

# DEVELOPING A NITROUS OXIDE REDUCTION PROTOCOL: SCIENCE AT WORK

October 27-29, 2008



CANADIAN FERTILIZER INSTITUTE  
INSTITUT CANADIEN DES ENGRAIS

Nourish

Replenish

Grow

Delta Airport Hotel  
Calgary, AB

## BACKGROUND

Carbon credits or “offsets” generated from the agriculture sector are currently a compliance option for large greenhouse gas (GHG) emitters in Alberta and also under the Federal “Turning the Corner” Climate Change Plan. In the Alberta 2007 compliance period, over 600,000 tonnes of agricultural offsets were created, verified and used for compliance purposes by regulated entities. **Government approved Quantification Protocols are a requirement under both systems for creating compliance-quality offsets.**

Climate Change Central is coordinating protocol development and review on behalf of the Government of Alberta. Part of their mandate is to promote made-in-Alberta offset opportunities by creating standardized “quantification protocols” available for producers or other groups who wish to create offset credits for sale in the evolving compliance-based carbon markets in North America. Industry is now called to cost-share in the development of further protocols for the Alberta Offset System, and bring forward ‘base protocols’, reviewed by experts, for consideration.

The Canadian Fertiliser Institute and their partners have identified an opportunity for a new protocol –featuring nitrous oxide reduction activities in Canada. A technical working group, called the Nitrous oxide Emission Reduction Protocol working group (NERP), has committed to providing a standardized protocol, based on the best available science on GHG emission reductions from nutrient management in the Prairies, and potentially for the rest of Canada, to the Alberta Protocol Development Process. The NERP is following the established process for coordinating scientific information and consensus-building according to the ISO 14064-2 GHG Project-Based Standard and past procedures under collaborative Federal-Provincial-Territorial Offset Quantification Team processes.

## PURPOSE

To engage key scientific researchers, technical experts and project developers at home and abroad, to provide advice and agreement on standardized protocols and best available science on GHG emission reductions from practices that reduce nitrous oxide emissions from soils.

The workshop will:

- Focus on and achieve, either during the two-day workshop or through follow-up work, the desired workshop outcomes listed below. These will be used to support the developing Prairie-wide, and perhaps Nation-wide, GHG offset opportunities related to nitrous oxide emission reductions.

- Acceptable GHG reductions that can be confidently advanced for nitrous oxide reduction opportunities according to the identified performance levels;
- GHG reductions that can be achieved with confidence, using the methods identified (with uncertainty ranges).
- Determination of the extent of leakage issues related to the impact of nutrient management practices on other GHGs like CO<sub>2</sub> sequestration and methane, within the ISO 14064-2 framework;
- Discussion on a preferred baseline for each performance level;
- Clear identification of and priority for the areas where research gaps exist and must be addressed.

#### General Process:

- Use a combination of a literature review in the form of a science discussion paper, sharing recent research results, researcher experience and small group discussion with large group evaluation of ideas and recommendations to achieve the workshop outcomes.
- The first day will be spent on understanding the synthesis science; the second day will be active working group sessions where participants work towards consensus on proposed options for quantification science and links to management performance levels.

## RECEPTION – OCTOBER 27, 2008

7:00 - 9:00 PM

### Workshop and Reception Location: Delta Calgary Airport

2001 Airport Road NE  
 Calgary, Alberta, T2E 6Z8  
**Phone:** 1-403-291-2600

**Reception:** William Avery Bishop Room  
**Workshop Location:** McCall Ballroom

## AGENDA – OCTOBER 28, 2008

9:00 – 4:30 PM

### Focus for the Day

Bring all participants to a common level of understanding regarding policy context, IPCC, Canada's National Inventory Reporting procedures and measurement upon which Nitrous Oxide emission reductions are or will be based.

Day One will provide an opportunity to learn about the current policy, quantification and inventory methodologies, and will suggest proposed options for the best available quantification approaches for a Protocol. The focus will also be on management practices/performance available to producers, and their links to the quantification science.

