Comments to the USDA White Papers on Agricultural and Forestry GHG Reporting workshops

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INTRODUCTION

Recommended improvements to VGGRP

3) *Support independent verification of registry reports.*

A key requirement for supporting independent verification will be agreed upon and unambiguous *definitions* of the practices being reported, that correspond to the definitions used in the accounting procedures. While these definitions could be fairly broadly-based in order to facilitate the development of accounting roles they need clear definitions. In many cases these can (and, where appropriate, should) be based on already accepted definitions provided by USDA or other organizations. For example, definitions of tillage systems as formulated by CTIC is a logical starting point for defining tillage practices in the reporting. The existing definitions based on residue coverage could be augmented by specifying the types of implements and frequency of use within a small number of tillage 'classes' – e.g. no-till, ridgetill and mulch till, intensive till. Similar definitions for other practices, e.g. what constitutes a winter cover crop?; how should set-asides be classified?; pasture improvement?, etc., need to be defined.

4) Encourage reporting of greenhouse gas intensity

There are some special considerations with respect to agriculture that make this challenging. For many other emissions sources, the intensity measure is relatively straightforward – e.g. CO2/kilowatt-hour for power plants. However, the unit of output that should be used for agricultural production systems is much less clear. The only integrated measures for an entire farm operation are economic – e.g. net returns, and the disadvantages in using such measures to calculate, due to their sensitivity to price fluctuations, are clear. Similar, but somewhat less problematic would be relating emissions to crop production (e.g. tons of yield) – simply shifting to different crops with widely different yield potentials (e.g. corn vs soybean) could potentially be the biggest factor in changing intensity. Another example is setasides, if they have no defined economic output does that imply that their greenhouse gas emission intensity is infinite? For methane reduction projects, it might make sense to relate the emissions to meat or milk output. For improved manure management (e.g. digesters) emission reductions per ton of manure produced could be calculated. In summary, requiring reporting in terms of GHG intensities (sensu GHG emissions/unit output (economic or commodity)) may cause more problems than solutions. Perhaps one can argue that GHG emissions per unit land area is an 'intensity' – at least for soil related emissions and sinks that would be the most straightforward and meaningful measure.

5) *Encourage entity-wide reporting*

If encourage is the operative word, this is fine. However, since most agricultural mitigation options are likely to be organized at a project-level (multiple farms), targeting specific practices, they are likely to not want the additional burden of reporting for activities outside the scope of the project. But as long as comprehensive accounting is not a *requirement* then making available entity-wide reporting should not be an impediment. If there are significant risks for leakage associated with practice-specific projects, then there is a greater need for more comprehensive accounting.

Entity-wide accounting in the sense of a single-farm operation would require accounting and quantification tools that encompass all major sources and sinks of GHG's. At least for N2O and CH4 these would likely have to be based largely on methods such as the IPCC inventory guidelines, in the near term. The significant challenge would be in developing an integrated set of accounting procedures that would incorporate CO2, N2O and CH4 in a fashion that is simple and relatively easy to use for a complex, mixed farming operation. Given time and resource constraints for developing the initial set of accounting tools and guidelines, it might be wise to consider a phased approach. An initial set of guidelines specific to each of the greenhouse gases could be developed in phase I (say over the next year). In principle these *could* be used to do entity-wide accounting, but a more integrated and refined approach that does this better could be developed in a Phase II. An entity (farm) based accounting/quantification approach is similar to the 'Model Farm' approach proposed by the Canadian GHG office. Currently, US researchers within the CASMGS project are collaborating on an informal basis with Canadian scientists in developing a farm-level quantification tool. Scaling from farm to project level, either for whole farm accounting or for specific sets of practices that comprise a project, should not be a problem since it will be simply addition.

TYPES OF POTENTIAL ACTIVITIES

Among those listed are '2. Conserving existing carbon pools…'. Dealing with 'avoided emissions' from the standpoint of carbon stock changes is problematic – this has been hotly debated in the context of avoided deforestation, which was ultimately excluded from the Kyoto process. If specifically defined (e.g. maintaining preexisting conservation tillage), it could be doable – however, establishing credible baselines against which to assess the avoided emissions is problematic.

