# VM0047 AFFORESTATION, REFORESTATION AND REVEGETATION METHODOLOGY ASSESSMENT REPORT

Document Prepared by Aster Global Environmental Solutions Inc.

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| **Methodology Category** | Methodology |
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**Summary**

Aster Global Environmental Solutions, Inc., (Aster Global) was commissioned by Verra to perform the methodology assessment of the VCS methodology "VM0047 Afforestation, Reforestation and Revegetation" in accordance with the VCS Program Guide, the Methodology Development and Review Process, and the Methodology Requirements.

The Methodology is applicable to all VCS Afforestation, Reforestation and Revegetation (ARR) projects with some exceptions, as detailed in the Applicability Conditions section (4) of the document. It was developed as the first VCS methodology for ARR projects and incorporates two quantification approaches – the census-based approach, and the area-based approach.

The purpose and scope of this new methodology assessment was to evaluate whether the methodology document was prepared in line with the VCS program requirements. Aster Global's methodology assessment included a detailed review of adherence to the VCS

Program Guide, the VCS Methodology Development and Review Process, and the VCS Methodology Requirements, with regard to applicability conditions, project boundary, baseline approach, additionality, emissions/removals, leakage, monitoring, data and parameters, and adherence to the principles of the VCS rules and requirements (relevance, completeness, consistency, accuracy, transparency and conservativeness). Aster Global's methodology assessment also included a detailed analysis of the methodology, public comments, literature reviews, technical reviews and responses to all non-conformance reports (NCRs), clarifications (CLs), and opportunities for improvement (OFIs) based on the VCS rules and requirements.

The methodology assessment team identified 248 findings (NCRs, CLs and OFIs). All were addressed satisfactorily in line with the VCS program requirements. These NCRs, CLs, and OFIs provided necessary clarity to ensure the methodology was in compliance with the VCS rules and requirements. All findings were appropriately addressed and are depicted in Appendix B.

Aster Global confirms all methodology assessment activities, including objectives, scope and criteria, level of assurance and the methodology's adherence to the VCS Program, as documented in this report, are complete. Aster Global concludes without any qualifications or limiting conditions that VM0047 Afforestation, Reforestation and Revegetation meets the requirements of the VCS Program. Aster Global recommends that Verra approve the methodology.

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# 1 INTRODUCTION

## 1.1 Objective

This methodology assessment was performed to evaluate the likelihood that implementation of the methodology would result in accurate calculations and appropriate eligibility criteria for GHG emission reductions/removals (ISO 14064-3:2019). This report summarizes the findings of the methodology assessment of the Verified Carbon Standard (VCS) methodology development and review process. Verra, referred to as the "Methodology Developer", has commissioned Aster Global Environmental Solutions, Inc. (Aster Global), referred to as the "Assessment Team," to perform the methodology assessment of VM0047 Afforestation, Reforestation and Revegetation, hereafter referred to simply as VM0047 or the Methodology.

This report presents the findings of a qualified methodology assessment team of auditors and experts in methodologies for GHG emissions, who have assessed the methodology and associated leakage module for compliance under the applicable rules of the VCS Program. Section 2 below presents the methodology assessment approach, Section 3 below summarizes the methodology assessment process and conclusions, and Appendix A provides details and resolutions of all individual findings from the methodology assessment process.

## 1.2 Summary Description of the Methodology

VM0047 is applicable to VCS afforestation, reforestation and revegetation (ARR) projects with some exceptions, as detailed in the Applicability Conditions section (4) of the document. It was developed as the first VCS methodology for ARR projects and incorporates two quantification approaches – the census-based approach, and the area-based approach.

The Methodology allows a project to demonstrate additionality and develop the crediting baseline through either a performance method or project method. Further, the Methodology requires the use of a new, standardized approach module for determination of leakage – "VMD0054 Module for Estimating Leakage from ARR Activities," which is described in a separate report.

# 2 ASSESSMENT APPROACH

## 2.1 Method and Criteria

This methodology assessment is based on standard auditing techniques in line with Verra Requirements to assess the correctness of the information provided. In accordance with the VCS rules, a methodology assessment encompasses applicability conditions, project boundary,

procedure for demonstrating additionality, procedure for determining baseline scenario, baseline emissions, leakage, quantification of net GHG emission reduction and/or removals, monitoring, data and parameters, and relationships to approved or pending methodologies.

The Verra documents used to assess the Methodology were:

- Program Guide (v4.3, 17 January 2023)
- Program Definitions (v4.3, 21 December 2022)
- Methodology Requirements (v4.3, 17 January 2023)
- Methodology Development and Review Process (v4.2, 17 January 2023)
- Methodology Template (v4.2, 21 December 2022)
- Methodology Assessment Report Template (v4.1, 21 December 2022)
- Validation and Verification Manual (v3.2, 19 October 2016)

Note that the most recent VCS Program documents from 29 August 2023 are not listed above. Per Verra, it was acceptable to report the previous versions used throughout the methodology assessment process, as this current report had already been drafted and review completed prior to the program updates. Further, the new methodology requirements were applicable to methodologies that had not yet solicited public comments.

## 2.2 Document Review

All documents reviewed in the methodology assessment are in listed in Appendix A.

## 2.3 Interviews

Interviews were conducted online using Microsoft Teams via typical channels, including the opening meeting, methodology walkthrough, meetings to discuss findings, in addition to email exchanges, phone calls, and the closing meeting. Details and attendees of each meeting are included below:

| **Opening Meeting to discuss action items** | **10 June 2022** |
|---|---|
| *Methodology Assessment Team* | *Methodology Development Team* |
| Mansfield Fisher – Aster Global | Abel Marcarini – Verra |
| Matthew Perkowski – Aster Global | Cecilia Simon – Verra |
| Janice McMahon – Aster Global | Diego Navarrete – Verra |
| Shawn McMahon – Aster Global | David Shoch – Terra Carbon |
| Cindy McClure – Aster Global | Scott Settelmyer – Terra Carbon |

| **Meeting to discuss Leakage Module** | **20 July 2022** |
|---|---|
| *Methodology Assessment Team* | *Methodology Development Team* |
| Mansfield Fisher – Aster Global | Abel Marcarini – Verra |
| Matthew Campbell – Aster Global | Scott Settelmyer – Terra Carbon |
| Sandesh Shrestha – Aster Global | |
| Caitlin Sellers – Aster Global | |
| **Meeting to discuss overall Methodology and walkthrough** | **16 August 2022** |
| *Methodology Assessment Team* | *Methodology Development Team* |
| Shawn McMahon – Aster Global | Abel Marcarini – Verra |
| Matthew Perkowski – Aster Global | Diego Navarrete – Verra |
| Matthew Campbell – Aster Global | David Shoch – Terra Carbon |
| Sandesh Shrestha – Aster Global | |
| Caitlin Sellers – Aster Global | |
| **Meetings to discuss Round 1 Findings** | **04, 06 & 12 January 2023** |
| *Methodology Assessment Team* | *Methodology Development Team* |
| Justin Ziegler – Aster Global | David Shoch – Terra Carbon |
| Matthew Campbell – Aster Global | Spencer Plumb - Verra |
| Sandesh Shrestha – Aster Global | Scott Settelmyer – Terra Carbon |
| Caitlin Sellers – Aster Global | |
| **Meeting to discuss Round 2 Findings** | **08 March 2023** |
| *Methodology Assessment Team* | *Methodology Development Team* |
| Justin Ziegler – Aster Global | David Shoch – Terra Carbon |
| Matthew Campbell – Aster Global | Spencer Plumb - Verra |
| Sandesh Shrestha – Aster Global | |
| Shawn McMahon – Aster Global | |
| **Meeting to discuss Round 3 Findings** | **17 April 2023** |
| *Methodology Assessment Team* | *Methodology Development Team* |

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| Justin Ziegler – Aster Global | David Shoch – Terra Carbon |
| Matthew Campbell – Aster Global | Spencer Plumb - Verra |
| Sandesh Shrestha – Aster Global | |
| Shawn McMahon – Aster Global | |

| **Additional Meeting to discuss Round 3 Findings** | **25 April 2023** |
|---|---|
| *Methodology Assessment Team* | *Methodology Development Team* |
| Shawn McMahon – Aster Global | David Shoch – Terra Carbon |
| Justin Ziegler – Aster Global | |
| Matthew Campbell – Aster Global | |
| Sandesh Shrestha – Aster Global | |
| Caitlin Sellers – Aster Global | |

| **Meeting to discuss Round 5 Findings** | **15 June 2023** |
|---|---|
| *Methodology Assessment Team* | *Methodology Development Team* |
| Shawn McMahon – Aster Global | David Shoch – Terra Carbon |
| Justin Ziegler – Aster Global | Spencer Plumb - Verra |
| Caitlin Sellers – Aster Global | |
| Matthew Campbell – Aster Global | |
| Sandesh Shrestha – Aster Global | |

| **Meeting to discuss Round 6 Findings** | **30 August 2023** |
|---|---|
| *Methodology Assessment Team* | *Methodology Development Team* |
| Caitlin Sellers – Aster Global | Christian Ehrat – Verra |
| | Spencer Plumb – Verra |

## 2.4 Assessment Team

The names, roles, and summary of qualifications/expertise/experience relevant to the methodology assessment team follow:

| Name | Role | Summary of qualifications, expertise, relevant methodology experience |
|---|---|---|

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|---|---|---|
| Shawn McMahon | Lead Assessor and Verra-approved IFM Expert | Vice-President, Lead Assessor, VCS WRC Non-Peatlands Expert. Approved to conduct third-party carbon sequestration validations and verifications under VCS (WRC, REDD, IFM and ARR Expert). Specializes in third-party carbon offset validations and verifications, carbon sequestration project development, development and implementation of management plans for enhancement of carbon stocks, development of carbon and environmental asset tracking programs, and team management. |
| Barbara Toole O'Neil | Verra-approved Standardized Methods Expert / Assessment Team Member | Since 2010 she has completed assessments of 14 new methodologies. Her work responsibilities have addressed a wide range of environmental issues from preparing inventories or offset project documents to assessing methodologies submitted to the Verified Carbon Standard (VCS) (forestry to energy efficiency); , validating/ verifying inventories and carbon offset projects, corporate social responsibility auditing, developing governance for sustainability non-profits, to writing a social standard to assess the impact of environmental projects (carbon, water, forestry, agriculture) on the quality of life for women in emerging third world countries. |
| Caitlin Sellers | Assessment Team Member | Ms. Sellers has been involved in environmental, forest, wetland and wildlife projects for over 15 years and has specialized in forest carbon project auditing for 9 years. She is directly involved in validation and verification of forest carbon offsets and methodologies. |
| Mansfield Fisher | Assessment Team Member | Mr. Fisher received his MS in Forestry and MS in Economics from North Carolina State University in 2020. Previously, Mr. Fisher worked for The Nature Conservancy working on restoration of the longleaf pine habitats in coastal North Carolina. Mr. Fisher has extensive knowledge in econometric modeling related to land use conversion. |
| Sandesh Shrestha | Assessment Team Member / GIS & Remote Sensing Specialist | Mr. Shrestha received his MS in Forestry from University of Maine in 2019. Mr. Shrestha has experience working in multiple projects in the United States and in Nepal. Prior to joining the Aster Global team, he worked as a Geospatial Research Associate |

