



# Climate Change Central

## Direct Reduction – Technical (First) Round Review

Friday , September 24<sup>th</sup> , 2010

9am MDT

Teleconference

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**Meeting called by:**

Samuel Elkins

**Invitees:**

Milo Mihajlovich

Kevin Kemball

Frazer Butt

Juri Agapow

Samuel Elkins

Robert Volkman

**Note taker:**

Tanya Maynes

Robyn Kuhn

Bob Savage

Tanya Maynes

Amanda Stuparyk

**Absent With Regrets:**

Dave Blackmore

Karen Haugen-Kozyra

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**Documents:**

1. Draft Direct Carbon Reduction Protocol
2. Direct Carbon Reduction Protocol TPP
3. Direct Carbon Reduction Protocol TSD

**Agenda**

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1. Introductions – *Milo M*
2. Why We're Here – Alberta Policy Context – Tanya Maynes
3. Principles to Guide Protocol Decisions/Development - Tanya Maynes
4. Introduction to the Protocol – *Milo*
  - General overview of the Protocol – Format; ISO 14064-2 Approach; process flow diagrams; SS diagrams.
5. Review of the Protocol – *Milo*
  - More detailed run-through of the Protocol elements, basis for the flow diagrams, identification of SSs, rationale for exclusion or inclusion, quantification approaches and appendices, discussion points.
6. Next Steps
  - AB protocol review process

- Comment submission deadline

## Minutes

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### 1. Introductions – Milo

Most participants have been involved at the table. Challenge has been with generic vs. specific protocols. Like to keep this in mind throughout today's discussions.

Most of the input has been specific and addressed throughout the process.

Protocol focus has been on clarifying the definition of the three conditions.

### 2. Why We're Here – Alberta Policy Context – Tanya Maynes

Little background information:

- Alberta Environment (AENV), on behalf of the Government of Alberta, regulates greenhouse gas emissions reductions in the province, they are the regulators and policy decision makers.
- AENV has contracted with Climate Change Central (C3), a public-private partnership, to facilitate the protocol development process among other programs.
- AENV retains final approval for all protocols developed under the Alberta Offset System.

Touching on some background information of Alberta's Regulatory Framework.

- As of July 1, 2007 the Alberta Government has brought in a Regulatory Framework (enabled by first Climate Change and Emissions Management Act) the Specified Gas Emitters Regulation (SGER).
- This regulation lays down the framework for a compliance-based carbon market, by establishing market demand and enabling market supply:

#### OPTIONS FOR COMPLIANCE

- a. Internal Reductions
- b. Performance Credits (beyond reduction target intensity)
- c. Alberta Technology Fund \$15 tonne (unlimited access) –
- d. Offsets – Regulated entities can purchase verified emission reductions and/or removals (offsets) from voluntary projects that reduce GHG emissions arising from unregulated activities

The Alberta Offset System design centres around 6 Key Principles:

- **Administratively Simple:** the Offset System, including design, implementation and key functions, should be administered in a simple, cost-effective and timely manner; No validation step – like CDM and Canadian System have Pre-Validation step
- **Maximum Scope:** the Offset System should, over time and to the extent practical, promote and enable projects in all sectors and of all types and size;
- **Building and Linking:** the Offset System should seek to maximize efficiency and resources by building on and linking with existing programs and trading systems;
- **Transformational Change:** the design should support transformational change across all sectors of the economy and society in such a way that emission reductions and removals are a part of daily decision-making by Albertans. This change will be enabled, in part, by the deployment of proven, enhanced and innovative technologies with support from public education, regulatory and other policy direction to drive the behaviours necessary to contribute to overall reductions.
- **Environmental Benefits:** the design must ensure project-based emission offsets result in further reductions and removals in greenhouse gas emissions, than would be the case if offset credits were not available. Other environmental benefits can be addressed when considering project eligibility.

• **Transparency and Accountability:** to earn public confidence and mitigate conflicts of interest, the offset system must maximize opportunities for public scrutiny and input at the level of individual projects; and ensure robust, independent verification of emission reductions and/or removal enhancements while respecting confidential business information.

Offsets – Emerging Carbon Market in AB – The Alberta Regulations define necessary eligibility criteria for generating and using emission offsets for compliance here in Alberta. Some important criteria are:

- Projects **start** after Jan 1, 2002 (stems from ABs first climate change plan (A Plan for Action 2002 was released), intensity reduction talks, carbon price signals, with anticipation of this signal people may have started to implement changes in regard to GHG reductions)
- **Real** (project must have specific and identifiable actions that reduce or remove one of main GHGs; beyond business as usual practices), demonstrable, quantifiable (GHG reductions must be calculated and measured according to scientifically acceptable methods)
- **Not regulated by law** – must be incremental to provincial regulations
- Clearly defined **ownership** (verifier will seek clear ownership) ie. Tillage projects in Alberta in last compliance – crown land, land lessees, projects where a technology service provider is installing a unit that results in emission reductions, or where multiple entities are involved
- Generated in **Alberta - investment** / project **undertaken** in Alberta
- **Not double counted** (only serialize on one system, used for compliance once)
- **Verified** by independent 3<sup>rd</sup> party (chartered account/certified engineer)

The Government developed the first series of 15 Quantification Protocols in Alberta were initially developed using Good Practice Guidance and adapted from previous protocol work coordinated by federal-provincial and territorial governments from 2003 to 2006.

The Protocol Development Process was opened up in late Fall 2007 to encourage industry and other interested stakeholders to share in development costs, by bringing forward new protocols. More on the protocol development process can be found in a Draft Guide to Protocol Developers.

We are here today to complete **Step 7 of 11 in the Alberta Protocol Development Process – First Round of Review - Expert Technical Review**. We want to ensure that this Protocol undergoes technical review by third-parties who have not yet been part of developing the protocol (similar to scientific peer review). Expert technical review ensures transparency and helps identify potential issues early in the process. Consensus must be reached and at this stage is defined as ‘no sustained objection’.

Based on the feedback from the first round, revised versions are circulated for comment and feedback with a final close date to gather comments. Once all comments are gathered and consensus is reached all changes should be incorporated into a final revised version of the draft protocol.

All comments and changes should be recorded and ultimately sent to Climate Change Central to post on the [www.carbonoffsetsolutions.ca](http://www.carbonoffsetsolutions.ca) website for transparency purposes. Begin initiation of Second Round Reviews.

