THE INTEGRITY COUNCIL
FOR THE VOLUNTARY CARBON MARKET

OBSERVATIONS IN RELATION TO CATEGORY ASSESSMENT

SUSTAINABLE AGRICULTURE

OCTOBER 2025

1. Purpose of these observations

The Governing Board (the Board) of the Integrity Council for the Voluntary Carbon Market (ICVCM), when considering the assessment of methodologies related to Sustainable Agriculture identified that it would be beneficial to make available the ICVCM's observations for the purpose of supporting the future development of methodologies in this Category.

These observations are non-binding and do not impact or form any part of the Assessment Framework, Assessment Procedure, or any Decision (as defined under the Assessment Framework) and are published by the ICVCM for the purpose of information only.

The ICVCM may, from time to time, publish other observations for other Categories where it considers this may be useful for CCP-Eligible Programs and other stakeholders, and may update and revise its observations from time to time based on further assessment processes or information. Observations are not an exhaustive set of views of the ICVCM, and not all aspects addressed in assessment processes are included. No reliance may be placed on observations, as they are for the purpose of information only, and observations published are without prejudice to other ongoing assessments.

The Governing Board would like to express its gratitude to the experts and other stakeholders engaged in the assessment process who provided input to the ICVCM regarding this Category.

2. Category Details

The Sustainable Agriculture category focuses on cropland[1] and/or grazing land management[2] practices that reduce greenhouse gas (GHG) emissions and enhance Soil Organic Carbon (SOC) sequestration. Carbon is sequestered in soil when inputs exceed losses from decomposition and runoff. This is achieved through practices that increase organic matter and protect existing soil carbon stocks. Key examples include reduced tillage and improved residue management, crop rotation, improved grazing activities, optimized fertilizer use, and improved water/irrigation management. Each practice varies in its impact on GHG reduction and/or carbon sequestration, and methodologies may allow crediting for multiple practices.

[1] The system of practices on land on which agricultural crops are grown and on land that is set aside or temporarily not being used for crop production. Source: IPCC Good Practice Guidance for LULUCF – Glossary.

[2] The system of practices on land used for livestock production aimed at manipulating the amount and type of vegetation and livestock produced. Source: IPCC Good Practice Guidance for LULUCF – Glossary.

3. Observations relating to Sustainable Agriculture methodologies

The Governing Board's observations regarding the assessment of Sustainable Agriculture methodologies against the ICVCM Assessment Framework and its Core Carbon Principles generally relate to robust quantification, additionality and permanence.

The two methodologies within this Category to which these observations relate are:

- U.S. Soil Enrichment Protocol version 1.1 applied under CAR.
- VM0042 Improved Agricultural Land Management version 2.2 applied under VCS.

The remaining methodologies in this Category remain under assessment by the ICVCM.

3. Robust Quantification

Ensuring the robust quantification of greenhouse gas (GHG) emission reductions or removals is fundamental to upholding the integrity of the voluntary carbon market. Robust quantification requires the use of conservative, comprehensive approaches and sound scientific methods.

ICVCM notes that clear procedures for soil sampling and model calibration are critical to reducing measurement uncertainty and achieving accurate carbon quantification in soil. Both CAR U.S. Soil Enrichment Protocol v1.1 and Verra's VM0042 v2.2 provide detailed guidance on model calibration, sample design, minimum sampling depth (i.e., 30 cm), laboratory selection and soil collection protocols for the eligible Soil Organic Carbon (SOC) measurement techniques within each methodology – in alignment with ICVCM requirements for robust quantification.

The ICVCM notes that the CAR U.S. Soil Enrichment Protocol version 1.1 incorporates grazing and livestock activities within project design. The protocol mandates verification of grazing-related data – including animal type and stocking rate – especially when methane (CH_4) modeling is involved, to ensure appropriate data use and account for uncertainty. While general sensitivity analysis requirements are included, these measures alone may not sufficiently address uncertainties arising from variability in animal counts, types, sizes and other factors. The Governing Board, therefore, approved CAR U.S. Soil Enrichment Protocol v1.1 with the condition that only practices excluding rotational and/or intensive grazing and livestock management are eligible.