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| | | with Kentucky State University where he focused on the acquisition, compilation, and processing of geospatial data using satellite imagery, LiDAR, and UAV drones for creating ecosystem assessments, land use/cover change, and watershed modelling. Mr. Shrestha is a published author of numerous research projects in the United States and Nepal related to hydrology, remote sensing applications, LULC change, climate change impact, community perception and vulnerability studies. Mr. Shrestha is a professional member of the Society of American Foresters and Nepal Forester's Association. |
| Matthew Campbell | Assessment Team Member | Mr. Campbell received his MS in Environmental Studies and Graduate Certificate in Geographic Information Sciences (GIS) from University of North Carolina Wilmington in 2016. Previously, Mr. Campbell has worked as a crew lead and field coordinator for forestry crews working on a long-term climate change forestry research project in Sierra Nevada mixed-conifer forests through the University of Nevada Reno. |
| Justin Ziegler | Assessment Team Member / Forest Biometrician | Dr. Ziegler received his Bachelor of Science in Forest Resources from the University of Idaho, and Master of Science and PhD both in Forest Sciences from Colorado State University. Dr. Ziegler has experience teaching at the university setting and as a practicing forester, in sampling design, biometry, data analyses and computational modeling. He has 15 publications in forest and fire science, including areas of natural resource inventories, growth-and-yield modeling, and forest carbon measurements. He is certified as a Professional Forester with the Society of American Foresters and as a Certified Wildland Fire Ecologist and Wildland Fuels Scientist with the Association for Fire Ecology. |
| Janice McMahon | QA/QC / President | Specializes in natural resource management projects including carbon sequestration feasibility assessments, development and implementation of management plans for enhancement of ecosystem services, assessment of GHG emissions and reductions, development of environmental asset |

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| | | tracking programs, GHG validations and verifications, endangered/ threatened species assessments, habitat management plans, and integrated ecosystem services plans. Responsible for leading the Forestry, Carbon, and GHG Services Division, which includes client and team coordination, proposal preparation and review, marketing presentations, maintenance of Aster Global's ANSI accreditation and management System, and quality assurance and quality control for projects in the United States as well as the international market. |

## 2.5 Resolution of Findings

The process of methodology assessment involved six (6) formal rounds of evaluation by the assessment team and resulted in a methodology version in conformance with VCS rules. Findings related to corrective action, clarification requests or other findings were resolved during communication between the assessment team and the methodology development team. More specifically, where noted by the assessment team, the methodology development team implemented corrective actions by amending methodology text and requirements and providing written clarification responses. Types of findings were characterized in the following manner:

**Non-Conformance Reports** (NCRs) were issued as a response to material discrepancies in a part of the methodology and generally fell into one of the following categories:

- Non-conformance to a VCS guiding document listed in Section 2.1 above
- Internal consistency among methodology sections/appendices was lacking
- Mathematical formulae in modules were incorrect
- Additional information was required by the assessment team in order to confirm reasonable assurance for compliance

**Clarifications** (CL) were issued when language within the methodology needed extra clarification to avoid ambiguity/confusion for the reader.

**Opportunities for Improvement** (OFI) were issued to the methodology developer when an opportunity for improvement was identified but was not required to be addressed to confirm to VCS rules.

During the course of the methodology assessment, 248 findings (NCRs, CLs, and OFIs) were identified. Of those, Aster Global ensured *reasonable* assurance was achieved to close all findings. Details on how each finding was closed can be found in Appendix A. Throughout the methodology assessment, all NCRs/CLs were eventually satisfactorily addressed to the standards and

requirements of Aster Global and/or VCS. The NCRs/CLs provided necessary clarity to ensure the methodology complied with the requirements of VCS. Detailed summaries of each finding, including the issue raised, responses and final conclusions are provided in Appendix B.

A brief summary of some findings listed includes methodology requirements, performance benchmark, additionality, definitions, and equations:

**Finding #5:** The VCS rules require the performance benchmark to be specified in one of four (4) metrics. The methodology's performance benchmark results in a unitless percentage, which was not one of the four metrics.

Resolution: The developer explained how the end result of the metric would be equivalent to one of the required outcomes, resulting in a rate of change ratio applied to direct measurement of carbon stocks. The assessment team believes this meets the intent of the requirement and considered the Finding addressed.

**Finding #7:** The performance benchmark (Appendix 1 of the Methodology) contained a set of requirements (factors) to assess control area eligibility. The factors include jurisdictional boundary, ecoregion, policy environment, outside any registered AFOLU project, initial land use/land cover with potential for vegetative growth, and land tenure. However, it did not appear to discuss how the selected level does not systematically overestimate GHG emission reductions or removals.

Resolution: The developer edited Appendix 1 to include a significance test to demonstrate differences between project and controls and reject cases of false positives. The assessment team believed this edit ensures the level would not systematically overestimate GHG emission reductions or removals.

**Finding #37**: Implementation barriers for the barrier analysis of the additionality requirements in the original version of the methodology were broad and did not contain enough specificity to ensure uniform implementation across multiple domains.

Resolution: The methodology developer removed the broad range of implementation barriers and included an investment barrier only, which was more straightforward and easier to broadly interpret across different project locations and jurisdictions. This provided the assurance need for the assessment team to close the finding.

**Finding #57:** The methodology did not originally include an exhaustive list of key definitions used throughout the document.

Resolution: Throughout the methodology assessment process, new definitions and acronyms were added and defined to satisfy the VCS rules that methodologies include definitions for all terms not already defined in VCS program documents.

**Finding #86:** The equations noted throughout the methodology were not linear, and clarity and correction was needed to many of the original equations, as noted.

Resolution: The methodology developer added diagrams to depict the nature of the equations, and the assessment team noted their inclusion should be sufficient in providing clarity in linear

application of equations. Final editing of the methodology document yielded concise and clear equations.

# 3 ASSESSMENT FINDINGS

VM0047 was found to be incompliance with the principles set out in the VCS Standard and other VCS rules and requirements. The new methodology provides ARR project quantification methodologies, while adhering to the principles of VCS (relevance, completeness, consistency, accuracy, transparency, and conservativeness).

Applicable VCS-approved tools are appropriately cited for determining project significance, baseline, additionality and risk. The methodology assessment addressed specific issues that arose in the methodology, which are pertinent to the above-mentioned principles set forth by the VCS Standard.

## 3.1 Relationship to Approved or Pending Methodologies

| Methodology | Title | GHG Program | Developer Comments | Assessor Comments |
|---|---|---|---|---|
| ACM0003 | A/R Large-scale Consolidated Methodology Afforestation and reforestation of lands except wetlands | CDM | ACM0003 uses a project method to demonstrate additionality and establish a crediting baseline. The new methodology expands on ACM0003 by providing a performance method as part of the area-based quantification approach, while retaining a project method for the census-based approach.<br>ACM0003 procedures for the quantification of carbon pools in the project scenario are used in the new methodology.<br>This methodology will improve upon the determination of the baseline scenario and demonstration of additionality. The new methodology provides two distinct quantification paths, | The assessor agrees that the new methodology is the first of its kind within the Verra organization and will present options for both project method and performance benchmark method approaches. There were no other existing methodologies for ARR projects within VCS, so it is appropriate for the creation of this new methodology to enact framework specifically in line with Verra guidelines and VCS program requirements. |

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| | | | Area-based and Census-based approaches depending on planting intensity and location. | |
| AR-AMS0007 | A/R Small-scale Methodology<br>Afforestation and reforestation project activities implemented on lands other than wetlands | CDM | The VCS does not currently have its own ARR methodology and seeks to provide a unified accounting approach for ARR projects. AR-AMS0007 uses a project method to demonstrate additionality and establish a crediting baseline. The new methodology does not distinguish between large- and small-scale activities. | The assessor agrees that the new methodology is the first of its kind within the Verra organization and will present options for both project method and performance benchmark method approaches. There were no other existing methodologies for ARR projects within VCS, so it is appropriate for the creation of this new methodology to enact framework specifically in line with Verra guidelines and VCS program requirements. |
| AR-AM0014 | Afforestation and reforestation of degraded mangrove habitats | CDM | Restoration of mangroves is treated in VM0033. | This methodology does not include degraded mangrove habitats, so this is N/A and will be covered in VM0033. |
| AR-AMS0003 | A/R Small-scale Methodology<br>Afforestation and reforestation project activities implemented on wetlands | CDM | Afforestation and reforestation project activities implemented on wetlands are treated in VM0033. | This methodology does not include WRC, so this is N/A and will be covered in VM0033. |

## 3.2 Stakeholder Comments

The methodology was listed for public stakeholder consultation from 17 December 2021 to 28 January 2022. A total of 109 public comments were received during this consultation process. Due to total number of comments, a separate appendix has been prepared (Appendix C). The Assessment Team and Verra both reviewed the public comments and the methodology development team's responses. The assessment team confirmed closure of all public comments. All comments, the developer's response to each comment, any resultant changes to the methodology, and an explanation of appropriateness are included in the Appendix C. This review ensured that the developer has adequately addressed all stakeholder comments.

## 3.3 Structure and Clarity of Methodology

Through the methodology development and review process, the assessment team ensured the methodology was written in a clear, logical, concise and precise manner in accordance with the Methodology Development and Review Process.

- The developer has followed the instructions in the methodology template and ensured that the methodology's various criteria and procedures are documented in the appropriate sections of the template. This was confirmed through a detailed review of the template requirements within the assessment team's Findings process. Several Findings were issued related to the Methodology's consistency with the template, and all Findings were resolved to ensure VCS requirements were achieved.
- The terminology used in the methodology is consistent with that used in the VCS Program, and GHG accounting generally. The assessment team issued Findings related to VCS definitions, and all Findings were resolved to ensure terminology was consistent.
- The key words must, should and may have been used appropriately and consistently to denote firm requirements, (non-mandatory) recommendations and permissible or allowable options, respectively. This was confirmed through the assessments team's overall read, interpretation, and review process. The developer did change terms as a result of the Findings from the assessment team to be more compatible with VCS rules.
- The criteria and procedures are written in a manner that can be understood and applied readily and consistently by project proponents. Applicable Findings were resolved to ensure this was achieved.
- The criteria and procedures are written in a manner that allows projects to be unambiguously audited. Several Findings were issued to ensure the methodology can be consistently and robustly applied to a broad spectrum of project types. The Findings were resolved sufficiently.

Overall, it is the Assessment Team's opinion that the structure of the methodology document meets the methodological requirements of the VCS Program.

## 3.4 Definitions

The key terms defined in the methodology and performance benchmark appendix are presented clearly and appropriately in the Definitions sections at the beginning of the documents by the methodology developers for ease of use. The methodology assessment process ensured definitions of key terms are presented concisely and can assist the reader in comprehension for effective implementation of the methodology.

## 3.5 Applicability Conditions

During the methodology assessment process, the assessment team ensured the applicability conditions were appropriate for the activities targeted by the methodology. Quantification procedures required by the methodology adequately target the relevant applicability conditions. The applicability conditions appropriately specify relevant requirements to individual projects.

The methodology assessment determined the applicability conditions contained within the methodology are appropriate, adequate and in compliance with the VCS Program.

Further, the assessment team determined the applicability conditions provide sufficient clarity to projects determining if their activities are or are not eligible under the methodology. The applicability conditions address environmental integrity and practical considerations, where relevant.

The following summarizes the applicability conditions as written, changes made during the revision of the methodology, and the final evaluation of those changes during the methodology assessment.

The applicability conditions follow:

1) "Project activities increase vegetative cover; and."[1]

   Assessment: This applicability condition provides the broad application of the methodology to ARR activities that increase vegetative cover. The applicability condition is written in a clear and concise manner, ensuring a project activity adheres to the condition and that conformance can be demonstrated at the time of project validation.

2) "Area based, census based, or a combination of the two quantification approaches may be used provided approach-specific applicability conditions are met. Approaches must be selected at the project start date and used for the entire project crediting period. Where the two approaches are used together, they must be applied in non-overlapping areas defined at the project start (see Section 5 on delineation of spatial boundaries to ensure non-overlap)."[2]

   Assessment: This applicability condition ensures consistent project application of approaches at the start of the project and ensures no overlap (double-counting) will happen. The applicability condition is written in a clear and concise manner, ensuring a project activity adheres to the condition and that conformance can be demonstrated at the time of project validation.