Alberta Environment – What AB wants in a protocol:

- Clarity – making sure it’s clear and understandable. No ambiguity or grey areas.
- Specific on activities that are included/excluded and why?
- Baseline conditions
- Strong emphasis on record retention – what kind of documents are needed

- Ability to meet reasonable assurance – tentatively thinking 2012. Need a clear easy to follow methodology, good records, documentation and data management system. Need to be spelled out in the protocol.

### 3. **Principles to Guide Protocol Decisions/Development - Tanya Maynes**

The Alberta Government would like the technical reviewers to keep 4 main principles in mind when weighing in on the protocol:

#### Principals to Guide Protocol Development

##### 1. Environmental Integrity

-Considering all GHG sources controlled, affected, and related to the project

Related, Controlled, Affected definitions;

Related – SS generally upstream of project -

Controlled – Project developer has control over, on the site –

Affected – Downstream of project activity having an impact (i.e. city offsets for transit infrastructure affected traffic congestion (less due to increased ridership) then due to that, people start driving more)

2. Usability/Practicability - reasonable level of rigour and integrity – realistic, using consistent approaches to decide what needs to be quantified in baseline and project

3. Adapting Precedents – set elsewhere, used in other systems

4. Streamlined Life Cycle Analysis – Completeness as outlined by the ISO 14064 framework - Cumbersome, but comprehensive. The Protocols are based on the ISO 14064 Part 2 Project level Standard.

Throughout the entire protocol development process we want to keep the following in mind:

- Relevance – Consider the right GHG sources, sinks, reservoirs, data and methodology
- Completeness – are we including all relevant GHG emissions and removals
- Consistency – need to ensure a meaningful comparison of GHG information
- Accuracy – minimize bias and uncertainties as much as practical,
- Transparency – disclose sufficient and appropriate GHG related information to provide decision makers with reasonable confidence, and
- Conservativeness – use conservative assumptions, values and procedures to ensure calculations are not over estimating

Which involves a LCA of project and baseline, and then selection and relative quantification of relevant Sources and Sinks between the two. Beginnings of project through to aftermath

- Involves identifying emission sources and sinks upstream and downstream of the project, as well as in the baseline and project conditions
- Allows you to consider all the possible impacts on project and baseline condition

\*\* More on the Alberta offset system can be found at [www.carbonoffsetsolutions.com](http://www.carbonoffsetsolutions.com)

### 4. **Introduction to the Protocol**

Format – followed the Draft Guide for protocol development.

Leakage – co-implementation discussion with Biomass to Energy Protocol. Concern over leakage due to chipping things that would have gone to biomass energy. Potential removal of biomass from energy sector.

Process Flow diagrams – tried to follow the format and approaches outlined in the guide for protocol

development. Separate the baseline from the project condition. Challenging as there are three different ways of producing chips.

RK – clarification of in block chipping vs. satellite yard vs. mill yard. Use portable chippers in the yard to chip. What is the difference between the mill yard and the wood room?

MM – before the adoption of portable chipping, chipping occurred in the wood room. A facility that strips the bark and then chips. A stationary facility. That facility was powered by electrical energy – either the grid or co-gen. More energy efficient than portable chippers in the mill yard which are powered by diesel engines.

In the process flow and source sink diagrams – separate the various conditions of the change practice because it simplifies what otherwise could be confusing.

TPP – look on page 15, Figure 2. **To be put in the protocol**

## 5. **Review of the Protocol**

Dave Blackmore sent questions and comments

### **Section 1.0**

- RK – Break out the three as bullets to distinguish in protocol type. AS – protocol scope or applicability could provide more detail – as a number as well as what is required for eligibility.
- Insert page 15, Figure 2. **To be put in the protocol in section 1.0**
- Quantifying in block chipping and how it is more efficient in its use and less diesel fuel is being burned. This is a direct reduction of performing the same task. Not replacing equipment but applying portable chipping technology and a more efficient use of equipment.

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### **Section 1.1**

- General description of the approach
- Preferred method is to know how much fuel was consumed in total and calculate from there. Alt is to use equipment and hours of operation to calculate fuel use.
- Because this is a direct reduction – no sequestration.
- Hog fuel must be calculated.
- RK – does this protocol need to be co-implemented with the biomass protocol?  
In its simplest form, no requirement to co-implement if you know the weight of the hog fuel. For every unit of harvest, you get increased use of the tree per unit of harvest. In order to make sure that you are not going to double count this, if any of that may be used as Hog fuel, you can't count it. Described in a later section.
- If you don't know that realized volume of Hog, than you have to assume if it was in an economical haul distance to the mill, you need to assume it was all Hog. It's very conservative to assume the increase in tree use efficiency was hog.
- Stackable with the biomass protocol and not required.
- Functional Equiv – actual harvest per year.
- Using the CO2e values – **link to the climate change emissions management act to account for any updates**. Legislation has numbers. **RK to send specific reference to the act**

### **Section 1.2 – Protocol Applicability**

- Discussion of co-implementation with biomass protocol is included in 1.2.

### 1.3 Flexibility provisions

- Are they of equivalent level of rigour?
- They require assumptions but are equivalent.
- RK – will most people not have the records that you've identified? What is the case for the flexibility mechanism?
- Most robust, because if you know the diesel fuel was provided for harvest, you know it was consumed. Doesn't matter where. If it was provided to the machines, you are assuming it was consumed by the machines. It's actually more conservative than allocating it between usage – captures idling, repairing, operating, etc.
- Performance Baseline – 11
- MM – competitor in terms of terrain and area harvest, FERIC paper demonstrating pre-project condition and baseline.
- RK - What if they change their minds? Some discomfort.

