



CLIMATE  
ACTION  
RESERVE

## Soil Enrichment Protocol Draft Version 1.0 Public Comment Webinar Questions & Answers

Question Asked	Answer Given
How many tons of CO <sub>2</sub> is absorbed per acre by crop type?	This will vary considerably due to many factors, including soil conditions, management actions, and climatic conditions. An indicative rough estimate may be something like 0.5-2tCO <sub>2</sub> e/acre.
Is biochar an eligible soil enrichment method?	In short, yes. We think there are probably three ways the GHG impacts of the application of biochar might be accounted for under the SEP: (1) If biochar is applied there may be some impacts with respect to increases in retention of water, nutrients, bacteria, mycorrhizae, which may in turn impact SOC indirectly; (2) Models may be able to estimate GHG impacts of biochar application (though we do not believe this is possible at present); (3) The biochar itself may be picked up in direct soil sampling, and thus represent a direct SOC increase. The latter is something we will need to explore further, as there may need to be restrictions to ensure no double counting with any future biochar protocol, and to account for GHG impacts associated with the production of the biochar.
By decoupling the GHG rights, does that mean that leased farmlands are eligible?	Yes, the intent is to allow leased fields to participate.
Once this protocol is approved for use, will projects developed under this protocol be automatically CORSIA eligible?	We certainly expect the credits to be eligible, but we will be working with ICAO to determine how they want to handle any new protocols.

The verification is a huge improvement over previous iterations.	Thank you. We were hopeful this approach would be more feasible. Appreciate your feedback!
Why not use the models also for the N <sub>2</sub> O?	We allow for modeling or use of default equations for this SSR.
Default EF for let's say direct and indirect N <sub>2</sub> O emissions usable?	Yes.
Can you tell us when the Soil Enrichment Project Development Handbook will be available?	We will likely look to commence development of a handbook once the SEP is adopted.
Is there a risk that proxy sampling and "option" to sample SOC would lead to choice of samples or modelling instead of sampling when it suits the PD (i.e., choice of the highest emission reduction option)?	Yes, I think there is, though arguably that is the case every time a protocol allows for such flexibility. Almost every protocol includes at least some such options. At least every 5 years a direct measurement must be used to estimate SOC.
If a project is 30 years, who will be responsible for the reversal after 30 years?	Project owners are the entity responsible for reversals. In many cases, we expect this to be the aggregator.
Then what happens if the aggregator no longer exists?	The project implementation agreement considers that and includes some relevant terms for assignment and assumption of the agreement. This is also why the risk of financial failure is variable. In these situations, the Reserve would likely have to evaluate on a case-by-case basis how to most appropriately monitor and compensate for reversals.
For SOC modeling, does the protocol require a specific model, such as DNDC or Daycent? Or allows the project developer to select a suitable model or models?	The protocol allows project developers to choose a model, subject to that model meeting the requirements set out in the protocol and in the "Model Calibration, Validation and Verification Guidance for Soil Enrichment Projects".
Is it possible to use % organic matter as a proxy for carbon organic soil using the Van Bemmelen Factor?	The quantification methods are carefully prescribed. If this method is enshrined in a model that meets the protocol requirements, then yes.
Also, is it possible to calculate the average amount of CO <sub>2</sub> sequestered in soil by using soil organic matter percent? I have heard that on average, every 1% increase in organic matter equals almost 1 MTCO <sub>2</sub> e sequestered.	See answer above. I think the simple answer is no, and that more considerations must be taken into account when quantifying SOC under this protocol. Thanks.

<p>How can the GHG rights be appropriately assigned without a deed/title or at least a contract between the landowner and the tenant/leasee?</p>	<p>Ownership is prescribed under each protocol, and should not be assumed to otherwise fall with any given party. Under SEP, we ascribe ownership to the farmer that is farming the land.</p>
<p>How does the project owner establish the baseline conditions/practices?</p>	<p>Baseline is discussed in the presentation, please let us know if you have further questions.</p>
<p>For ongoing monitoring and reporting, if the direct measurement of carbon every 5 years contradicts what was modeled, will CAR adjust the carbon issued during the modeled years, or more likely make adjustment in future years?</p>	<p>Quantification would be trued-up in the reporting period during which direct measurement updates are made.</p>
<p>How do project owners prove baseline activities? They can obviously use records to show fertilizer purchases, etc., but what about proving which methods they were using in the baseline scenario?</p>	<p>Yes, great question. This is always a challenge. See Section 3.4.1.2 where there is a hierarchy of baseline data sources listed. This includes things like actual records (receipts, contracts for labor that can imply specific activities, perhaps equipment rental contracts) and it can extend to attestations from farmers, statements from third parties etc. As always, project developers would be encouraged to seek guidance from the Reserve when in doubt. For the first project(s) we are likely to work very closely with the project developer and essentially tacitly approve and lock in baseline data sources well in advance, and that way also perhaps help verifiers streamline things down the line, so they would essentially rubber stamp that step, and just focus on whether there have been any changes in sources since Reserve approval, and also focus on the actual input values, rather than source, etc.</p>