The methodology is not applicable under the following conditions:

3) Project activities (e.g., site preparation) involve mechanical removal offsite or burning of significant stocks of pre-existing dead wood. Where project site preparation includes chipping, mastication or machine piling, all material must remain onsite within project boundary."[3]

   Assessment: Because the single applicability condition is designed to include a broad range of ARR projects, further ineligibility conditions were needed to ensure appropriate land

[1] VCS Methodology VM0047 Afforestation, Reforestation and Revegetation, V1.0, 28 September 2023, Page 8

[2] Ibid, Page 8

[3] Ibid, Page 8

sustainability. The exclusion condition is written in a clear and concise manner, ensuring a project activity adheres to the condition and that conformance can be demonstrated at the time of project validation.

4) "Project activities take place in tidal wetlands (e.g. mangroves, salt marshes)."[4]

   Assessment: It is appropriate to exclude these types of projects, as there are other methodologies specifically designed to ensure accounting of GHG emissions and reductions in tidal wetlands is accurate.

5) "Project activities that occur on organic soils or in wetlands and result in manipulation of the water table. Planting species that do not naturally occur in organic soils or wetlands is considered a manipulation of the water table. Where projects take place on organic soils and manipulate the water table, they must be developed using a multiple project activity design combining this methodology and a Wetland Restoration and Conservation methodology."[5]

   Assessment: The VCS Standard requires projects that occur on wetlands adhere to the Standard requirements for WRC activities. Thus, the Assessor believes the exclusion of this project type from typical ARR activities is acceptable and that a separate assessor evaluation of WRC methodology requirements was not necessary, as this is strictly an ARR methodology.

The following applicability conditions are differentiated based on the approach taken by the project developer:

**"Area-based approach**

1) ARR activities produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare.

**Census-based approach**

2) Project activity must be direct planting (i.e., must not involve facilitated natural regeneration)
3) Project activity must not produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare.
4) Individual planting units of woody biomass must be clearly defined (e.g., tree, shrub, bamboo clump) and identifiable in the field, with each planting unit given a physical marker onsite with a unique ID and location recorded by GPS with minimum accuracy of five meters.
5) The project activity must:

[4] Ibid, Page 8

[5] Ibid, Page 9

a) take place within areas classified as non-forest for the past ten years, with less than 10% percent pre-existing woody biomass cover, and

b) Occur in an area that is subject to continuous cropping, in "settlements", or "other lands" land use category.

6) An initial complete census of all planting units must be conducted.

7) Projects are considered ineligible if woody biomass, which serves a similar purpose as the planting units in the project, has been removed within the last 10 years. (confirmed via pre-project photos and/or attestation).

8) Any soil disturbance from the project activity (i.e., from site preparation):

a) Occurs only once during the project crediting period (i.e., at site preparation) or

b) Does not involve soil inversion to a depth exceeding 25 cm (e.g., that would result from a moldboard plow)."[6]

Assessment: The additional above conditions were added post Verra internal review of the methodology. These conditions ensure there is no overlap of approach types within any given project. They also provide bounds for census-based activities to ensure they are real. The assessment team agrees the additional applicability conditions are clear, can be followed by a project developer, and will result in real and accurate accounting of ARR project activities.

## 3.6 Project Boundary

The VCS Methodology Requirements require the methodology establish criteria and procedures for describing the project boundary and identifying and selecting optional carbon pools, e.g., sources, sinks, and reservoirs relevant to the baseline and project scenarios. Procedures to quantify emissions are appropriately included in all required carbon pools.

The methodology provides a clear diagram (Tables 2.1 and 2.2) of carbon pools. The assessment team's comments are included below:

**Selected Carbon Pools in the Project Boundary using the Area-based approach**

| Carbon Pool | Included? | Justification/Explanation | Assessor Comments |
|---|---|---|---|
| Aboveground woody biomass | Yes | Major carbon pool | The assessor confirms this is the major carbon pool for the methodology, it is clearly specified and appropriate for project activities covered by the methodology. |

[6] Ibid, Pages 9 & 10

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| Aboveground non-woody biomass | Yes/ Optional | Must be included in if the project activity significantly reduces the carbon pool as per Appendix 2.<br><br>For other cases this carbon pool is optional. | This source is appropriately included when changes from the baseline to project scenario for this source are deemed significant through application of the tool in Appendix 2. In other cases, inclusion of this source as optional is appropriate. The assessor confirms the specification of this source is clear and appropriate for project activities covered by the methodology. |
| Belowground woody biomass | Yes | Major carbon pool | The assessor confirms this is the major carbon pool for the methodology. It is clearly specified and appropriate for project activities covered by the methodology. |
| Belowground non-woody biomass | Yes/ Optional | Must be included if the project activity significantly reduces the carbon pool as per Appendix 2.<br><br>For other cases this carbon pool is optional. | This source is appropriately included when changes from the baseline to project scenario for this source are deemed significant through application of the tool in Appendix 2. In other cases, inclusion of this source as optional is appropriate. The assessor confirms the specification of this source is clear and appropriate for project activities covered by the methodology. |
| Dead wood | Optional | Carbon stock in this pool may increase due to implementation of the project activity. | This source is appropriately included as optional, as implementation of certain instances of project activities may lead to carbon stock increases. The assessor confirms that exclusion in other cases is appropriate based on the methodological approach associated with the performance benchmark. The assessor confirms the specification of this source is clear and appropriate for project activities covered by the methodology. |
| Litter | Yes/ Optional | Must be included if the project activity significantly reduces the carbon pool (i.e., is not determined to be de minimis via Appendix 2). | This source is appropriately included when changes from the baseline to project scenario for this source are deemed significant through application of the tool in Appendix 2. |

| | | | |
|---|---|---|---|
| | | For other cases this carbon pool is optional. | In other cases, inclusion of this source as optional is appropriate. The assessor confirms the specification of this source is clear and appropriate for project activities covered by the methodology. |
| Soil organic carbon (SOC) | Yes/ Optional | Must be included where soil disturbance from the project activity (i.e., from site preparation):<br>1) Occurs more than once during the project crediting period (i.e., at site preparation); or<br>2) Involves soil inversion to a depth exceeding 25 cm (e.g., that would result from a moldboard plow).<br>Where project activity does not cause soil disturbance, the inclusion of this carbon pool is optional. | This source is appropriately included when changes associated with the soil disturbance scenarios described are included in project activities. In all other cases, inclusion of this source as optional is appropriate. The assessor confirms the specification of this source is clear and appropriate for project activities covered by the methodology. |
| Harvested wood products | Excluded | Conservative to exclude. | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |

**Selected Carbon Pools in the Project Boundary using the Census-based approach**

| Carbon Pool | Included ? | Justification/Explanation | Assessor Comments |
|---|---|---|---|
| Aboveground woody biomass | Yes | Major carbon pool | The assessor confirms this is the major carbon pool for the methodology, it is clearly specified and appropriate for project activities covered by the methodology. |

| | | | |
|---|---|---|---|
| Aboveground non-woody biomass | Excluded | Conservative to exclude | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Belowground woody biomass | Yes | Major carbon pool | The assessor confirms this is the major carbon pool for the methodology, it is clearly specified and appropriate for project activities covered by the methodology. |
| Belowground non-woody biomass | Excluded | Conservative to exclude | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Dead wood | Excluded | Conservative to exclude | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Litter | Excluded | Conservative to exclude | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Soil organic carbon (SOC) | Excluded | Conservative to exclude | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Harvested wood products | Excluded | Conservative to exclude | The assessor confirms that exclusion of this carbon pool is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |

The greenhouse gases included in or excluded from the project boundary are shown in the table below.

**GHG Sources Included In or Excluded From the Project Boundary**

| Source | Gas | Included? | Justification/Explanation | |
|---|---|---|---|---|
| Burning of biomass (whether by natural or anthropogenic causes) | $CO_2$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $CH_4$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $N_2O$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Emissions from nitrogen fertilizer | $CO_2$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $CH_4$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $N_2O$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| Burning of fossil fuels | $CO_2$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $CH_4$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $N_2O$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | this source is clear and appropriate for project activities covered by the methodology. |
| | Burning of biomass (natural or anthropogenic causes) | $CO_2$ | No | Carbon stock decreases due to burning are accounted as a carbon stock change | The assessor confirms that carbon stock decreases from burning are accounted as a carbon stock change, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | | $CH_4$ | Yes | May be a significant source | The assessor confirms that inclusion of this GHG source is appropriate, as $CH_4$ emissions associated with burning of biomass may be a significant source if biomass burning is included in project activities. The assessor confirms that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | | $N_2O$ | Yes | May be a significant source | The assessor confirms that inclusion of this GHG source is appropriate, as $N_2O$ emissions associated with burning of biomass may be a significant source if biomass burning is included in project activities. The assessor confirms that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | Emissions from nitrogen fertilizer | $CO_2$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | | $CH_4$ | No | Conservative to exclude | The assessor confirms that exclusion of this GHG source is conservative, and that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | | $N_2O$ | Yes | May be a significant source | The assessor confirms that inclusion of this GHG source is appropriate, as N20 emissions associated may be a significant source if nitrogen fertilizers are applied as part of project activities. The assessor confirms that specification of this source is clear and appropriate for project activities covered by the methodology. |

| | | | | |
|---|---|---|---|---|
| Burning of fossil fuels | $CO_2$ | No | De minimis | The assessor confirms that emissions from this GHG source are appropriately listed as de minimis, as implementation of project activities is unlikely to increase burning of fossil fuels. The assessor confirms that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $CH_4$ | No | De minimis | The assessor confirms that emissions from this GHG source are appropriately listed as de minimis, as implementation of project activities is unlikely to increase burning of fossil fuels. The assessor confirms that specification of this source is clear and appropriate for project activities covered by the methodology. |
| | $N_2O$ | No | De minimis | The assessor confirms that emissions from this GHG source are appropriately listed as de minimis, as implementation of project activities is unlikely to increase burning of fossil fuels. The assessor confirms that specification of this source is clear and appropriate for project activities covered by the methodology. |

## 3.7 Baseline Scenario

This methodology allows for two scenarios of baseline determination: an area-based approach and a census-based approach. The methodology is designed to be flexible for different project situations; thus, dual baseline approaches are included in the methodology. The specific details of each approach are included in Table 1 of the methodology.

The area-based approach is a standardized method that uses a performance benchmark for setting the crediting baseline. The performance benchmark is the business-as-usual rate of establishment of new vegetative cover and productivity relative to the project activities. This is established by representative sample plots taken from outside the project area and monitored over time. The methodology details the technical requirements for establishing the performance benchmark in a separate Appendix 1 to be utilized by the project developer.

Using the performance benchmark approach, a project developer will monitor the stocking index of both remotely sensed control and project plots at least annually. The control plots will need to follow certain matching criteria, and if not, then they will be thrown out and the weighting of the remaining plots adjusted to 1. Through thorough review of the performance benchmark, the assessor believes the methodology provides accurate accounting of a non-stagnant baseline. The

performance benchmark (Appendix 1) and confirms and concludes it is appropriate for ARR project activities covered by the methodology.

The census-based approach is a project method that represents the absence of planting in the baseline scenario, which is proven by demonstration of implementation barriers. A project must demonstrate it takes place within an area with pre-existing woody biomass cover < 10%, and/or in an area subject to continuous cropping or in a settlements or other lands land use categories. The assessor reviewed these baseline requirements and confirmed the census-based baseline approach is appropriate for the project category of ARR.

## 3.8 Additionality

Depending on the method the project chooses to apply (area-based or census-based), different criteria and procedures for determining additionality apply. All project types must show regulatory surplus as a first step to proving additionality, in line with VCS Program requirements.