### 1.4 Glossary of Terms

- Definitions, TM to send
- To include image like afforestation protocol

### 2.0 Baseline Condition

- Comparison baseline – whole tree harvest traditionally practiced throughout AB.
- Assumption that all fuel is combusted and attributed to BL condition. Necessary because it's not feasible to partition diesel fuel throughout the different activities involved in harvest. I.e. Fuel is provided for harvest – doesn't matter what machine is used.
- Alt mech of baseline calc by hours of operation.
- Baseline has both static and dynamic components
- Examples of baseline condition harvest are available for comparison.
- Harvesting that occurs in the block per unit of harvest. The actual emissions are attributable to transportation as it depends on roads, fleet, quality of roads, etc. A performance baseline won't reflect this.
- Performance standard is a standard across industry.
- Comparison is only used for harvest - static. All other portions are dynamic.
- This is a combination baseline – needs to be clarified. Comparison for a portion and a projection for the other part. Necessary because there is so much different each year – road, conditions, etc.
- Request for cheat sheet on baselines.
- Page 13 – Historic benchmark approach for comparison of wood room chipping with portable chipping.
- Clarification needed – be specific and clear.
- Discussion of Figure 1
- Table 2
- TM to send comments on Table 2.
- Change B15 to Generation of Electricity from Hog Fuel. Place \* to be clear on biomass protocol. If

biomass was used prior to 2002, than biomass electricity generation may not apply.

- Discussion of baseline components to Quantification 4.0
- Discussion of points on page 27
- Table 4a:
- Q on B3 – What about chip pads, turn around etc.
- A: Captured in total fuel use therefore its quantified and captured. Depending on block layout it may be more or less.
- Q on B6: Tree felling and skidding – q regarding less buncher and skidder activity.
- A: for an individual tree, get more volume in the project condition from use of in block chipping . TO get to the same level of mill furnish, less activity/machinery is required. Result of improvement to efficiency.
- Discussion of quantification of the components of the baseline and the project
- January 1, 2002 is the start date of the system. Need to define the first full year of commercial operation – testing doesn't qualify.
- Useful to ID what components are comparison, projection, historic, etc in the discussion of methodology in 4.1

### 3.0 Project Condition

- Clarify the three opportunities of portable chipping
- Discussion of project condition
- Each project condition must be quantified separately
- Discussion of table 3
- Clarify that to get the full accounting you need to include all the project conditions
- Remove the Note at the bottom of 31
- Discussion of Quantification of Project Condition

### 4.1 Quantification Methodology

- Discussion of quantification of the components of the baseline and the project
- January 1, 2002 is the start date of the system. Need to define the first full year of commercial operation – testing doesn't qualify.
- Useful to ID what components are comparison, projection, historic, etc in the discussion of methodology in 4.1

### 5.0 Data Management

- RK – looking description of the minimum records

### 5.1 Project Documentation

- Minimum laid out in section 5.1
- Detailed Forest Management Plan
- As Built – digitally corrected maps
- Ongoing stumpage payments. This is quality data and should be explicitly included. Will make verification easier.

- GIS data, lat long of each individual block quantified in this protocol
- Examples of software, but not necessarily specific.
- Want more specific on the types of records
- Metered data, fuel receipts, weight scale tickets,

### 5.1 Project Documentation

- Add a list of acronyms

## 6. Next Steps - Protocol Developer/Climate Change Central

- AB protocol review process
  - Based on the feedback from the first round, revised versions are circulated for comment and feedback with a final close date to gather comments. Once all comments are gathered and consensus is reached (no sustained objection) all changes should be incorporated into a final revised version of the draft protocol. All comments and changes recorded are to be forwarded to AENV and C3 for review as described above. Climate Change Central will post records of discussions and changes on the [www.carbonoffsetsolutions.ca](http://www.carbonoffsetsolutions.ca) website to ensure ongoing transparency.
  - After the completion of the review period and consensus (no sustained objection) is reached, the protocol documentation is submitted to Alberta Environment and Climate Change Central. If AENV and C3 have not put out a “Call for Protocols” on the Carbon Offset Solutions website indicating a 2<sup>nd</sup> Round of Technical Review will be conducted, submission of the draft protocol will not proceed further in the development process until an official call for protocols is initiated.
  - Deadline of two weeks today for submission of a final protocol by Oct 1. Final comments due by October 4<sup>th</sup>. Turn it around with a draft to circulate by Oct 8. Final comments on Draft 2 due on October 13.
  - A lot of clarifications have been made; want to see a final draft protocol for early to mid **OCT – no later than the 15<sup>th</sup>**. This way we will have a final working draft for the OCT call.
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# Climate Change Central

Wednesday, May 05, 2010

## Direct Carbon Reduction- Technical Review Committee

9am – 1:30

C3 Edmonton Boardroom

### Meeting called by:

Milo M

### Note taker:

Tanya & Sam

### Attendees:

Tanya Maynes – Climate Change Central  
Samuel Elkins – DMI  
Robyn Kuhn – AENV  
Dave Blackmore – Woodlands Operations Learning Foundation  
Frazer Butt – SRD  
Tim Barker - DMI  
Robert Volkmann - JEDROC  
Juri Agapow – FP Innovations  
Milo Mihajlovich – Incremental Forest Technologies Ltd.

### Absent With Regrets:

### Documents:

Draft TSD

### Minutes

#### Technical Review – Forest Harvesting Direct Reduction Protocol

##### Review of ABOS

- Review of the Alberta offsets system and protocol development process.
- Exploring Carbon offsets for this activity started about 2 years ago.
- Been working on developing this for about 6 months.
- Breaking ground in that we have a fairly integrated system of emission regulations that include offsets. AB has high quality offsets with higher prices. There is a clear system in AB with a lot of guidance and well laid out process.
- Need to demonstrate that an offset is equal to a dollar coming into the Climate Change Emission Management Fund. Could end up in a qualification of the AENV books.

##### Message from the Regulator

- From a regulator perspective - Need to ensure that we are crediting what should be credited. What documents are needed? How do we ensure that what we are tracking is a real reduction? Protocols going forward need to be more prescriptive – stating minimum records, stating baseline and project, explicit

language. Prefer direct reduction rather than.

- Working internally on better guidance for verification. Right now at a limited level of assurance – don't think that anything is wrong with this project. Moving to a reasonable level of assurance – a positive statement – nothing is wrong.
- Very focused on verification and the need to support the activity.
- Professional engineer and chartered accountant are needed to sign off. Worked well for facilities reporting. Guidance to companies is to have those people on staff even though they can't sign reports. Working closely with standards council of Canada. Work in progress.
- Auditing association of Canada is very concerned with P. Engineers and CA's signing off.
- System of learning by doing – but soon the learning should be done. Message to individuals is – you can expect to start to face penalties if you are practicing beyond your scope.