<p>Do you think you will have problems with reliability in SOC changes?</p>	<p>It is not clear exactly what your question is getting at. We will no doubt see very highly variable rates of changes across the country, for different conditions, not least of which include different management actions, different soil conditions, climatic variability. In terms of whether this method enshrines best available science, we think it does. We think the hybrid mix of modeling and direct measurements will allow us to proceed safely now, using best available science on both modeling/lab testing fronts. The hybrid mix ensures that the most conservative of results across modeling/direct measurement will eventually be reflected in emission reductions. The protocol also ensures models and EFs will be updated periodically, as advances in the science dictate. We also have a very robust uncertainty mechanism, which ensures accuracy/conservativeness are balanced. Overall, we think this represents best practice, and is a reasonable basis on which to proceed.</p>
<p>Farmers have rental or leased lands for 30 years only in an EXCEPTIONAL case. Land ownership is not even stable over 30 years anymore. The 5 year MIGHT work. Have you reviewed land rental and ownership in ANY DETAIL?</p>	<p>Individual fields are able to come in and out of the project. A single field does not have to stay in for the full crediting period, and the project may also end the crediting period early.</p>
<p>Soils are variable. Field boundaries don't recognize soil properties. How can you change fields and ensure verification?</p>	<p>We will be looking at SOC changes over the project as a whole. When a field leaves, it will enter a monitoring period to ensure reversals have not taken place, but other fields entering the project can continue to sequester additional carbon. This will be included in review during verification. Quantification and verification take into account all fields participating in the project, including any fields exiting or entering a given project, with verification including site visits and desk reviews considering all participating fields at the time of verification.</p>
<p>Today's farming realities mean practices can change YEARLY in terms of inputs, tillage, etc. Farmers will not be committed to a 5-year period of no change with today's markets and weather. Will you deal in principles as opposed to defined practices?</p>	<p>Quantification under the protocol is based on practices as they are actually implemented on the ground, but farmers maintain flexibility to change their exact practices from year to year.</p>

<p>Site visits are not realistic for all sites. Why not remote sensing for verification of SOC gains regardless of one change or many in practice in a year?</p>	<p>Verifiers will not be expected to visit all fields, and we do expect there to be some use of remote sensing, particularly during the monitoring period. We will get into verification in more detail later in the presentation.</p>
<p>The combination of baseline monitoring and then crediting means no credible reality for real farmer participation. Your timelines are not realistic. Again, a remote sensing background data set is needed to establish that parameters YOU WANT. Farmers won't have these records without compensation. How much do you for history?</p>	<p>These requirements are fundamental prerequisites for any offset program. We agree that remote sensing applications could be quite useful in the context of such projects. In Section 3.4.1.2 we offer a range of sources for historical data, which are quite flexible, and include things like attestations from trusted third parties such as agronomists or NRCS folks, or proxy regional USDA data can also be used.</p>
<p>Why don't you use accredited soil labs for testing? Farmers use them for their needs. Extra costs heaped on for "flexibility" and "protocol guidelines" are/will kill this.</p>	<p>Thanks, we have added language to the protocol since the release of the public comment draft to direct project owners to use labs with demonstrated proficiency under NAPTP and the Performance Assessment Program under NAPTP.</p>
<p>What happens to the project when one-year results in No seeded acres due to weather or markets? Does it remove all the previous or future credits?</p>	<p>Periods of fallow or otherwise low/no active farming would not likely result in reductions in soil carbon, so should not result in any penalty.</p>
<p>Trusted 3rd parties are not going to add anything but cost in the eyes of farmers. Was there not consideration of crop advisors or agronomists being used by the farm? There is no understanding of the financial margins farmers are attempting to work under shown in this protocol.</p>	<p>Farmers are not anticipated to be the primary actors in such projects, but instead third-party expert project developers are likely to play that central role. Thus, the costs of engaging such third parties would not be borne directly to farmers. Crop advisors and agronomists are likely to qualify as trusted third parties.</p>
<p>Shifting to the project proponent doesn't solve the problem. Farmer will still bear the cost and not trust them. This dog don't hunt.</p>	<p>There are already many farmers, representing millions of acres, that have purportedly expressed an interest in joining such projects, so hopefully that translates to widespread participation. We will continue to explore means to make such projects more accessible to more farmers.</p>
<p>How are GHG reductions measured?</p>	<p>Quantification is discussed later in the presentation, please let us know if you have further questions.</p>