For the area-based approach, additionality is established using the performance benchmark approach. Performance benchmark is determined by comparing the average rate of change in stocking index (*SI*) between project and control plots. The methodology defines *SI* as an unspecified remote sensing metric that has demonstrated correlation with terrestrial aboveground carbon stocks. *SI* may be derived using different remote sensing metrics (e.g., normalized difference fraction index, average canopy height derived from LiDAR or percentage canopy cover interpreted from aerial imagery).[7] To establish additionality for the performance benchmark, there should be significant difference between average annual increase in stocking index (SI) in control plots ($\Delta SI_{control,t}$) and average annual increase in SI in project plots ($\Delta SI_{wp,t}$). The significance of the difference between $\Delta SI_{control,t}$ and $\Delta SI_{wp,t}$ is evaluated with a Z test[8] (See Appendix A).

Procedures to establish the performance benchmark are provided in Appendix 1. The assessment team examined the defined approach and confirmed that it is appropriate for determination of additionality, as the project is deemed additional when $\Delta SI_{control,t}$ and $\Delta SI_{wp,t}$ are significantly different. The assessment team reviewed the process for the determination of *SI* derived from remote sensing metrics and confirmed that approach described is based on established best practices. Further, sources of data to be used for deriving *SI* and QA/QC procedures to be applied are provided in Appendix 1.

Finally, an investment barrier must be applied if there are revenues or financial incentives other than from the sale of carbon credits. For the census-based approach, after proving regulatory surplus, the project must further show an investment barrier and show it is above common practice.

[7] Ibid, Page 77

[8] Ibid, Page 74

The steps for each component of demonstrating additionality are documented within Section 7 of the methodology. The assessor issued findings about the additionality criteria and procedures, which resulted in a well-defined process for both project types. The outcome of the methodology assessment resulted in a determination that the additionality analysis is appropriate for the activities covered by the methodology.

## 3.9 Quantification of GHG Emission Reductions and Removals

### 3.9.1 Baseline Emissions

The methodology delineates between the area-based and census-based approaches for quantification of baseline GHG emissions. For the census-based approach, the baseline will be zero, which the assessor confirms is appropriate as only planted units will be accounted for in the project. The area-based approach uses a previously described performance benchmark for setting the baseline. The assessment team can confirm the following:

- The procedures for calculating baseline emissions and removals cover all GHG sources, sinks and reservoirs (SSRs) (and carbon pools) included in the project boundary, including optional SSRs, as detailed in Tables 1-3 and through thorough review of all quantification procedures throughout the methodology assessment process.
- All algorithms, equations and formulae used are appropriate and without error. Through review of the quantification requirements, the assessment team found issues/errors in equations, etc., were corrected throughout the process enough to reasonably assure the assessment team that the resulting sections of the methodology were appropriate and without error.
- All models or default factors used are appropriate and in conformance with VCS Program requirements or same. The assessment team noted default factors in subject findings, and through the methodology assessment process, the default factors were considered appropriate for the methodology.
- The procedures for estimating parameters related to the quantification of baseline emissions are appropriate. The assessment team thoroughly reviewed Appendix 1 related to the performance benchmark and was assured the parameters would be estimated appropriately.

Through detailed review during the methodology assessment process, the assessment team can confirm with reasonable assurance that all procedures for estimating the baseline emissions for both the census-based and area-based approach are appropriate and without error.

### 3.9.2 Project Emissions

The methodology delineates between the area-based and census-based approaches for quantification of project GHG emissions and removals. For the census-based approach,

calculation of project emissions and removals are summarized in Figure 2. For the area-based approach, calculations of project emissions and removals are summarized in Figure 1. The assessment team can confirm the following:

- The procedures for calculating project emissions and removals cover all GHG SSRs (and carbon pools) included in the project boundary, including optional SSRs, as detailed in Tables 1-3 and through thorough review of all quantification procedures throughout the methodology assessment process.
- All algorithms, equations and formulae used are appropriate and without error. Through review of the quantification requirements, the assessment team found issues/errors in equations, etc., were corrected throughout the process enough to reasonably assure the assessment team that the resulting sections of the methodology were appropriate and without error.
- All models or default factors used are appropriate and in conformance with VCS Program requirements or same. The assessment team noted default factors in subject findings, and through the methodology assessment process, the default factors were considered appropriate for the methodology.
- The procedures for estimating parameters related to the quantification of project emissions and removals are appropriate. The assessment team thoroughly reviewed Appendix 1, data and parameters, and Section 8 quantification procedures and was assured the parameters would be estimated appropriately.

Through detailed review during the methodology assessment process, the assessment team can confirm with reasonable assurance that all procedures for estimating the project emissions and removals for both the census-based and area-based approach are appropriate and without error.

### 3.9.3 Leakage

The methodology delineates between the area-based and census-based approaches for quantification of project leakage. For the census-based approach, leakage is assigned a zero score, as planting units are kept small enough (1 hectare or less) to avoid any significant displacement of project activities.

For the area-based approach, calculation of leakage will occur using the most recent version of the "VMD0054 Module for Estimating Leakage from ARR Activities." This module was also assessed under this methodology review process. The assessment and appropriateness of the module are described in a report under separate cover. Through the module assessment process, the assessment team can confirm the procedures for calculating leakage conform with the VCS rules for ARR.

### 3.9.4 Net GHG Emission Reductions and Removals

The methodology delineates between the area-based and census-based approaches for quantification of net GHG emission reductions and removals. For both approaches, the required VCS equation, which subtracts project emissions and removals and leakage emissions from the baseline to result in net GHG emissions and removals, while applying the necessary uncertainty deduction, is generally applied with parameters specific to the actual approach noted.

Through the methodology assessment process, the assessment team can confirm the procedures for calculating net GHG emission reductions and removals conform with the VCS requirements. With reasonable assurance, the algorithms, equations, and formulae are appropriate and without error, and the assumptions used are conservative.

## 3.10 Monitoring, Data and Parameters

The following are the data, parameters and procedures available at validation. Through review of all data/parameters at validation, the assessment team confirms with reasonable assurance that they are appropriate for the project activities covered by the methodology. The assessment team concludes the data/parameters and procedures applied are in line with VCS rules.

| Data/Parameter | Assessment Team Findings |
|---|---|
| *A* | This is the project area measured in the unit of hectares, which is calculated with GIS data and appropriate, as it is an international unit that may be applied on all locations. |
| *R* | This is the root:shoot ratio, which is the ratio of belowground biomass to aboveground biomass. This is appropriate for calculating belowground biomass for both project types. The source must be regional or global data that is valid to the area. |
| *CF* | This is the carbon fraction of dry biomass, which is derived from IPCC 2006 Guidelines – a reputable source approved by Verra – to be used for the calculation of project emissions. |
| *N* | This is the initial population size measured in terms of the number of planting units. It is based on a complete census of all planting units and will be appropriately used for calculation of project emissions in the census-based approach. |
| $EF_{Ndirect}$ | This is an emission factor for direct nitrous oxide emissions from a variety of fertilizers, amendments, and residues. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |

| | |
|---|---|
| $Frac_{GASF}$ | This is a dimensionless fraction of all synthetic nitrogen added to soils that volatizes as $NH_3$ and $NO_x$. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |
| $Frac_{GASM}$ | This is a dimensionless fraction of all organic nitrogen added to soils that volatizes as $NH_3$ and $NO_x$. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |
| $EF_{Nvolat}$ | This is an emission factor for nitrous oxide emissions from atmospheric deposition of N on soils and water surfaces. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |
| $Frac_{LEACH}$ | This is a dimensionless fraction of nitrogen added to soils that is lost through leaching and runoff. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |
| $EF_{Nleach}$ | This is an emission factor for nitrous oxide emissions from leaching and runoff. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |
| $COMF$ | This is a dimensionless combustion factor. It is sourced from 2019 IPCC Guidelines and is appropriately required by the methodology. |
| $EFg$ | This is an emission factor for gas $g$ ($CH_4$ and $N_2O$). It is sourced from 2006 IPCC Guidelines and is appropriately required by the methodology. |
| $GWP_g$ | This is the dimensionless global warming potential for gas $g$. It is sourced from the latest IPCC Guidelines and is appropriately required by the methodology. |

The following are the data, parameters and procedures to be monitored through the project's lifetime. Through review of all data/parameters to be monitored, the assessment team confirms with reasonable assurance they are appropriate for the project activities covered by the methodology. The assessment team concludes the monitoring plan ensures that these elements of GHG emission reductions and removals are monitored and reported appropriately and the data/parameters and procedures for monitoring are in line with VCS rules.

| Data/Parameter | Assessment Team Findings |
|---|---|
| $M_t$ | This is the percent mortality though year $t$ derived from complete re-enumeration or sampling. The measurement methods and procedures are appropriately described, and monitoring will happen at minimum every 5 years. |

| | |
|---|---|
| $C_{WP-woody-AB,t}$ | This is the average aboveground woody biomass stocks in the project scenario for the area-based quantification approach, measured in t C per hectare. This is derived from direct field measurement at a minimum of every 5 years or less. This is an appropriate parameter for calculation of project emissions. |
| $B_{WP-woody-AB,pu,t}$ | This is the estimated biomass stock in aboveground woody biomass in sampled planting unit *pu*in the project scenario in year *t*. It is measured in the field for the census-based quantification and monitored every 5 years or less. |
| $DM_{WP-herb,t}$ | This is the average non-woody biomass in the project scenario in year *t*. It is derived from plot-based sampling for the calculation of project emissions using the area-based approach. |
| $n_{burn,t}$ | This is an integer of the number of sampled planting units recorded as burned in the monitoring interval ending in year *t*. It is derived from field sampling and monitored every 5 years or less. |
| $U_{p,t}$ | This is the percentage uncertainty in carbon stock estimate of pool *p* in the project scenario in year *t*. This is derived from field sampling and monitored every 5 years or less. |
| $A_{burn,t}$ | This is the area burned in the monitoring interval ending in year *t*, measured in hectares. This is calculated from GIS data every 5 years or less. |
| $M_{wp,SF,t}$ | This is the mass (t) of synthetic fertilizer applied in the project, derived from land management records. This is monitored at least every five years or prior to each verification event, if that occurs sooner. |
| $M_{wp,OF,t}$ | This is the mass (t) of organic fertilizer applied in the project, derived from land management records. This is monitored at least every five years or prior to each verification event, if that occurs sooner. |
| $NC_{wp,SF,t}$ | This is the nitrogen content of synthetic fertilizer applied in the project in year *t*. This will be derived from management records and manufacturer's specifications at least every 5 years, or prior to each verification event, if that occurs sooner. |
| $NC_{wp,OF,t}$ | This is the nitrogen content of organic fertilizer applied in the project in year *t*. This will be derived from management records and manufacturer's specifications at least every 5 years, or prior to each verification event, if that occurs sooner. |
| $B_{SDW,t}$ | This is the average biomass of standing dead wood in year *t*, measured in t d.m. per hectare. This is derived from plot-based sampling every 5 years or less. |

| | |
|---|---|
| $B_{LDW,t}$ | This is the average biomass of lying dead wood in year *t*. It is derived from field measurements a variety of approved sampling techniques. It is monitored every 5 years or less. |
| $DM_{WP\text{-}LI,t}$ | This is the average litter dry mass per hectare in the project scenario in year *t*. It is measured as t dm per hectare and monitored every 5 years or less. |
| $C_{WP\text{-}SOC,t}$ | This is the average soil organic carbon (SOC) stock in year *t*. It is measured as t C per hectare directly from field measurements within the project area. SOC may be monitored less frequently than other pools at 10-year intervals, where it is accounted for as zero at intermittent 5-year verification events. |
| $SI_{control,t}$ and $SI_{wp,t}$ | This is the stocking index in scenario (remotely-sensed control plot *j,i* or remotely-sensed project plot *i*) at time *t*. It is an unspecified remote sensing metric that must be significantly correlated to terrestrial carbon stocks and validated with direct measurements from the project region. |

## 3.11 Uncertainty

The methodology requires field-based sampling for both area and census-based approaches to estimate the carbon stock in woody biomass, non-woody biomass, dead wood, litter, and soil organic carbon, as well as the mortality rate when using the census-based approach. This necessitates addressing both efforts to reduce systematic and random errors and to account for unavoidable random error. Firstly, systematic errors are reduced by requiring sampling to employ conventional inventory sampling design approaches (e.g., use of probabilistic sampling with known probabilities of selection) that are unbiased and accompanied by verifiable, written standard operating procedures with QA/QC procedures. Secondly, uncertainty is calculated using the t-score distribution at a 90% confidence level; the use of a t-score as opposed to z-score ensures projects are incentivized to increase precision through careful inventory design and by increasing sampling effort, Thirdly, to increase accuracy of carbon stock calculations, the methodology gives explicit guidance on acceptable sources for allometric equations, where allometry is required to estimate biomass and carbon mass from field-measurements (e.g., diameter-at-breast height to biomass conversions and the root-shoot ratio of woody biomass).