Verra, (VCS) VM0042 version 2.2 permits the use of a range of techniques for measuring Soil Organic Carbon (SOC) content. Where the uncertainty of SOC content is known, per the methodology, the dry combustion technique (Dumas method) should be used. In addition, the methodology allows for the use of several proximal sensing techniques, including infrared spectroscopy (encompassing near infrared (NIR), visible near infrared (Vis-NIR), and mid-infrared (MIR)), laser-induced breakdown spectroscopy (LIBS), and inelastic neutron scattering (INS, also referred to as neutron-stimulated gamma ray analysis or spectroscopy). Criteria for the application of infrared spectroscopy, LIBS, and INS are detailed in Appendix 4 of the methodology, which ensures that the most suitable measurement technique is applied. In cases where these techniques are provably unavailable, alternative methods such as Walkley-Black (wet oxidation) and loss on ignition (LOI) may be applied.

ICVCM also notes that Verra (VCS) VM0042 version 2.2 introduces the option to estimate and monitor Soil Organic Carbon (SOC) stock changes using remote sensing through Digital Soil Mapping (DSM), with requirements and procedures set out in the VCS tool VT0014 Estimating Organic Carbon Stocks Using Digital Soil Mapping. Inclusion of DSM as a new SOC measurement technique occurred in the final stages of the ICVCM assessment process, and as such, the ICVCM was unable to complete evaluation of this technique prior to the Governing Board consideration. Consequently, the Governing Board did not grant approval of DSM as a measurement technique in this Decision.

The Governing Board notes the potential benefits of adopting digital Measurement, Reporting and Verification (dMRV) approaches, as a means to enhance the measurement, quantification, and verification of voluntary carbon market projects and activities. These technologies may contribute to more accurate emissions measurement, transparent reporting, and effective project validation. The use of technology-driven methods may also help reduce human error, streamline project verification, and support the timely issuance of credits, which can enhance the efficiency and credibility of the market.

5. Additionality demonstration and Baseline determination

Additionality is a central concept for the carbon market. Emission reductions from a Sustainable Agriculture project are additional if the project activities would not have taken place in the absence of the carbon project. The ICVCM recognizes the tight interdependence between demonstrating additionality – particularly by showing that implemented practices are not common – and establishing the baseline within the Sustainable Agriculture category.

The ICVCM notes that CAR U.S. Soil Enrichment Protocol version 1.1 applies a Performance Standard Test based on a list of specific activities by location within the United States (U.S) that are deemed to be non-additional by default. This negative list identifies specific agricultural practices as non-additional if they are adopted on 50% or more of the land within a county[3] based on U.S. Department of Agriculture National Agricultural Statistics Service (USDA NASS) data[4].

During assessment, ICVCM identified that CAR's 50% threshold for common practice is higher than typical benchmarks (e.g., such as the 20% used in Verra (VCS) VM0042), but it reflects an approach tailored to U.S. territories, to which the protocol is limited. By relying on official, granular, and regularly updated county-level data, this approach addresses common data challenges – such as aggregation inconsistencies, limited sources, and lack of standardization – reducing data uncertainty and avoids that practices widely adopted in specific localities are credited, even if they are significantly less common at broader regional or national scales.

It is commonly understood that combining, or stacking, different sustainable agriculture practices can generate synergistic effects on Soil Organic Carbon (SOC) beyond the sum of individual contributions. For example, integrating no-till with cover crops and compost can

[3] A county is a small administrative subdivision of a state within the U.S.; there are currently 3,144 counties.
[4] More information at USDA - National Agricultural Statistics Service Homepage.

enhance soil structure, increase root depth, and promote microbial diversity, resulting in both short- and long-term Soil Organic Carbon (SOC) accumulation.[5]

The ICVCM considered the potential risk of overestimation when stacked practices include elements that are already common practice, but isolating and modeling the effects of individual practices within combined interventions remains methodologically challenging, especially when soil and weather conditions (e.g., drought) interact with the practices and impact soil carbon enrichment.

In recognition of this challenge, CAR's protocol allows the combination (stacking) of two or more eligible practices that are implemented during the initial year of reporting but none of the individual practices must be on the common practice negative list as mentioned above.[6]

The ICVCM notes that Verra's VM0042 version 2.2 methodology also allows project developers to consider the combined adoption of practices for both the common practice threshold assessment and quantification. The methodology restricts combined practices to those implemented on the same field/management unit in the same baseline crop rotation cycle – or a minimum of three years where crop rotation is not implemented. If the combined adoption exceeds a 20% threshold or data is unavailable, project proponents are permitted to provide verifiable evidence to prove the combined practice is not common and is therefore additional.