### **Direct Emission Reduction Quantification**

- Trying to quantify and verify **direct** reduction
- Goal: to comply with ISO 14064-2 and ABOS
- Benefit is three fold:
  - There is a substantial increase in wood volume recovery per harvested ha in portable chipping.
  - Increase in recover means burning less slash.
  - Therefore transportation reduction – move more usable fibre per L fuel burned.
- Must demonstrate that it is a true change in business practice – it is not business as usual.
- This project demonstrates it meets the ABOS criteria (see slide).
  - Change made in 2003
  - Change in business efficiency decision not driven by regulation or compliance
  - PRPD is the only mill in AB to use portable chipping
- Today's focus is how to quantify emissions accurately – quantify the base case and quantify the change in practice. Had we not adopted portable chipping, what would emissions have been? Since we did, what are the emissions? The difference is the eligible offset.
- Question: What about Hog fuel? How much is burnt? How much is left?
- Need to put it in the source and sink document. Need to account for hog process – it's processing and transportation. Needs to be accounted for.
- What about a zone? Within the zone goes to the mill as hog, outside, is left?
- Use a portion as hog.
- Portable chipping is quite discrete. Whole tree haul is still existing – sometimes to satellite yard. Need to assess – whole tree logging.
- Using a performance based baseline – looking at the volume of mill furnish that we can apply the base case. Based on furnish.
- Switching from using biomass in block to FF – is this accounted? Yes, it's considered in electricity generation on site. It looks at all the energy. Will be considered in the quantification.
- Because the wood room is closed, the base case no longer exists. Need to determine the intensity of the base case and apply to the mill furnish to determine baseline emissions. Taking the three years prior to the change in practice 2002 -2002 – determine the intensity per tonne of mill furnish (considering all sources). This intensity will be applied going forward to determine baseline emissions.
- In presentation, emission factor of diesel is incorrect – it's corrected in TSD Doc.
- Difficulty finding a number for burning wood-waste in the forest. Varies substantially by species and moisture content. Factor found on US DOE website. Factor is specific to species. Talk to Canadian Wood Centre – might be able to assist. Need to ensure that Derek Sidders or Dalabour(?). (98 is for Aspen).

- Key factor is to recognize that the chippers are used in 3 locations but they are all the same.
- With trucking, look at the annual average haul distance to come up with a fuel consumption of hauling. Also need to consider waiting time (takes less time to load)
- Difference in load size (Summer vs. Winter).
- We don't use financial additionality as a tripping point of the system. We have a 8 year period, plus possible 5 years – therefore it shouldn't be dependent on the sale of C offsets (financial additionality).
- Need to ensure that you are handling the practice of hauling to sat yards and chipping form there.
- 20% enhanced recovery in project case.
- With block cleanup – 20% less slash burn than with whole tree logging.
- ON doesn't allow burning of chip piles at all. Must all be spread in-block.
- Verification is fundamental to the creation of a high quality offset. Needs to be consistent with iso 14064-2.
- Need to clarify with contractors who the owner of the offsets is.
- Validation is not required... it's a risk management. TWG is looking at completing a gap analysis. See value but difficult to find participant to complete it. Speaking with Chris Ridley-Thomas, probably be the ones to do the gap analysis. Gap Analysis – just to identify weaknesses – not how to correct. As long as you are following a standard and what's in place, there is no conflict of using the same validate and verifier.
- We've seen some conflict of interest – if a company provides consulting services, they cannot verify. Needs to be managed accordingly.
- Wood room chipping produces a different chip than in-block. Is this accounted for?
- Will need to be adjusted – to be explored. At the end of the day, need to ensure it's not a major difference. Might be in the background.
- Excellent information on portable chipping – data collected.
- Need to consider material errors and immaterial errors. In ABOS 5% is the material level. It's an error correction policy. Not to be used for exclusion. Need to ensure that it's consistent with ABOS. If it's negligible, quantify that way.
- Key step in ensuring protocol will meet ABOS requirements. Ensure compliance with ISO.
- Key things to consider:
  - Additionality
  - Leakage – don't want to create offsets that simply cause an emission somewhere else.
  - Environmental Integrity
  - Completeness
  - Consistency
  - Transparency
  - Relativeness
  - conservativeness
- Tried to ID in table 1 how this protocol complies
- Figure 2 – S&S
- Criteria questions:
  - What about within just AB, in other jurisdictions it can be quite well adopted?
  - Yes, it still applies. Not much chipping in W Can, a lot in ON.
- Still need to do a side by side comparison of biomass protocol. Generally, protocols are stackable, if under the threshold, there is nothing stopping you from doing the biomass and in-block chipping together (if it's possible). Biomass protocol will be reviewed this year to examine assumptions.
- General comfort with figure 1
- What about breakage due to multiple handing? Not a big deal because chipping. Minimum length of 6 ft

for the chipper. FERIC has been working on this – it’s an impact of multiple handing. Juri to send Milo studies completed.. Some studies exist, not hard to include. If it doesn’t go through the chipper, it might get hogged and go to the mill. Might be more a conifer issue – 10%.

- Recognize the switch to low S diesel is a regulated change – not seeking offsets once the reg took place. Can demonstrate a switch earlier than legislation required. Regulation was passed in 2000-2001 – set dates for adoption. October 31, 2006 was set as the date to switch – all on road equipt had to switch to low S. Effective in 2009, all on road had to switch to Ultra Low. In both cases, DMI switched ~2 years in advance. Reduction in SF6 due to switch form 500 PPM to 50 to <10.
- The switch was brought on by suppliers switching early. The Reg’s start date was set recognizing that time was needed to make the switch. Initially, unlikely – Robyn will circle back.
- Take a look at the dairy protocol to see language on data management.