The assessment team confirmed that the methodology outlines the computation of uncertainty. Combined uncertainty is computed differently for the census-based approach versus the area-based approach. For the area-based approach, sources of uncertainty include sampling error of estimating the average carbon density of each carbon stock pool within each carbon stock pool, which includes woody biomass, non-woody biomass, dead wood, litter and soil organic carbon. The methodology includes an equation to calculate the uncertainty in cumulative greenhouse gas removals using common statistical practice to propagate uncertainty across all pools and across two time periods, at the initiation of the project and at the time of monitoring, accounting for the change in greenhouse gas removals due to project activities. For the census-based

approach uncertainty accounts for sampling error of estimating the average carbon density of the woody biomass pool; uncertainty for the census-basis additionally accounts for uncertainty of estimating the rate of mortality of woody biomass plantings. The methodology includes an equation for account for propagation of error in order to pool uncertainties of both carbon stocks and mortality rates. The assessment team confirms with reasonable assurance that the uncertainty equations in the methodology are appropriate, adequate and conform with the VCS Program rules.

### 3.12 Verifiable

After completion of the full methodology assessment, the assessment team confirms with *reasonable* assurance that the methodology is sufficiently clear and specific to require project developers to transparently report project results that can pass validation and verification audits with high confidence.

# 4 ASSESSMENT CONCLUSION

Aster Global Environmental Solutions, Inc., has completed the methodology assessment of VM0047 Afforestation, Reforestation and Revegetation (Version 1.0, dated 28 September 2023). The assessment team confirms the methodology adheres to the criteria established for this methodology assessment, which are documented and complete. Aster Global concludes without any qualifications or limiting conditions that the methodology documentation meets the requirements of the VCS Program Guide, VCS Methodology Requirements, and the VCS Methodology Development and Review Process. Therefore, Aster Global recommends that Verra approve the methodology (VM0047 Methodology for Afforestation, Reforestation and Revegetation, V1.0, 28 September 2023) as prepared by Verra.

# 5 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

As stated in the VCS Methodology Development and Review Process, “The criteria for eligible validation/verification bodies are set out in Section 5 of the VCS Program Guide.”[9]

Further, the Program Guide Section 5 states “Validation/verification bodies are also eligible to conduct methodology assessments (validation) of methodologies under the methodology development and review process. The validation/verification body shall hold accreditation for validation for the sectoral scope(s) applicable to the methodology. Where the methodology falls

[9] VCS Methodology Development and Review Process, v4.3, 29 August 2023, Page 10

under more than one sectoral scope, the validation/verification body shall hold accreditation for validation for all relevant sectoral scopes. Validation/verification bodies shall ensure the assessment team includes experts with subject-matter expertise in all areas relevant to the proposed project activity. Validation/verification bodies may contract external experts where needed to meet this requirement."[10]

Aster Global fulfils the eligibility requirements in the following ways:

- Aster Global is accredited by the ANSI National Accreditation Board (ANAB) under the following:

| | |
|---|---|
| Rank | ISO/IEC 17029:2019 expires 08 March 2027 Certificate Here |
| Environmental Information | ISO 14065: 2020 |
| Greenhouse Gas | ISO 14064-3:2019 |
| Project Level Verification of Assertion related to GHG emissions reductions and removals | |
| Group 01 | GHG emission reductions from fuel combustion |
| Project Level Verification/Validation of Assertion related to GHG emissions reductions and removals | |
| Group 03 | Land Use and Forestry, subgroup ART TREES |
| Group 05 | Livestock |
| Group 06 | Waste Handling and Disposal |
| Organization Level Verification of assertions related to GHG emissions and removals | |
| Group 01 | General, subgroup CORSIA |
| Group 02 | Manufacturing |
| Group 03 | Power Generation |
| Group 05 | Mining and Mineral Production |
| Group 06 | Metals |
| Group 07 | Chemical Production |
| Group 08 | Oil and gas extraction, production and refining, including petrochemicals |
| Group 09 | Waste |

- Aster Global utilized Shawn McMahon (WRC non-peatlands, IFM, ALM, and REDD expert) and Barbara Toole O'Neil (Standardized Methods expert) as VCS-approved experts who participated in the comprehensive review. Aster Global also utilized an internal soil scientist, remote sensing expert, and forest biometricians with experience in relevant aspects of the methodology assessment.

- To date, Aster Global has completed greater than 18 VCS methodology assessments under AFOLU and is currently assessing 3 additional VCS methodologies.

[10] VCS Program Guide, V4.4, 29 August 2023, Page 14

# 6 SIGNATURE

Signed for and on behalf of:

Name of entity: Aster Global Environmental Solutions, Inc.

Signature: 

Name of signatory: Shawn McMahon

Date: 25 September 2023

# APPENDIX A: LIST OF DOCUMENTS RECEIVED FROM CLIENT

| Name | Received |
|---|---|
| VCS ARR Methodology 3May2022 CLEAN (1).pdf | 6/10/2022 |
| Versions before public consultation | 6/10/2022 |
| ARR Leakage Tool_Rev_31March2022.docx | 6/10/2022 |
| VCS ARR Methodology (1).docx | 6/10/2022 |
| ARR Leakage Tool (1).docx | 6/10/2022 |
| VCS ARR Methodology 3May2022 CLEAN (1).docx | 6/10/2022 |
| ARR Leakage Tool_Rev_31March2022.pdf | 6/10/2022 |
| VCS ARR Methodology APPENDIX 11May2022 CLEAN (2).pdf | 6/10/2022 |
| ARR Methodology and Leakage Tool Public Consultation comments DTS and SS responses_08 June 2022.xlsx | 7/20/2022 |
| ARR_performance benchmark demo 21Jun2022.xlsx | 7/21/2022 |
| Versions Before Public Consultation | 7/21/2022 |
| ARR Leakage Tool (1).docx | 7/21/2022 |
| VCS ARR Methodology (1).docx | 7/21/2022 |
| ARR Leakage Tool_Rev_29April2022_clean.docx | 8/3/2022 |
| VCS ARR Methodology 12Aug2022 rev.docx | 8/15/2022 |
| VCS ARR Methodology APPENDIX 12Aug2022 CLEAN.docx | 8/15/2022 |
| VCS ARR Methodology APPENDIX 12Aug2022.docx | 8/15/2022 |
| RE__22036.00_-_Performance_Benchmark_Example | 8/29/2022 |
| ARR_PB_over_time.csv | 8/29/2022 |
| WLS_ARR_over_time_20220818.R | 8/29/2022 |
| ARR_performance benchmark demo 17Aug2022.xlsx | 9/7/2022 |
| VCS ARR Methodology 12Aug2022 rev CLEAN.docx | 9/28/2022 |
| Verra ARR | 12/22/2022 |
| expert consult | 12/22/2022 |
| leakage tool | 12/22/2022 |
| SOC loss | 12/22/2022 |
| Calhoun demo.xls | 12/22/2022 |
| Mobley_ML2015 Surficial_gains_and_subsoil_losses_of_so.pdf | 12/22/2022 |
| Open Notebook.onetoc2 | 12/22/2022 |
| Richter et al 1999.pdf | 12/22/2022 |
| VCS ARR Methodology APPENDIX Oct2022rev.docx | 12/22/2022 |
| ARR Expert Consultation Report.docx | 12/22/2022 |
| Smith et al demo.xls | 12/22/2022 |

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|---|---|
| FCI WG Baselines_Additionality and Jurisdictional_Landscape Approaches Background Paper - updated with key takeaways .docx | 12/22/2022 |
| Forest Carbon Innovations TOR 2020 6 25.docx | 12/22/2022 |
| Key takeaways from FCI WG meeting #9.docx | 12/22/2022 |
| VCS ARR Methodology Oct2022rev.docx | 12/22/2022 |
| Meeting #9 - ARR & agroforestry.pdf | 12/22/2022 |
| Open Notebook.onetoc2 | 12/22/2022 |
| VCSAF_ARR_MethodologyReview_20220126.pdf | 12/22/2022 |
| Blanco-Canqui and Wortmann - 2020 - Does occasional tillage undo the ecosystem service.pdf | 12/22/2022 |
| VCS ARR Methodology rev1Oct CLEAN_gl_dts.docx | 12/22/2022 |
| VCS ARR Methodology rev1Oct CLEAN_SCP DTS.docx | 12/22/2022 |
| Conant et al. - 2007 - Impacts of periodic tillage on soil C stocks A sy.pdf | 12/22/2022 |
| Crawford et al. - 2014 - Changes in the soil quality attributes of continuo.pdf | 12/22/2022 |
| Cooper et al 2016.pdf | 12/22/2022 |
| Dynarski et al. - 2020 - Dynamic Stability of Soil Carbon Reassessing the .pdf | 12/22/2022 |
| Kettler et al. - 2000 - Soil Quality Assessment after Weed-Control Tillage.pdf | 12/22/2022 |
| Kirkegaard et al. - 2020 - Strategic tillage of a long-term, no-till soil has.pdf | 12/22/2022 |
| Open Notebook.onetoc2 | 12/22/2022 |
| 22036.00 Leakage Module Preliminary Round 1 Findings_with_Public_Comments_SS.xlsx | 12/22/2022 |
| VandenBygaart and Kay - 2004 - Persistence of Soil Organic Carbon after Plowing a.html | 12/22/2022 |
| Appendix 1 - Leakage Example_20 December.xlsx | 12/22/2022 |
| ARR Leakage Tool_Rev_20 December.docx | 12/22/2022 |
| Open Notebook.onetoc2 | 12/22/2022 |
| Wortmann et al. - 2010 - One-Time Tillage of No-Till Crop Land Five Years P.html | 12/22/2022 |
| Supporting Analysis for Share of Leakage .docx | 12/22/2022 |
| weighting demo.xlsx | 12/27/2022 |
| 22036.00_Verra ARR Methodology Assessment_Round 1 Findings_Revised TC responses.xlsx | 1/4/2023 |
| SOC recovery tillage.xlsx | 1/4/2023 |
| expert consult | 1/25/2023 |
| leakage tool | 1/25/2023 |
| SOC loss | 1/25/2023 |
| Blanco-Canqui and Wortmann - 2020 - Does occasional tillage undo the ecosystem service.pdf | 1/25/2023 |
| SOC recovery tillage.xlsx | 1/25/2023 |
| Conant et al. - 2007 - Impacts of periodic tillage on soil C stocks A sy.pdf | 1/25/2023 |
| Cooper et al 2016.pdf | 1/25/2023 |
| Crawford et al. - 2014 - Changes in the soil quality attributes of continuo.pdf | 1/25/2023 |