GEOGRAPHIC BOUNDARIES

It will be essential that clear boundaries be set to avoid double counting or undercounting at the aggregate (e.g. multiple sectors or national level). For agriculture, it seems logical that the accounting boundaries should in most cases be defined as the 'farm gate' – in other words, accounting for emissions that actually occur within the farm boundaries. However, provisions need to be made that include accounting of emission reductions that actually occur outside the farm boundaries. For example, if fertilizer use is reduced, this will lead to a reduction in CO2 costs associated with manufacture and transport of fertilizer. It may be equitable that farmers, who are the ones responsible for changing the practices, get some credit for this, although the reduced emissions will also show up in the accounting for industrial and transportation sectors. Likewise, for farm production of biofuels, the emission reductions in terms of avoided fossil fuel use will be accounted for in other sectors (e.g. energy, transport) in most cases (unless the biofuels are consumed by the producer) but having accounting procedures that encompass biofuel production in agriculture seems desirable (although if farmers are selling them as a commodity then it seems that emission reduction credits *per se* should fall to the purchasers of the commodity). Another example of boundary issues deals with irrigation. If, for example, irrigation pumping uses electric energy (e.g. coal-fired) and a farmer switches to a more efficient, energy-saving propane fueled pumping system, it would represent a 'true' emission reduction, but could either be seen as a reduction or as an emission 'increase' depending on where the accounting boundaries were set.

TYPES OF ACTIVITIES

Whether it is desirable to have well-defined accounting rules or allow flexible protocols. Reliability and transparency are best maintained with standardized, well-defined accounting rules. Ideally these could be fairly broadly and comprehensively designed so that most types of activities could be accommodated. Outside of protocols that are designed to support GHG accounting through direct measurements (e.g. repeated sampling of soil C stocks), simply defining flexible protocols will likely lead to a much less

reliable overall accounting procedure and a lack of transparency – both of which lead to problems of acceptance and credibility which are crucial issues particularly at this stage in the game.

METHODS

In most cases, model-based approaches, utilizing information on the area and conditions under which defined practices are being used, is the most reasonable approach. For CH4 and N2O, it is highly unlikely that any project or entity will undertake a direct measurement approach (with the possible exception of special cases such as methane capture from manure), due to the cost and technological difficulties involved. Allowing for project level direct measurement of C sequestration is feasible and desirable, particularly as a complement to model/practice based approaches. If accounting is to include direct measurements, it will be highly important to develop strict guidelines covering sampling methods and recommended sampling intensity, soil preparation and analytical procedures, resampling design and frequency. Many issues – including what constitutes soil carbon (e.g. < 2 mm sieved fraction?), how to account for or correct for inorganic vs organic C, depth and bulk density determination, etc. – need to be dealt with in order to minimize variability and ensure reliability of the results.

For model-based estimates (i.e. default emission or sequestration rates) it would be feasible to design a system that could capture regional variability (e.g. at the Land Resource Region (LRR) or Major Land Resource Region (MLRA)) as well as the major soil types and management systems that are presently used and/or envisioned in the near future. Simply defining protocols for estimating emission/sequestration factors by individual entities or groups is problematic in that it would lack standardization (and likely in many cases) scientific credibility and would have transparency problems.

COMPREHENSIVENESS

The second option of 'setting *de minimus* quantities for other GHG' is attractive, in that it would avoid problems of possible increases in 'non-target' GHG (e.g. increased N2O emissions associated with a C sequestration project) that would reduce or eliminate the desired benefit to the atmosphere, while not placing added burden on a project or entity to do additional accounting. Guidelines would have to be developed that would spell out where such an option were allowable or make provision for an independent review/certification process to make that determination for specific projects.

LEAKAGE

For many agricultural practices, leakage is not likely to be a major concern, with the main possible exception being leakage associated with land set-aside. Setting the boundaries for leakage is problematic as is the attribution of cause. The most feasible short-term approach may be to attempt to quantify regional default leakage estimates based on the CRP program, using available land use statistics from prior to and after the CRP.