**Action items**

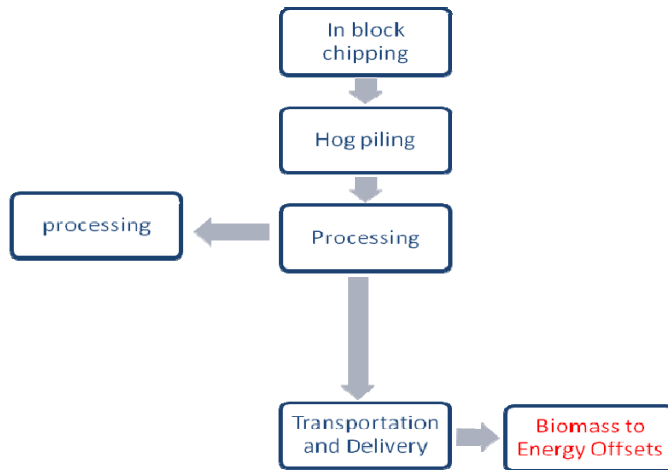
**Person responsible**

- |   |       |
|---|-------|
| ✓ Need to put hog in the source and sink document. Need to account for hog process – it’s processing and transportation. Needs to be accounted for. | Milo  |
| ✓ Examine the use of whole tree logging together with block side chipping – Sometimes to satellite yard. Need to assess – whole tree logging.       | Milo  |
| ✓ Talk to Canadian Wood Centre regarding emission factor for burned debris  | Milo  |
| ✓ Wood room chipping produces a different chip than in-block. Is this accounted for?  | Milo  |
| ✓ Incorporation of breakage in satellite chipping   | Juri  |
| ✓ Explore early use of low S Diesel   | Robyn |

**Other Information**

Additional changes to Draft TSD

1. Changes to Figure 1
  - Addition of Hog Processing & transport
  - Amend P8 to “Slash disposal and site reclamation”



2. Changes to Table 2

- Change Sources from “P” to “B”
- Change B10 to ‘block cleanup and reclamation’
- Add wait time to transportation?
- Add log handling
- Add hog
- Ensure slash is net of industrial salvage

3. Change to Table 3

- Add Hog

4. Changes to Table 4

- Explore and add if necessary breakage (loss of volume)

5. Changes to Table 5

- Make P14 & p10 Explicit

6. Additional Change

- Check with Dairy Protocol on Record Keeping & Verification Section

Samuel Elkins  
Robert Volkman  
Kevin Kemball  
Fraser Butt  
Robyn Kuhn  
Dave Blackmore  
Milo Mihajlovich  
Karen Haugen-Kozyra

Sam – Juri to have called with concerns. Did not call so presume no concerns from him.  
Get rid of “inadvertently” cut wood.

MM – replace with “lowered merchantability standard”

Dave – Review of questions? Will proceed through the doc with track changes and answer questions.

Karen – Transportation, more fuel use?  
No, transportation is less.

Karen – Chipping quantifications by type of fuel (wood room).  
Will be specific in both documents.

Karen – Leakage with harvesting change and methane?  
We are using CO<sub>2</sub> equivalent calculations so capture methane.  
Other parts of harvest are not changed from the baseline.

Karen – Leakage with harvesting and reduced hog fuel?

Karen – should address if other operators adopt this technology. Include as “related emission” in the protocol doc (in the template).

RV – location and other aspects of harvest remain the same. Hog can be from other sources. Some mills do not have co-gen and sell unused biomass to others with co-gen.

SE, KK, MM – need a paragraph to explain this in the protocol template. Hog is still taken when in-block chipping is used. Additional hogging occurs. Many other sources of hog, many not at capacity.

Many – Call “debris” not “slash”

Karen – generalize the certification discussion (ISO certs) in the protocol as the basis for a QA/QC program. Page 8.

Karen – set hog fuel hauling distance. How to determine?  
Use economic distance.

Karen – Will it then vary from year to year?

Many – Yes. Where we have records we know where hog was taken.

KK – This is captured in the dynamic approach we are now taking for transportation.

Karen – This should be included in the discussion around conservativeness in the calculations.

Essential to include objective evidence of hours and fuel use (in the protocol, and in the quantification).

Karen – Address biomass to fuel / direct reduction as co-implementation in protocol doc.

KK – would this then move the linkage to the flexibility mechanism section? Because not all who use this protocol may have a co-gen?

Karen – yes. In the protocol template for sure.

Karen – Be more specific in how the 19.6% was derived.

KK – Will cite the document. Can include it as an appendix?

FB – Bowater in Thunder Bay may still chip hardwood. Contact Ray Markham 807-475-9491 to confirm.

RV – Mill yard clean-up with in-block chipping. Why include?

For completeness.

RV – Transportation speed? What would we use?

KK – We had used 60km but this is for the manual calculation only. It was removed to be more generic.

Others would have different average speeds. This is not an issue if Patchworks is being used.

Many – the average speed would be different for different operators and road networks. Needs to account for wait times.

RV – Are we using a loaded truck or a empty one in the calculations?

KK – We are using a loaded truck for time calculations in the interest of conservativeness.

Many – timelines?

KK to update the TPP and TSD with these changes and with edits in track changes from MM, SE, and RV.

KK – Get out early next week?

Yes

MM – don't delay of the format to the protocol doc using the provided template. KK to have the protocol doc ready by the 14<sup>th</sup> of Sept.

## **Expert Technical Review Committee Member Biographies and Meeting/Conference Call Minutes:**

### ***Protocol for quantifying direct reductions in greenhouse gas emissions arising from change(s) in forest harvesting practice***

#### **Expert Technical Review Committee Members**

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Milo Mihajlovich, RPF – Incremental Forest Technologies Ltd.; Project Lead and principal author of the TSD, TPP and protocol;

Kevin Kemball, P. Biol. – Incremental Forest Technologies Ltd.; Technical writer and editor of the TSD, TPP and protocol;

Samuel Elkins, RPT, PEA – Continuous Improvement Coordinator, Peace River Pulp Division; Company Project Leader;

Tim Barker, RPF –Business Team Leader, Peace River Pulp Division; Technical Support;

Robert Volkmann, RPFT – JEDROC Consulting Services Ltd.; Protocol Technical Reviewer;

Dave Blackmore, RPF – Executive Director, Woodlands Operational Learning Foundation; Protocol Technical Reviewer;

Juri Agapow, RPFT – Forest Operations Extension Specialist, FPIInnovations; Protocol Technical Reviewer;

Frazer Butt – Lead, Forest Planning and Performance Monitoring, AB Sustainable Resource Development; Protocol Technical Reviewer;

Karen Haugen-Kozyra – Principal, KHK Consulting; Protocol Technical Reviewer; and,

Tanya Maynes – Program Manager at Climate Change Central facilitated development of this document.