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| Dynarski et al. - 2020 - Dynamic Stability of Soil Carbon Reassessing the .pdf | 1/25/2023 |
| Kettler et al. - 2000 - Soil Quality Assessment after Weed-Control Tillage.pdf | 1/25/2023 |
| VandenBygaart and Kay - 2004 - Persistence of Soil Organic Carbon after Plowing a.html | 1/25/2023 |
| Wortmann et al. - 2010 - One-Time Tillage of No-Till Crop Land Five Years P.html | 1/25/2023 |
| Kirkegaard et al. - 2020 - Strategic tillage of a long-term, no-till soil has.pdf | 1/25/2023 |
| ARR Leakage Tool_Rev_20 December.docx | 1/25/2023 |
| Supporting Analysis for Share of Leakage .docx | 1/25/2023 |
| Forest Carbon Innovations TOR 2020 6 25.docx | 1/25/2023 |
| Key takeaways from FCI WG meeting #9.docx | 1/25/2023 |
| Meeting #9 - ARR & agroforestry.pdf | 1/25/2023 |
| ARR Expert Consultation Report.docx | 1/25/2023 |
| VCS ARR Methodology rev1Oct CLEAN_gl_dts.docx | 1/25/2023 |
| VCSAF_ARR_MethodologyReview_20220126.pdf | 1/25/2023 |
| FCI WG Baselines_Additionality and Jurisdictional_Landscape Approaches Background Paper - updated with key takeaways .docx | 1/25/2023 |
| VCS ARR Methodology rev1Oct CLEAN_SCP DTS.docx | 1/25/2023 |
| weighting demo.xlsx | 1/25/2023 |
| Richter et al 1999.pdf | 1/25/2023 |
| Mobley_ML2015 Surficial_gains_and_subsoil_losses_of_so.pdf | 1/25/2023 |
| Calhoun demo.xls | 1/25/2023 |
| Smith et al demo.xls | 1/25/2023 |
| 22036.00_Verra ARR Methodology Assessment_Round 1 Findings_Revised TC responses add Jan23.xlsx | 1/25/2023 |
| VCS ARR Methodology Jan2023rev.docx | 1/25/2023 |
| 22036.00 Leakage Module Preliminary Round 1 Findings_with_Public_Comments_SS.xlsx | 1/25/2023 |
| VCS ARR Methodology APPENDIX Jan2023rev.docx | 2/15/2023 |
| VCS ARR Methodology APPENDIX 11May2022 CLEAN (2).docx | 2/27/2023 |
| VCS ARR Methodology APPENDIX Jan2023rev CLEAN.docx | 2/28/2023 |
| Appendix 1 - Leakage Example_20 December.xlsx | 3/2/2023 |
| VCS ARR Methodology Jan2023rev CLEAN.docx | 3/8/2023 |
| Round 2 | 3/13/2023 |
| Round 2 Versions_Unformatted_Originals | 3/13/2023 |
| lieurance2018.pdf | 3/13/2023 |
| Past_as_prologue_An_innovation-diffusion_approach_.pdf | 3/13/2023 |
| 22036.00_Verra ARR Methodology Assessment_Round 2 Findings TC response.xlsx | 3/13/2023 |
| VCS ARR Methodology APPENDIX round 2 rev_formatted.docx | 3/13/2023 |
| VCS ARR Methodology round 2 rev.docx | 3/13/2023 |
| VCS ARR Methodology round 2 rev_formatted.docx | 3/13/2023 |
| VCS ARR Methodology APPENDIX round 2 rev.docx | 3/13/2023 |

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| Round 2 Revision | 3/21/2023 |
| ARR Leakage Tool_Marked and Unformatted_20 March.docx | 3/21/2023 |
| ARR Leakage Module_Formatted_20 March.docx | 3/22/2023 |
| 22036.00_Verra ARR Methodology Assessment_Round 2 Findings TC_SP response_.xlsx | 3/27/2023 |
| 22036.00 Leakage Module Round 2 Findings_TC responses.xlsx | 4/13/2023 |
| 22036.00 Leakage Module Round 3 Findings Final 20230404_TC.xlsx | 4/27/2023 |
| 22036.00_Verra ARR Methodology Assessment_Round 3_draft_20230423_TC responses.xlsx | 4/27/2023 |
| ARR Leakage Module_TC_Marked_April 9.docx | 4/27/2023 |
| VCS ARR Methodology round 3 rev.docx | 4/27/2023 |
| VCS ARR Methodology APPENDIX round 3 rev.docx | 4/27/2023 |
| nfu-rszx-gyp (2023-04-25 14 19 GMT-4).mp4 | 4/27/2023 |
| VCS ARR Methodology round 3 rev 5May2023.docx | 5/8/2023 |
| ARR Leakage Module_Marked_May 12.docx | 5/15/2023 |
| ARR Leakage Module_Marked_May 15.docx | 5/17/2023 |
| 22036.00 Leakage Module Round 4 Findings Final 20230515_TC.xlsx | 5/17/2023 |
| 22036.00 Leakage Module Round 4 Findings Final 20230515 TC responses.xlsx | 6/12/2023 |
| ARR Leakage Module round 4 rev_SP_20230612.docx | 6/12/2023 |
| VCS ARR Methodology APPENDIX round 4 rev.docx | 6/12/2023 |
| VCS ARR Methodology round 4 rev_SP20230609.docx | 6/12/2023 |
| VCS ARR Methodology round 4 rev_SP20230609 DTS.docx | 6/16/2023 |
| VCS ARR Methodology round 4 rev_SP20230609 DTS20230619.docx | 6/22/2023 |
| ARR_Leakage Module_VVB_FinalReview.docx | 8/16/2023 |
| ARR_Methodology_VVB_FinalReview_20230816.docx | 8/23/2023 |
| 22036.00_Verra ARR Methodology Assessment_Round 4_20230522 TC responses 20230612.xlsx | 8/28/2023 |
| ARR_Methodology_VVB_FinalReview_20230829.docx | 8/30/2023 |
| ARR Table 1_ Annotated .docx | 8/30/2023 |
| ARR_Methodology_VVB_FinalReview_20230830.docx | 9/1/2023 |
| ARR_Methodology_VVB_FinalReview_20230906.docx | 9/7/2023 |
| 22036.00 ARR Meth Docs List.xlsx | 9/12/2023 |
| query (5).iqy | 9/12/2023 |
| ARR_Methodology_VVB_FinalReview_20230915.docx | 9/22/2023 |
| VMD0054_ARR_Leakage Module_VVB Review_Final_20230922.docx | 9/22/2023 |
| ARR_Methodology_VVB_FinalReview_20230915.docx | 9/25/2023 |
| VM0047_ARR_Methodology_VVB Review_Final.pdf | 9/25/2023 |
| VMD0054_ARR_Leakage Module_VVB Review_Final.pdf | 9/25/2023 |

# APPENDIX B: LIST OF FINDINGS

| Item Number | 1 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **2.2.1** Methodologies may employ a modular approach in which a framework document provides the structure of the methodology and separate modules and/or tools are used to perform specific methodological tasks. Such methodologies shall use the VCS Methodology Template for the framework document and the VCS Module Template for the modules and tools. The framework document shall clearly state how the modules and/or tools are to be used within the context of the methodology. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Leakage Module, Meth template from VCS website |
| Aster Global Round 1 Findings | It is unclear which version of the VCS Methodology Template is utilized (for both the framework document and the Leakage Module), as presumably required text in the header is overwritten by the Methodology title. It's unclear if the intent of the embedded header text to the far right is to be changed by a Methodology Developer. However, since no explicit requirement is described in the template, the assessment team is not requesting the header be changed, but a clarification is needed to ensure the appropriate template version was used. |
| Round 1 NCR/CL/OFI | CL: Please clarify if the required template version 4.1 was used. |
| Round 1 Response from Methodology Developer | It appears the most recent version (v4.1) of the methodology template was used. Final formatting by a technical editor will address any inconsistencies. We have removed the "Sectoral Scope 14" from the header. |
| Aster Global Findings - Round 2 | Since issuing the original Finding, a newer version of the Methodology Template (v4.2, dated 21 December 2022) has been released. There may be a grace period to utilize this template, as Verra explicitly stated there is a grace period for projects to use the PD and MR templates in its online training for the December VCS updates (April 1st, 2023). Although, they stated they appreciated projects use the new templates as soon as possible. However, it is unclear if that statement also applies to the individual Methodology Template. Further, the Methodology Template itself appears to have errors in the version number in the Header. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please confirm this methodology is not required to utilize the newest VCS template (V4.2). This item will be pending review of the final Methodology document. |
| Round 2 Response from Methodology Developer | The header is now included and has been updated to the correct version(4.2) from what appears in the template(4.1). Note that during final technical edit the headers will be replaced with the corresponding methodology number, which has yet to be assigned and therefore cannot be inserted yet. |
| Aster Global Findings - Round 3 | The assessment team confirmed that the header has been appropriately updated in the current version of the methodology. The onus will be on Verra to ensure that the methodology complies with all template requirements following the final technical edit. Item closed. |

| Item Number | 2 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.2.3** Methodologies may use any combination of project, performance or activity methods for determining additionality and the crediting baseline. However, methodologies shall provide only one method (i.e., a project method or performance method) for determining the crediting baseline (i.e., methodologies shall not provide the option of using either a project method or a performance method for the crediting baseline). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how this requirement is satisfied, as it appears the methodology provides an option of using either a project method or a performance method for determining the crediting baseline. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the assessor findings. |
| **Round 1 Response from Methodology Developer** | Verra interprets this rule to mean that only one method for quantifying a crediting baseline is provided for each quantification approach within the methodology. The criteria for electing the appropriate quantification approach have been updated to reflect that one or the other approach must be used for each project instance. There is now in Table 1 a clear condition for assigning the quantification approach (re whether the ARR activity will achieve continuous vegetative cover on any contiguous area exceeding 1 hectare (i.e. can be clearly delineated spatially); i.e. the PP does not have the option to decide which approach to apply. |
| **Aster Global Findings - Round 2** | The clarification and changes made to the methodology are sufficient to close this finding. Item closed. |
| **Aster Global Findings - Round 6** | The previous applicability condition for the census-based approach limited census-based projects to continuous planting on no greater than 1-hectare parcels. With the removal of that item, the new applicability conditions do not limit the census-based approach to 1 hectare. Though the area-based approach applicability condition states "ARR activities produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare," that does not put the same limits on the census-based approach. |
| **Round 6: NCR/CL/OFI** | CL: Please add the one-hectare maximum limitation to the census-based applicability condition, or further clarify why you think it is not necessary. It does not appear redundant to the assessment team to include it, as the implications are different for the two approaches. |
| **Round 6 Response from Methodology Developer** | Revised language in Applicability Conditions from: “Project activity must not produce a change in land cover classification (e.g., from non-forest to forest) on any contiguous area exceeding one hectare.” to, “Project activity must not produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare.” |
| **Aster Global Final Findings** | The changes are sufficient to address the finding. Item closed. |