<p>Are there demonstrations lining up to show how this protocol will work on the ground?</p>	<p>There is already some work being done to develop projects, so we hope to have at least one project listed as soon as a protocol is adopted. Indigo Agriculture is already working on a project. That is probably the most immediate demonstration we are likely to get. We never really appreciate how these will work until we get actual projects moving through and trying to implement a protocol.</p>
<p>Farming operations implement various practices in accordance with compliance of the San Joaquin Valley Air Pollution Control District's Conservation Management Practices (CMPs). CMP practices appear somewhat similar to the example Adopted Protocols, are these practices ineligible for project designation due to their "legally required" status as a means of compliance with the CMP requirement through the Air District?</p>	<p>If a specific practice is legally required, then yes, that practice would not be eligible under the protocol. Are the CMPs outcome based, such that a farmer can choose from a suite of practices, any or some combination of which achieve the desired conservation outcome, with no explicit requirement that a given practice be implemented?</p>
<p>Yes, farming operations are provided a list of practices that qualify for CMP inclusion. Some are crop specific such as cover cropping, utilization of drip irrigation, etc.,. Other practices are applicable no matter what crop is grown, but it is up to the businesses' discretion as to which practices will be implemented at the farm. From the quick slide</p>	<p>Hi, thanks for your questions. I think this type of requirement, where there is flexibility in terms of how farmers may implement, is not viewed as something that is mandated as such. Only if a law actually required the specific project activity would such a law result in that activity being ineligible. We can certainly talk through more specific examples if you like.</p>
<p>* I saw, it appears that CMP practices align with the requirements you are presenting for approved projects. Thank you</p>	<p>Thanks. I think this is a nuance that we had not discussed previously. We may follow up with you after having some internal discussions about this.</p>
<p>Not a problem, the CMPs are aimed at reducing emissions associated with agricultural operations among a wide variety of emission sources, and so it seems that your objective fits in line with what the CMPs have been achieving for over a decade. Just let me know where I can help.</p>	

<p>How can you assume that maintained practices for years won't change in the 70 years after? After all, crop mgmt has changed many times over the last 100 years.</p> <p>* 5 yrs that is</p>	<p>We do not assume anything. We allow parties to make an argument that there is no longer a risk or reversal in their given fields, and we assess the information they provide. If practices have been maintained steadily through 30 years of crediting, and then another 5 years after those farmers stop receiving a carbon offset revenue, then in such circumstances we <i>may</i> consider the risk for that specific field to be sufficiently low.</p>
<p>Will you list models that you will allow?</p>	<p>No, we are keeping this open, but essentially we would likely accept any of the major models such as DNDC, Daycent, COMET-Farm, etc.</p>
<p>So, does the aggregator have a 100-year commitment? If so, is it credible that any business has the capability of ensuring a 100-year commitment? Why 100 years?</p>	<p>The default time frame for permanence is 100-years, based on a commonly accepted standard for "permanent" offsets. However, the protocol does build in some alternative approaches to permanence, and does consider the potential for an aggregator to go out of business prior to the end of the 100-year period.</p>
<p>Direct measurement is for SOC only?</p>	<p>Yes, only SOC.</p>
<p>How can GHG rights be appropriately assigned without a deed/title, or at least a contract, between the landowner and the tenant/leasee farmer?</p>	<p>Ownership is prescribed under each protocol, and should not be assumed to otherwise fall with any given party. Under SEP, we ascribe ownership to the farmer that is farming the land.</p>
<p>Is biochar (pyrogenic carbon) made from crop residues acceptable as part of the soil organic carbon?</p>	<p>In short, yes. We think there are probably three ways the GHG impacts of the application of biochar might be accounted for under the SEP: (1) If biochar is applied there may be some impacts with respect to increases in retention of water, nutrients, bacteria, mycorrhizae, which may in turn impact SOC indirectly; (2) Models may be able to estimate GHG impacts of biochar application (though we do not believe this is possible at present); (3) The biochar itself may be picked up in direct soil sampling, and thus represent a direct SOC increase. The latter is something we will need to explore further, as there may need to be restrictions to ensure no double counting with any future biochar protocol, and to account for GHG impacts associated with the production of the biochar.</p>

<p>How does the protocol ensure N<sub>2</sub>O and CH<sub>4</sub> modeled estimates are robust without any measurement?</p>	<p>Models employed for project reporting must satisfy the requirements outlined in Section 6.5 of the protocol, as well as the modeling validation guidance contained in the “Model Calibration, Validation, and Verification Guidance for Soil Enrichment Projects” document included in the webinar handouts.</p>
<p>For farms with more variable management practices, is the error around the mean of practice use factored into the risk number generated from modeled GHGs (whether historical or future)?</p>	<p>I do not quite follow your question. Can you perhaps rephrase or reach out to talk this through? Alternatively, your answer may lie in the voluminous guidance in Appendix D. Please do feel free to reach out to talk this through.</p>