## Milo Mihajlovich, RPF 0076 (AB)

### Education

Bachelor of Science (Forestry), (1976 – University of Alberta)

### Recent Project Experience:

- Greenhouse Gas Emission Reduction Strategies in Forestry: Provide technical background to support the forest industry and Alberta Sustainable Resource Development in making informed, strategic decisions in engaging the emerging “carbon” economy.
- Capital Power Afforestation Project: Assess reclaimed and unused lands on the Capital Power Genesee mine site for afforestation potential. Develop and implement afforestation prescriptions and plans to create intensively managed plantations and plant communities resembling “typical parkland” vegetation.
- Review CEMA Revegetation Manuals: Review CEMA Upland and Riparian Revegetation Guides. Provide guidance on how to better integrate ecological concepts with operational practice.
- Application of Wet Areas Mapping to Silviculture: Assisted in applying a LiDAR based wet area identification tool to silviculture practice. Developed a silvicultural optimization model that has the potential to reduce silvicultural accruals by \$1/m<sup>3</sup>.
- Calibration of Spray-Advisor Decision Support Tool for Canada: Western Canadian representative on an international team calibrating a spatially explicit spray cloud behavior model for forestry herbicide and pesticide applications.
- Mixedwood Management Association Silviculture Field Guide: Lead member of a technical “SWAT” team working with a steering committee of association members to develop a three-tiered science based manual for silviculturists practicing in the western boreal forest. Emphasis is on providing practitioners an accessible, quantitative, science-driven approach.
- Vegetation Management Process – Duke Energy (now Spectra): Developed a threshold based, quantitative vegetation assessment and prescription process for pipelines in northeastern British Columbia. Focus was on use of vegetation management to foster compatible plant communities with minimal intrusion.
- Millar Western Forest Products Ltd. Silviculture Manual: Lead member of a team developing an ecosite-driven silviculture manual. Link quantitative, silviculture practice with the strategic management planning (both strategic fiber supply and landscape level biodiversity modeling.)
- Canadian Forest Service – University of Alberta – Judy Creek Mixedwood Management Trial: Operations manager for trial establishment and maintenance. Participated in trial design and funding acquisition. Participant in evaluation and reporting of this large scale, replicated trial examining a mixedwood by design approach to silviculture.
- Canadian Forest Products Ltd. Silviculture Manual: Partner in developing an edatope driven silviculture practice linking site quality and forest management planning by targeting silviculture activity toward specific yield groups assigned by the detailed forest management plan.

## **Background Courses Include:**

Instructor – AAFMI, SIBC – Advanced Silviculture Modules  
Mixedwood Growth Model Workshop – April, 2005  
Integrated Forest Pest Management – CFS, GLFC  
Effective Technical Writing – McLuhan Institute  
SAS – STATS Graphics

## **Publications:**

- **2009** – D. Pitt, P. Comeau, W. Parker, S. MacPherson, A. Stinson, and **M. Mihajlovich**. 2009. The Role of Herbaceous Vegetation Control in Managing Reforestation of Mixedwood Sites. *Can. J. For. Res.* (in press)
- **2004** – **M. Mihajlovich** and P. Blake. 2004. An Evaluation of the Potential of the Herbicide Glyphosate for Woodland Caribou Habitat Management. *Alces* 40: 7-11.
- **2004** – D. Pitt, **M. Mihajlovich** and L.M. Proudfoot. 2004. Juvenile Stand Responses and Potential Outcomes of Conifer Release EFFORTS ON Alberta's Spruce-Aspen Mixedwood Sites. *For Chron* 80(5): 583-597.
- **2004** – **M. Mihajlovich**, D.G. Pitt and P. Blake. 2004. Comparison of Four Glyphosate Herbicide Formulations for White Spruce Release Treatment. *For Chron* 80(5): 608-611.

## **Recent Technical Presentations:**

- 2009 – Spray-advisor Operational Introduction – introduce spatially explicit version of Spray-advisor to forest company sponsors and Alberta Department of Sustainable Resource Development.
- 2008 – Member Spray-Advisor Technical Development Team, May, Canadian Forest Ecology Center, Mattawa, On.
- 2006 – Imazapyr Technical Transfer Sessions for Foresters and Applicators, Whitecourt, AB. October.
- 2005 – The Potential of Imazapyr Herbicide for Mixedwood Site Preparation – Eastern Canadian Vegetation Management Alliance, Kingston, On. October.
- 2005 – Role of Competition in Regeneration Standards. Alberta Forest Research Institute – Technical Workshop, Edmonton, Ab. MARCH.
- 2005 - Juvenile Stand Responses and Potential Outcomes of Conifer Release EFFORTS ON Alberta's Spruce-Aspen Mixedwood Sites. Canadian Institute of Forestry – Rocky Mountain Section – Technical Session.
- 2005 – Linking Early Stand BIOLOGY TO Growth and Yield. Ontario Ministry of Natural Resources Technical Workshop. Toronto, On. January.

## **Employment:**

**Incremental Forest Technologies Ltd.**, Edmonton AB Oct 1996 – present

A platform for a consulting practice focusing on greenhouse gas capture and storage in trees, post-establishment silviculture, linking strategic planning and silviculture, vegetation management process development, and First Nations forestry.

**Ace Vegetation Control Service Ltd.**, Nisku AB

Mar 1994 – Oct 1996

Manager of forestry services – responsible for creating and managing a \$3MM per year forest vegetation management contracting business.

**Primary Industries – Forestry**, Kuitpo Forest, SA Sept 1993 – Jan 1994  
Vegetation Management Forester responsible for reviewing and revising herbicide use prescriptions and practices in plantation establishment and management across South Australia.

**Conservation and Land Management**, Perth, WA Jun 1993 – Sept 1993  
Evaluate potential for use of Portuguese shore pine (*Pinus pinaster*) for remediation of salinated farmland in northern (hotter, drier) wheat belt of Western Australia. Develop establishment vegetation management regimes for blue gum (*Eucalyptus globulus* var. *globulus*) on salinated land in central and southern wheat belt of Western Australia.

**DowElanco Australia Ltd.**, French's Forest, NSW Mar 1992 – May 1993  
Roving technology development person – assisted with product evaluation and development in cotton, small grains, legumes, and woody weed control.

**DowElanco Canada Inc.**, Newmarket, ON Sept 1988 – Jan 1992  
Senior development forester for Canada focusing on product development and support in forestry and industrial vegetation management markets.

