. In the latter case, an offset credit agreement is required.
Farm Record	Records that the farmer uses to document the farming activities that occurred on a field or documents obtained from other parties such as rental agreements for leased land, insurance records, crop plans, custom seeding receipts and invoices for equipment purchases (see Appendix A for examples).