Verra (VCS) VM0042 version 2.2 sets the baseline scenario based on the continuation of pre-project agricultural land management practices, in addition to current market trends, government policies, legal requirements, socioeconomic conditions, and technological developments within the agriculture sector. Baseline practices are established to mirror those implemented during the historical look-back period, resulting in an annual schedule of activities to be repeated throughout the initial baseline period. It is also noted that the baseline must be reassessed every ten years to reflect current regional agricultural production, which is a reasonable timeframe for the sector. However, where data availability or changes in production practices warrant, a five-year reassessment is preferable, and this is enforced in the methodology.

CAR U.S. Soil Enrichment Protocol version 1.1 also uses historical data as input to estimate baseline SOC and GHG emissions. Baselines are reassessed at the start of each ten-year crediting period. Additionally, SOC levels must be measured at least every five years to model changes in baseline SOC stocks over time. ICVCM notes that the protocol presents two different approaches for baseline setting, Blended Baseline and Matched Baseline. The Blended Baseline approach is applicable for all cases and represents all possible cultivation options from the historical baseline period, averaged together. The alternative, Matched Baseline approach, is optional and may only be applied if the project maintains the same crop rotation as in the historical period, or if introduces crops where the baseline scenario would have been fallow. It establishes parity between the project's crop rotation and the baseline crop rotation, as defined by the historical baseline period.

[5] More information at Paustian et al, 2019, Jaziri, et al, 2022& López i Losada et al, 2025..
[6] More information at CAR Errata and Clarifications to Soil Enrichment Protocol.

Regardless of the method to establish the baseline, ICVCM notes that baseline setting based on historical agricultural land management practices may potentially create a perverse incentive for project developers to apply prejudicial practices to reduce soil organic carbon (e.g. excessive tillage) during the pre-project period to set the baseline. The ICVCM recognizes, however, that this risk is very unlikely to materialize, as such practices would also negatively impact agricultural productivity and profitability during the pre-project period.

The Governing Board encourages further methodological development regarding baseline-setting and additionality demonstration in the agriculture sector and that a continuous improvement work program may serve this need.

5. Permanence

ICVCM notes that Verra (VCS) VM0042 version 2.2 establishes a monitoring and compensation period of 40 years from the start date of the first crediting period, in line with ICVCM requirements for permanence.

ICVCM notes that the CAR U.S. Soil Enrichment Protocol version 1.1 defines ten-year crediting periods, renewable up to two times. When the total crediting period for a field has concluded, the field enters a binding "permanence period" until the minimum time commitment of forty years is met.

Under the CAR methodology, permanence period commitments are formalized through a Project Implementation Agreement (PIA), which guarantees through a legal agreement that obligates the Project Owner to conduct monitoring activities on the project area for a defined period, to contribute to the CAR shared buffer pool during the crediting period (with contribution levels determined by a project-specific risk analysis), and to compensate for avoidable reversals that occur during the permanence commitment.

For projects committing to less than one hundred years, credit issuance is adjusted proportionally to the duration of the permanence period, relative to a hundred-year benchmark. This proportional issuance reflects the atmospheric benefit of storing carbon for a limited time, also known as Tonne-Year Accounting (TYA) approach. This approach remains under assessment by ICVCM.

The Governing Board observes that to meet the ICVCM Assessment Framework criteria on Permanence – particularly regarding buffer pool contributions and minimum monitoring and compensation periods – projects are required to achieve a minimum forty-year permanence commitment secured by Project Implementation Agreement (PIA) in place for the whole period. The Governing Board therefore decided to approve CAR U.S. Soil Enrichment Protocol subject to this condition being met.

6. Environmental and Social Safeguards

The Governing Board underlines the critical importance of robust environmental and social safeguards in Sustainable Agriculture projects. Effective oversight mechanisms are essential to ensure that project activities do not compromise ecological integrity or community well-being. The Governing Board notes that Genetically Modified Organism (GMO)-based crops can provide

agronomic benefits, but their large-scale use may present environmental and social risks. The Assessment Framework requires environmental and social safeguards to be assessed by mitigation activity proponents[7]. Where risks of negative environmental and/or social impacts are identified, commensurate measures must be implemented to minimize and address these risks.

[7] Please refer to ICVCM Assessment Framework Section 7.