**Dow Chemical Canada Inc.**, Sarnia, ON Jan 1982 – Sept 1988  
Senior research agronomist for western Canada managing five research stations located near Edmonton, Lethbridge, Regina, Saskatoon and Winnipeg.

**Alberta Forest Service**, Edmonton, AB Aug 1978 – Sept 1981  
Provincial reclamation specialist working to introduce native plant species into reclamation of coal mined land in East Slopes. Participate in oversight of Alberta Oil Sands Environmental Research Program. Manage operational reclamation of abandoned industrial sites throughout the Green Zone.

**Alberta Forest Service**, Slave Lake, AB Apr 1976 – Aug 1978  
Assistant forester – silviculture focused on planning, implementation and record-keeping x operational silviculture on a large scale. Work to introduce a post-harvest silvicultural assessment system for prescribing and planning reforestation activities.

## **Kevin Kemball B.Sc., M.Sc. (F), Ph.D., P.Biol.**

Kevin has a background in biology (B.Sc.) and forestry (M.Sc.), and a Ph.D. from the Department of Botany at the University of Manitoba. Kevin has 15 years of experience working in the boreal forest and has been a consultant in Alberta for 5 years. Prior to starting work in Alberta, Kevin was a lecturer at the University of Winnipeg for *Forest Ecology, Forest Policy and Management*, and *Forest Ecosystems* courses. In addition to his graduate work on insect, fire, and logging impacts on forest succession, Kevin has initiated and or supervised numerous research projects, participated in international conferences, and published several peer reviewed papers.

Within the past two years Kevin has managed and coauthored the Alberta Silviculture Guide: Boreal Mixedwood and Lower Foothills Natural Subregions for the Alberta Mixedwood Management Association, the Vegetation data synthesis in the Athabasca oil sands region report for the Cumulative Environmental Management Association (CEMA) and the Draft Riparian Classification and Reclamation Guide for Suncor Energy and Shell Albian Sands that is currently undergoing peer review for acceptance as a CEMA approved manual.

## Samuel B. Elkins, RFT(AB), PEA

Samuel Elkins has over 15 years of Natural Resource experience spanning across Alberta, British Columbia, and New Brunswick and has worked in various industry, consulting, and government positions. He has extensive experience and training in many aspects of technical, operational, and administrative practices related to the natural resources sector including forest operations, management systems, sustainable forest management, chain of custody certification, health & safety and commercial transportation. He holds designations as a Professional Registered Forest Technologist (RFT) and a Provisional Environmental Auditor.

Samuel has experience conducting management system audits and implementing certification projects including: ISO 14001 and 9001, (CAN) CSA Z-809, Alberta FORESTCARE, Program Endorsement for Forest Certification (PEFC) Chain of Custody, and FSC Controlled Wood Chain of Custody certification schemes. In addition, he has conducted numerous regulatory compliance audits in British Columbia and Alberta in both the forestry and oil and gas sectors, and develops health, safety, and environmental programs for various industry sectors.

Samuel also has been part of the implementation of the **Canadian Boreal Forest Agreement** as a Caucus Member and participates on two National Working Groups including:

- **Canadian Boreal Forest Agreement National Working Group: Goal 1-Forest Practices:** Provide a World-leading boreal “on-the-ground” sustainable forest management practices based on the principles of ecosystem based management, and third party verification.
- **Canadian Boreal Forest Agreement National Working Group: Goal 4-Climate Friendly Practices:** Reducing greenhouse gas emissions along the full life cycle from forest to end of product life.

Samuel is also involved with various biologically – based carbon offset opportunities under the Alberta Offset System including protocol and project development, as well with the North American Forest Carbon Standard development initiative. Experience to date include (but are not limited to):

- **North American Forest Carbon Standards Committee-** this effort is to develop a bi-national standard to measure carbon from forestry activities that is environmentally sound, scientifically based, and economically feasible.
- **Direct Carbon Reduction Protocol Development-** Company Project Leader. Protocol and subsequent project plan will quantify GHG emission offsets arising from a change in forest harvesting practice from whole tree logging with chipping at the mill site (Baseline Condition) to in-block chipping using portable chippers under the Alberta Offset System.
- **Afforestation Protocol Review Committee**

## **Robert Volkman, CRSP, PMP, RFT (BC & AB), EP (CEA), EP (TECH)**

Robert Volkman has over 30 years of natural resources experience in British Columbia and Alberta. He has worked in various industry, consulting, and government positions. His experience is broad and includes many aspects of technical, operational, and administrative practices related to the natural resources sector. He holds designations as a Registered Safety Professional, Project Management Professional, a Professional Registered Forest Technologist (B.C. & Alberta), an Certified Environmental Auditor (Sustainable Forest Management), and a Certified Environmental Practitioner (Forestry, Natural Resources Management, Management for Sustainable Development) .

Robert Volkman recently worked as Forest Practices Manager Audits & Investigations with the B.C. Forest Practices Board. As project manager/team leader/lead auditor, he planned and completed audits and special projects in the areas of Code/FRPA compliance, Code enforcement, and evaluating effectiveness of practices relating to forestry, oil & gas, and range activities. These projects involved planning/organizing, supervising other professionals, analyzing, and reporting findings for audits and investigations in various locations around B.C.

### **Related Projects (B.C.) with links:**

[Road and Bridge Maintenance Obligations](#) (on-going)

[Cumulative Effects Assessment of the Kiskatinaw Planning Unit, Dawson Creek, BC](#) (on-going)

[Audit of Forestry, Range and Oil & Gas Activities near Dawson Creek](#) (on-going)

[Audit of Forest Planning and Practices within the Penticton and Mission Creek Community Watersheds](#) (focus on water quality & soil conservation)

[Audit of Timber Harvesting and Associated Planning: Western Forest Products Inc.- TFL 6](#) (focus on wind throw with respect to riparian & wildlife features)

[Pilot Audit of Soil Conservation in the Columbia Forest District](#)

[High Retention Harvesting and Timber Sustainability on the British Columbia Coast](#)

[Fish Passage at Stream Crossings](#)

[Fire Hazard Assessment and Abatement](#)

[Audit of Sunshine Coast licensees](#) (focus on road & harvesting practices)

[Wind throw on West Island Timberlands](#)

[Area-Based Audit of Forest Planning and Practices, and Enforcement of the Forest Practices Code in a Portion of the Merritt Forest District](#)

He has been involved in certification projects within Alberta including ISO 14001 Environment Management Systems, FORESTCARE, CSA Z809-02 Sustainable Forest Management Systems, Forest Stewardship Council Chain of Custody and Compliance Auditing for Daishowa-Marubeni International Ltd.