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| **Item Number** | 2.1 |

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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **2.2.4** A standardized method shall be used as the preferred option for determining additionality. Where a methodology does not employ a standardized method for additionality, the proponent shall provide a justification for why such an approach is not appropriate or possible |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Findings - Round 2 | A standardized approach is used for determining additionality for the performance benchmark method. A project method is also allowed. The assessor notes there is no justification for why such an approach (standardized) is not appropriate or possible. Please note this relates to a public comment #52. Please note this is a new requirement from V4.3. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please provide justification for why a standardized approach is not utilized for the census-based additionality approach. |
| Round 2 Response from Methodology Developer | The standardized, area-based approach outlined in this methodology demands precise area determination and remote sensing interpretation, which is not (yet) feasible at the scale of individual planting units. |
| Aster Global Findings - Round 3 | The requirements states that a justification as to why such an approach is not appropriate/possible. The assessment team determined that the justification provided is valid. Item closed. |

| Item Number | 3 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **2.3.5 Project-established performance methods include:** 1) Dynamic performance benchmarks: Dynamic performance benchmarks are based on a comparison between paired control data (representing the baseline scenario and used to determine baseline emissions and baseline carbon stocks) and monitored data (representing the project scenario). The methodology establishes the performance benchmark metric (as defined per Section 2.3.9), the level of the performance benchmark metric (as a proportional improvement in comparison to the control data) and the procedure for projects to determine the greenhouse gas level of the performance benchmark metric (in tCO2e). Dynamic performance benchmarks require projects to update the control data, and therefore the crediting baseline, within the project crediting period or AFOLU baseline period, as appropriate. The methodology shall include a procedure for projects to determine the performance benchmark, including requirements for: |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A: Performance Method |

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| **Aster Global Round 1 Findings** | Performance benchmarks are based on comparison between carbon stocks in remotely sensed control plots, relative to remotely sensed project plots.<br><br>According to this requirement, after the methodology establishes the performance benchmark proportionality, it must further establish the final procedure that results in tCO2e. Per Equation 33, the final result of the performance benchmark that is input into the equation is the unit of percent, not tCO2e. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify why the methodology's performance benchmark quantification does not result in a final unit of tCO2e. This finding may be pending a meeting the assessor requested with Verra to address the performance benchmark. |
| **Round 1 Response from Methodology Developer** | The performance benchmark calculated in Appendix eq A6 is the ratio of average annual change in stocking index in control plots vs project plots, expressed as a percentage. It is a comparative assessment of proportional stock change in t CO2e. The first step was designed to avoid direct reporting of t CO2e of baseline control points, acknowledging the current limits of remote sensing. In the second step, the PB value is applied in methodology eq 33 as Cwp * (1-PB). At this point, the PB (a %) is applied to an estimate of direct-measured t CO2e stock change, and effectively is converted in the equation to units of t CO2e. I.e. Cwp * (1-PB) is the same as Cwp – Cwp*PB, and output of Cwp*PB would be in units of CO2e (= "greenhouse gas level of the performance benchmark metric"). While the approach does not produce an explicit, independent term representing the performance benchmark in units of t CO2e, the equation result meets the intent of VCS methodology requirements 2.3.5. In fact, Table 1 of the VCS methodology requirements specifies that the performance benchmark level be expressed "As a proportional change in comparison to the control data (e.g., 10% above average carbon stock per hectare in control data)", which is how the PB in its current form is constructed (with stocking index substituting for carbon stock). |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to address this finding. Item closed. |

| **Item Number** | 4 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.3.7** Methodologies may use a performance method for determining additionality only, for determining additionality and the crediting baseline, or for determining the crediting baseline only. The level of the performance benchmark metric for determining additionality and for the crediting baseline may be the same, or each may be different. Where they are different, the level for determining additionality shall be more stringent than the level of the crediting baseline. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Performance method can be used for both, determining additionality and the crediting baseline. However, it is unclear if the requirement "the level for determining additionality shall be more stringent than the level of the crediting baseline" has been achieved. |

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| **Round 1 NCR/CL/OFI** | CL: Please demonstrate/explain how this requirement has been achieved. |
| **Round 1 Response from Methodology Developer** | The PB for crediting baseline and demonstration of additionality are not different. Additionality section now references Appendix A equation A5 to test for additionality (significance of departure from controls via Z test). Additionality is set at a more stringent level than the crediting baseline because additionality assessment accounts for uncertainty in the project and baseline. The project must demonstrate that its rate of carbon stock change is significantly different the baseline in order to be consider additional and allowing crediting. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to address this finding. Item closed. |

| **Item Number** | 5 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.3.9** The performance benchmark metric shall be specified in terms of one of the following, as appropriate to the project activity applicable under the methodology:<br>1) Tonnes of CO2e per unit of output (i.e., GHG emissions per unit of product or service);<br>2) Tonnes of CO2e per unit of input (e.g., GHG emissions per unit of input per unit of land area);<br>3) As a sequestration metric (e.g., carbon stock per unit of land area), or;<br>4) As a carbon stock change metric (e.g., change in carbon stock per unit of land area). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology, APPENDIX A: PERFORMANCE METHOD |
| **Aster Global Round 1 Findings** | The performance benchmark metric is specified as a proportional improvement in project plots data comparison to the control plots data. It is unclear how the unitless percentage performance benchmark satisfies one of these four elements. It is also unclear if the performance benchmark covers all required pools for the project. |
| **Round 1 NCR/CL/OFI** | CL: Please address the finding. |

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| **Round 1 Response from Methodology Developer** | The performance benchmark is derived from remote sensing with demonstrated correlation with aboveground biomass, but employs the (logical) assumption that gains in aboveground biomass are correlated with gains in all other pools (including dead wood, litter, SOC ...), as these inputs are derived from aboveground biomass. Aboveground biomass is also by far the most significant pool is these ARR systems. The assumption would be tenuous if we were interested in estimating stocks of these other pools, but we're not, we're interested in relative gains in stocks resulting from ARR, which should be proportional to relative gains in AGB. Also, and importantly, the performance benchmark represents relative gains applied to direct measured stocks, and so assumes that gains (or losses) among pools are proportional (not that the relative sizes of component pools are proportional). In the "Smith et al demo" file, we have run a demonstration with afforestation yield tables from Smith et al 2006 (control with 5 yr lag and 10% reforestation in yr 5), and compared emission reductions calculated two ways: (1) with treatment direct measured * (1-PB) (per methodology approach using AGB only to inform PB), and (2) direct estimates of treatment – control. We have also run a demonstration (tab "lob demo SOC cap") where with-project SOC is capped at yr 20, but control sites host continued accumulation (the kind of site level soil differences that might not be captured in matching), and a demonstration (tab "lob demo SOC^") where SOC increment represents a greater proportion of total stock increase (AGB increment * 0.5 and SOC increment * 2). All results closely match and support the current application of PB as the ratio of rates of change of AGB, applied across direct-measured with project pools. We have also run the same comparison with an empirical dataset from the Calhoun forest in South Carolina ("Calhoun demo", 40 years of loblolly growth on old field, with measurements of live tree biomass, litter and CWD and mineral soil carbon in the top 7.5 cm), showing the same results (good alignment of PB application and direct estimates of treatment-control). Further, the performance benchmark is derived as a ratio of rate of change applied to a direct measurement of carbon stocks in the project, which reflects a linear rate of changes in the without-project scenario. This approach specifies the performance benchmark metric as a carbon stock change metric, which aligns with option (4) provided in section 2.3.9. |
| **Aster Global Findings - Round 2** | The assessment team determined the metric of the performance benchmark is appropriate. Specifically, the methodology developers have demonstrated correlation with total pooled carbons stock and pools for which remote sensing products are more sensitive to (e.g. aboveground woody biomass). The assessment team finds no signficant issues with this demonstration. Thus, the assessment team is assured the derivation of the performance benchmark satifies the performance metric serves as a carbon stock change metric. Full closure of this item is pending response to Finding 21<br><br>The finding upon which this item was pending has been addressed. Clarification provided by the methodology developer regarding equivalency of pools was sufficient to close that finding. Item closed. |

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| **Item Number** | 6 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | The performance benchmark metric may represent tonnes of CO2e reduced or tonnes of CO2e sequestered. An input metric shall only be used where an output metric is not practicable (e.g., the corresponding output metric is subject to influences outside the control of the project proponent) and leakage shall be addressed. A carbon stock change metric shall only be used where a dynamic performance benchmark is established following the requirements set out in Section 2.3.5. The unit shall be unambiguously defined to allow a consistent comparison of project performance with the performance benchmark. The GHG Protocol for Project Accounting, Chapter 7 (WRI-WBCSD) provides some examples of products and services that may serve as candidates for performance benchmark metrics. Note that proxies for the performance benchmark metric may be used for determining additionality, as set out in Section 3.5.7 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology, APPENDIX A: PERFORMANCE METHOD |
| **Aster Global Round 1 Findings** | Normalized Degradation Fraction Index and average canopy height derived from Lidar may serve as remote sensing metric for performance benchmark metric.<br><br>It is unclear if the Performance Benchmark, as written, satisfies the criteria, specifically, "The unit shall be unambiguously defined to allow a consistent comparison of project performance with the performance benchmark." The assessor is not clear how the unitless percentage will be unambiguous and ensure consistency with any given project. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | Despite SI being a unitless metric, the procedures to derive SI are made clear and consistent in Appendix A, and applied equally to calculate delta_SI_wp and delta_SI_control (from which the performance benchmark is calculated). Comparisons thus will be consistent throughout reporting. Also, as explained in response to finding #3, the unitless SI ratio is applied to delta_C_wp and effectively converted to units of tCO2e. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to address this finding. Item closed. |

| **Item Number** | 7 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 2) Methodologies that establish procedures and requirements for dynamic performance benchmarks shall justify the level of the performance benchmark metric in comparison with control data and demonstrate how the selected level does not systematically overestimate GHG emission reductions or removals. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology, APPENDIX A: PERFORMANCE METHOD |

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| **Aster Global Round 1 Findings** | The methodology (Appendix A) includes a set of requirements (factors) to assess control area eligibility. The factors include Jurisdictional boundary, Ecoregion, Policy environment, Outside any registered AFOLU project, Initial land use/land cover with potential for vegetative growth, and Land tenure.<br><br>The appendix does not appear to discuss "how" the selected level does not systematically overestimate GHG emission reductions or removals. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | The performance benchmark now employs a significance test to demonstrate differences between project and controls, and reject cases of false positives. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to address this finding. Item closed. |

| **Item Number** | 8 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 3) The process of determining the level(s) of the performance benchmark metric for all types of performance benchmarks shall include and be informed by an expert consultation process, undertaken by the methodology developer as follows: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | |
| **Aster Global Round 1 Findings** | The assessment team has not been provided evidence substantiating that this process has occurred. |
| **Round 1 NCR/CL/OFI** | CL: Please provide the assessment team with the necessary evidence needed to satisfy all sub-requirements of this requirement. |
| **Round 1 Response from Methodology Developer** | The expert consultation process is documented in "ARR Expert Consultation Report.doc" |
| **Aster Global Findings - Round 2** | The assessment team was provided a folder documenting the expert consultation process. After review of "ARR Expert Consultation Report.doc" and provided documentation, the assessment team determined that the expert consultation process has been appropriately conducted. This item is closed. |

| **Item Number** | 8.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | *2.3.11 Where there is heterogeneity of performance (measured in terms of the performance benchmark metric) that may be practicably achieved by individual projects, multiple benchmarks or correction factors may be required. Multiple benchmarks or correction factors shall be established under the following circumstances:*<br><br>2) The methodology encompasses both larger and smaller scale project activities and the performance (measured in terms of the performance benchmark metric) that may be practicably achieved in each case is substantially different. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Findings - Round 3** | This item was recently assessed by the standardized methods expert after changes and additions to the revised methodology. It is still unclear how the methdodology achieves these requirements. |
| **Round 3: NCR/CL/OFI** | CL: Please demonstrate how the methodology achieves this requirement when there is heterogeneity of performance. |
| **Round 3 Response from Methodology Developer** | The selection of control plots for the performance benchmark accounts for heterogeneity in performance by matching controls to treatments on the basis of a specified range of similarity criteria that are known to be predictors of performance. The methodology ensures that the controls are sufficiently well-matched to the project area, applying a Standardized Difference of Means (SDM) threshold as a measure of covariate balance (essentially that there is generous overlap in the distributions of similarity criteria values between the controls and project). |
| **Aster Global Findings - Round 4** | Due to the nature of the methodology's performance benchmark, heterogeneity of performance will be differentiated in large-scale versus small-scale activities via the matching criteria. This item is addressed. |

| **Item Number** | 8.2 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | *2.3.11 Where there is heterogeneity of performance (measured in terms of the performance benchmark metric) that may be practicably achieved by individual projects, multiple benchmarks or correction factors may be required. Multiple benchmarks or correction factors shall be established under the following circumstances:*<br><br>3) Any other circumstances related to the baseline scenario or project activity, such as plant age, raw material quality and climatic circumstances, that lead to heterogeneity of performance (measured in terms of the performance benchmark metric) that may be practicably achieved by individual projects. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Findings - Round 3** | This item was recently assessed by the standardized methods expert after changes and additions to the revised methodology. It is still unclear how the methdodology achieves these requirements. |
| **Round 3: NCR/CL/OFI** | CL: Please demonstrate how the methodology achieves this requirement when there is heterogeneity of performance. |
| **Round 3 Response from Methodology Developer** | The selection of control plots for the performance benchmark accounts for heterogeneity in performance by matching controls to treatments on the basis of a specified range of similarity criteria that are known to be predictors of performance. The methodology ensures that the controls are sufficiently well-matched to the project area, applying a Standardized Difference of Means (SDM) threshold as a measure of covariate balance (essentially that |