- 8:30    **REGISTRATION AND CONTINENTAL BREAKFAST**
- 9:00    **WELCOME AND INTRODUCTIONS** – Review and Confirm agenda  
*Karen Haugen-Kozyra, Climate Change Central*
- 9:15    **SETTING THE SCENE** – Carbon Offsets and the Policy Drivers  
*Bob Savage, Alberta Environment*

- 9:45 **HOW IN THE WORLD ARE WE DOING THIS? - ISO 14064-2 Framework; Protocol Development Approaches**  
*Karen Haugen-Kozyra, Climate Change Central*
- 10:15 **HOW DO WE STACK UP VIS AVIS THE REST OF THE WORLD? – IPCC Methodology and International Guidance on Nitrous Oxide Reduction; Canada’s Quantification Approach**  
*Reynald Lemke/Philippe Rochette, AAFC*
- 11:00 **REFRESHMENT BREAK**
- 11:15 **WE’RE NOT STARTING FROM SCRATCH – Part 1 – Framework for a Nitrous Oxide Reduction Protocol**  
*Rob Janzen, ClimateCHECK//Karen Haugen-Kozyra*
- 12:00 **HOT BUFFET LUNCH**
- 1:00 **YOU CAN’T MANAGE WHAT YOU CAN’T MEASURE PART II – Nutrient Stewardship Management Plans and BMPs to achieve them**  
*Clyde Graham, Canadian Fertilizer Institute/Cliff Snyder and Tom Jensen, IPNI*
- 2:00 **WHO’S ON FIRST I? – State of the Science Findings: A Walk-Through of the Discussion Paper; High Level Discussions**  
*Dr. Rob Janzen, Climate-CHECK*
- 2:45 **BREAK**
- 3:00 **WHO’S ON FIRST II? – Framing the Basic Elements of a Nitrous Oxide Emission Reduction Protocol: Setting the Stage for Day Two**  
*Fiona Law, Process Facilitator*
- 4:30 **SUMMARY AND CLOSE OF DAY ONE**  
*Karen Haugen-Kozyra, Climate Change Central*

## AGENDA – OCTOBER 29, 2008

8:30AM – 3:00 PM

### Focus for the Day

Confidently advance GHG protocol recommendations that address the desired components of a N<sub>2</sub>O Reduction Protocol. Day two will engage participants working groups in developing, evaluating and recommending protocol elements for management and reduction of nitrous oxide from Canadian soils.

- 8:00 **CONTINENTAL BREAKFAST**
- 8:30 **WELCOME – Review agenda for Day Two**  
*Karen Haugen-Kozyra, Climate Change Central*
- 8:45 **WHERE DO WE GO FROM HERE: FOCUS AREAS FROM THE SCIENCE DISCUSSION DOCUMENT**  
*Rob Janzen, ClimateCHECK*
- 9:15 **WHERE DO WE GO FROM HERE I? – Break-Out groups –Facilitated by Discussion Guides**  
*Fiona Law, Process Facilitator*

**1. Measurement and Emission Factors Group**

**a. Estimated Emissions – IPCC Tier 1 and Tier 11 Calculations**

*Desired Outcome: Agreement on the combination of IPCC Tier 1 factors and Canada-specific methodology used to quantify N<sub>2</sub>O emissions for the baseline, and estimate emissions for the Project before multiplication by reduction modifiers;*

**b. Gaps in our Understanding**

*Desired Outcome: Agreement on what we need to gain a greater understanding on in the next 5 years, with the goal of developing a Science Plan.*

**2. Practices and Technologies – BMPs to Reduce N<sub>2</sub>O (Simple, Intermediate and Advanced)**

**a. Details on Sampling, Recommended N rates, Right Place, Time and Form**

*Desired Outcome: Based on a Science Discussion Document Table 5, BMP Surveys, Industry knowledge, confirm understanding of the above details..*

**b. Gaps in our Understanding**

*Desired Outcome: What do we need to put in place to get to the desired level of prescription in the Nutrient Stewardship Plan.*

**3. Quantification for NERP Levels**

**a. Details on GHG reduction modifiers and reductions for each level of management sets**

*Desired Outcomes: Determine GHG reductions, with confidence, for each performance level (with uncertainty ranges) and to gain agreement on a preferred baseline to identify potential credits from reduction/avoidance practices.*

**b. Gaps in our Understanding**

*Desired Outcome: Identification of knowledge gaps and required research, industry coordination in this area*

11:00 **BREAK OUT GROUP PRESENTATION OF OPTIONS**

*Fiona Law, Process Facilitator*

12:00 **LUNCH**

1:00 **COMPILATION OF RESEARCH GAPS – SETTING THE STAGE**

*Rob Janzen, ClimateCHECK*

1:30 **IDENTIFICATION OF RESEARCH GAPS – PLENARY**

*Fiona Law, Process Facilitator*

2:30 **USE OF WORKSHOP RESULTS AND NEXT STEPS**

*Karen Haugen-Kozyra, Climate Change Central*

2:45 **WORKSHOP EVALUATION AND CLOSE**