Most recently he has successfully completed the ISO 14064 series of courses:

- ISO 14064-1 Essentials: Greenhouse Gas Inventories
- ISO 14064-2 Essentials: Reducing Your Organizational Environmental Impact
- ISO 14064-3 Greenhouse Gas Verification (achieved Certificate of Completion)

## Dave Blackmore, B.ScF, RPF 0036

### Education

Bachelor of Science (Forestry), (1979– University of Alberta)

### Management and Organizational Skills:

As an experienced and successful manager in government, college, not for profit and industrial applications, I have a broad understanding of both project management and the management cycle; plan, budget, staff, produce and review. Manage the staff to complete these complex tasks within cost, on time, with accurate reports, in an ethical environment. No problem!

### Communication Skills:

Superior communication skill keeps employees on mission, the Board and other managers informed, your image strong and customers in your pocket. Training in advanced communications, public speaking, meetings, supervision, leadership, motivation, adult education, technical writing and selling, with plenty of practical experience, has made me an exceptionally skilled communicator whether developing a complex proposal or instructing.

### Technical Skills:

Whether manufacturing and marketing complex electronic over hydraulic forest harvesting machines or managing GST between a not for profit and a college, the devil is in the technical details. I have the ability to quickly understand the constraints or opportunities from technical knowledge. I have operated a virtual office for five years, so have a working knowledge of most MS Office functions as well as internet research skills.

### Relevant Employment:

#### Woodland Operations Learning Foundation

08/11/04 to Present

Executive Director

#### Four forestry equipment manufacturers

01/10/87 to 07/11/04

Territory Manager

Marketing Manager

Dealer Manager

General Manager

#### Alberta Forest Service

06/79 to 01/10/87

Silviculture Forester

Land Management Forester

Regional Reforestation Forester

## **Juri N. Agapow, B.ScF For Eng., RPFT**

Juri Agapow graduated from the University of Applied Sciences in Rottenburg A.N., Germany with a degree in Forest Engineering in 1996. He is also an Alberta Registered Forest Professional.

After 4 years of self-employed forestry contracting and consulting work in Servance, France, he and his family immigrated to Peace River, Alberta in 2000, where he first worked in the oil & gas sector.

In spring 2002 he joined the woodlands team of the Daishowa-Marubeni International Ltd. Peace River Pulp Division (DMI), where he worked in various positions ranging from Tree Improvement Forester and Operations Supervisor to Private Land / Salvage Wood Coordinator and Planner, which enabled him to get a thorough understanding of DMI's entire woodlands operations.

In fall 2006 he accepted a job offer with FPInnovations (formerly FERIC – Forest Engineering Research Institute of Canada) as the Forest Operations Extension and Technology Transfer Specialist for Alberta, which meanwhile also includes the Yukon and Northwest Territories.

He is also the initiator and co-founder of the newly inaugurated Weberville Community Model Forest and the current President of the Weberville Community Forest Association.

Juri's personal forestry-related fields of interest and expertise evolve around three main pillars: Private Woodlot Management, GIS and Bioenergy from woody feed-stocks.

He initiated the FPInnovations Annual Bioenergy Conference Series in 2007, which has earned national and international recognition throughout the industry, and takes the lead on most of FPInnovations' bioenergy related extension activities in Western Canada anywhere from Saskatchewan to the Yukon Territories.

Juri has been involved in the creation and review of various forestry-related environmental policies, field guides and best management practices anywhere from a company to a national level as well as the building of business cases around bioenergy and carbon offsets on a community level.

He currently lives with his wife and 2 daughters on a farm North of Peace River.

## **Frazer Butt, RPF**

My name is Frazer Butt. I have a Bachelor of Science degree in forestry and a Registered Professional Forester in the province of Alberta. I am currently employed with the Government of Alberta (Sustainable Resource Development) in the Forest Planning Section as a Forest Planner.

As a Forest Planner I work with a number of forest companies across the province during the development of Forest Management Plans. I am the government contact for planning related issues, which arise during the planning process. My main job duties include participating on forest management teams to assist in the development of Forest Management Plans, coordinating other government specialists to assist in the planning process and to track / monitor post approval conditions.

Prior to working for the Government of Alberta, I was employed by a large forestry company in northwestern Ontario. The company operated a conifer sawmill and a pulp and paper mill. During my 7 years with the company I held various positions, including silviculture assistant, area / operations forester and area supervisor. My positions were mainly field related and involved daily interaction / supervision of both tree length and field chipping operations. My responsibilities covered all aspects of forestry from planning and harvesting of cutblocks, monitoring of field chipping and tree length operations and deliveries, budgeting for road development, silviculture activities, compliance reporting and environmental management systems / certification.

## Karen Haugen – Kozyra

Born in Edmonton, obtained Biological Sciences Diploma from NAIT, BSc in Plant Sciences and MSc in Soil Microbiology and Biochemistry from the University of Alberta

Between 1991 and 1997, ran KHK Consulting out of her home office, contracting with federal, provincial and university agencies.

For 13 years after that, Karen served in various sustainable policy, planning and technical positions within the Dept of Agriculture and Rural Development. She held the Environmental and Land Use Policy Member position with the Department and spent 8 of those years working at a national level, shaping carbon market policy and quantification protocols for the agriculture sector.

From 2007-2009, Karen was seconded to Climate Change Central, a not-for-profit established by the Government of Alberta. There, she implemented the necessary market processes, infrastructure and tools needed to get the Alberta Carbon Offset Market off the ground. In that role, Karen and her Team leveraged the previous carbon offset national work to help build sound policies, quantification protocols, tools and infrastructure needed to facilitate the development of a Carbon Offset Market in Alberta.

Currently, Karen is back at KHK Consulting working with various groups and governments in the US and Canada, including the Government of Saskatchewan, as they build key elements of the Saskatchewan Offset System.

Karen is an active member of the Alberta Institute of Agrologists.