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| | there is generous overlap in the distributions of similarity criteria values between the controls and project). |
| **Aster Global Findings - Round 4** | Due to the nature of the methodology's performance benchmark, heterogeneity of performance will be differentiated in any other additional activities via the matching criteria. This item is addressed. |

| **Item Number** | 9 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.4.1** Methods used for estimating random error shall be based on recognized statistical approaches such as those described in the latest IPCC guidance.2<br>2 At the time of writing, guidance on uncertainties is included in Volume 1, Chapter 3 of the 2019 Refinement to the 2006 IPCC Guidelines for National GHG Inventories (https://www.ipcc-nggip.iges.or.jp/public/2019rf/vol1.html). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 9 |
| **Aster Global Round 1 Findings** | These new requirements on uncertainty were approved with the v4.2 Methodology Requirements revisions. It is unclear if the methodology conforms to these new requirements, and where the analysis has occurred. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | Uncertainty is addressed in section 8.4 in the main methodology, and in the statistical tests in the appendix. Uncertainty has been reframed to a 10% of the mean threshold with 90% confidence, to align with new VCS methodology requirements. |
| **Aster Global Findings - Round 2** | The assessment team finds that Uncertainty is determined in line with VCS methodology requirements; however, findings have been raised with regards to determination of Up for various carbon pools. This finding is pending resolution of those respective findings. |
| **Aster Global Findings - Round 4** | Revisions made to Upt in Data and Parameters have voided any potential finding. This finding is closed. |

| **Item Number** | 10 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.4.2** Methodology developers shall include within the methodology an assessment of uncertainties that may result from application of the methodology. Methodology developers shall make reasonable assumptions (based on available data, literature and precision standards included in the methodology) of the uncertainty ranges of the parameters in the methodology. They must estimate the resulting emission reduction uncertainty, using standard error propagation equations or simulation techniques. The assessment shall conclude whether there is a significant risk that the uncertainty for estimating emission reductions (i.e., the half-width of the two-sided 90 percent confidence interval) could exceed 10 percent of the estimated value. The risk shall be deemed significant where uncertainties are expected to exceed 10 percent in at least 10 percent of the cases (i.e., the worst case scenario). See box below for an example emission reduction uncertainty calculation. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 9 |
| **Aster Global Round 1 Findings** | It is unclear how this new requirement has been achieved within the data and parameters tables. The assessor did not note where this uncertainty estimation and analysis occurred for each parameter. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | Uncertainty is addressed in section 8.4 in the main methodology, and in the statistical tests in the appendix. Uncertainty has been reframed to a 10% of the mean threshold with 90% confidence, to align with new VCS methodology requirements. |
| **Aster Global Findings - Round 2** | The assessment team finds that Uncertainty is determined in line with VCS methodology requirements; however, findings have been raised with regards to determination of Up for various carbon pools. This finding is pending resolution of those respective findings. |
| **Aster Global Findings - Round 4** | Revisions made to Upt in Data and Parameters have voided any potential finding. This finding is closed. |

| **Item Number** | 11 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.4.4** Where it is likely that the half-width of the two-sided 90 percent confidence interval for estimating emission reductions could exceed 10 percent of the estimated value, methodologies shall: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how this new requirement has been achieved in the methodology. |
| **Round 1 NCR/CL/OFI** | CL: Please demonstrate if/how this requirement has been achieved within the methodology. |

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| **Round 1 Response from Methodology Developer** | Uncertainty is addressed in section 8.4 in the main methodology, and in the statistical tests in the appendix. Uncertainty has been reframed to a 10% of the mean threshold with 90% confidence, to align with new VCS methodology requirements. |
| **Aster Global Findings - Round 2** | The assessment team finds that Uncertainty is determined in line with VCS methodology requirements; however, findings have been raised with regards to determination of Up for various carbon pools. This finding is pending resolution of those respective findings. |
| **Aster Global Findings - Round 4** | Revisions made to Upt in Data and Parameters have voided any potential finding. This finding is closed. |

| **Item Number** | 12 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.4.5** Where the half-width of the two-sided 90 percent confidence interval exceeds 100 percent of the emission reduction estimate, the project is not eligible for crediting. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear if this text needs to be added to the methodology. |
| **Round 1 NCR/CL/OFI** | CL: Please add this new requirement to the methodology. |
| **Round 1 Response from Methodology Developer** | Text added in section 8.4 |
| **Aster Global Findings - Round 2** | The assessor confirms the text was included at the end of Uncertainty Section 8.4. This item is addressed. |

| **Item Number** | 13 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.5.2** Where methodologies use default factors and standards to ascertain GHG emission data and any supporting data for establishing baseline scenarios and demonstrating additionality, the following applies: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | All |
| **Aster Global Round 1 Findings** | It appears the methodology uses third-party default factors and/or standards. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how all default factors applied within the methodology meet the prescribed requirement. |
| **Round 1 Response from Methodology Developer** | Default values included in the methodology are those provided in the CDM methodologies and tools. Our understanding is that requirements 2.5.2 and 3.4.6 are met by using default values provided in CDM methodologies and |

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| | tools (our "appropriate data source"), which follow the CDM guidelines for quality assurance referred to in those sections. |
| **Aster Global Findings - Round 2** | The assessment team reviewed the default values used in the methodology and determined the below requirements have been met. See following lines for more details. |

| **Item Number** | 14 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **2.5.3** Where proxies are used, it shall be demonstrated that they are strongly correlated with the value of interest and that they can serve as an equivalent or better method (e.g., in terms of reliability, consistency or practicality) to determine the value of interest than direct measurement of the value itself. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The audit team noted proxies are present within the methodology via the application of remote sensing rather than measuring trees. It is unclear how the methodology requirements prescribed are met. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the application of proxies meets all related methodology requirements. |
| **Round 1 Response from Methodology Developer** | Requirements for the stocking index are specified in the parameter table in the appendix: The remote sensing metric applied must satisfy the following:<br>a) Significant correlation with terrestrial carbon stocks, minimally with aboveground biomass, previously substantiated with published or peer-reviewed studies<br>b) Validated with direct measurements from the project region (collected from within the national boundary).<br>Processing and analysis of remote sensing data must apply established best practices, such as those found in:<br><br>Global Forest Observations Initiative. 2016. Integration of remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests: Methods and guidance from the Global Forest Observations Initiative, edition 2.0. Rome, Italy: U.N. Food and Agriculture Organization. 224 p.<br><br>Mitchell, A.L., Rosenqvist, A. & Mora, B. 2017. Current remote sensing approaches to monitoring forest degradation in support of countries measurement, reporting and verification (MRV) systems for REDD+. Carbon Balance Manage 12, 9 |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to close the identified finding. |

| **Item Number** | 15 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **2.6.2** Where a methodology combines AFOLU project categories, the methodology shall adhere to all sets of requirements pertaining to each and every project category covered, either separating activities, or where activities cannot be separated, taking a conservative approach to each requirement. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | All |
| Aster Global Round 1 Findings | Although other comments have been issued, it is unclear how this VCS requirement has been achieved, as it appears a combination of ARR and WRC project categories is allowed. The methodology does not currently contain any requirements for WRC project categories. |
| Round 1 NCR/CL/OFI | CL: It is unclear how the methodology adheres to this VCS requirement that it must further adhere to all sets of requirements pertaining to WRC. |
| Round 1 Response from Methodology Developer | The methodology is not applicable to WRC activities. |
| Aster Global Findings - Round 2 | Thank you for the clarification. The assessment team determined this is appropriate. Item closed. |

| Item Number | 16 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.1.2** Defined terms shall be used within the methodology and methodologies shall not define terms that are already included in the VCS Program Definitions. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology (Section 3) |
| Aster Global Round 1 Findings | The term "commercial species" is defined in the definition section. However, “commercial timber” is used within the methodology. It is unclear to the assessment team if the timber term should be included in the definitions section of the methodology. |
| Round 1 NCR/CL/OFI | CL: Please clarify in line with the findings. |
| Round 1 Response from Methodology Developer | Commerial species definition stricken (no longer relevant). |
| Aster Global Findings - Round 2 | A search for "commercial" in the revised document yielded no results. This item is addressed. |

| Item Number | 17 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.2.1** Methodologies shall use applicability conditions to specify the project activities to which it applies and shall establish criteria that describe the conditions under which the methodology can (and cannot, if appropriate) be applied. Any applicability conditions set out in tools or modules used by the methodology shall also apply. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 4) |
| **Aster Global Round 1 Findings** | The methodology states "The project activity takes place on organic soils or wetlands but applies a combined ARR-WRC methodology referring to this methodology for the non-soil-related procedures," but the methodology doesn't outline any WRC requirements.<br><br>Further, the second applicability criterion, as written in context with the first criterion, indicates any project using the methodology *must* be located on organic soils or wetlands. It is unclear if this is the intent of the applicability condition (to exclude projects on inorganic soils or non-wetlands). Perhaps the use of "If" at the beginning of the criterion would clarify. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify why WRC requirements are not included in the methodology.<br><br>Please ensure the applicability condition is written clearly so as not to unintentionally exclude projects on inorganic soils or upland areas. |
| **Round 1 Response from Methodology Developer** | All reference to WRC stricken from methodology. |
| **Aster Global Findings - Round 2** | The assessment team confirmed the term "WRC" is no longer included in the methodology. However, (non) applicability condition #2 is still written in a way that is unclear. It is unclear why the second sentence is included if activities cannot take place on organic or wetlands. The sentence seems to indicate that species can be planted in organic soils as long as they do not result in an intentional manipulation of the water table, but the previous sentence excludes project activities on organic soils or wetlands. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify if the second non-applicability condition, as written, should be revised for clarity. |
| **Round 2 Response from Methodology Developer** | Non-app conditon discussed w review team on Mar 15 2023. Revised to "2. Project activity takes place on organic soils or wetlands and results where such activities result in ..." (eliminating the "and" to present as a single condition and avoid any confusion. |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| Item Number | 18 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.2.4** Where a methodology uses a performance method for determining additionality, the applicability conditions shall ensure that the project implements technologies and/or measures that cause substantial performance improvement relative to the crediting baseline and what is achievable within the sector, and the methodology shall explicitly specify such technologies and/or measures (or examples thereof). Note that the implementation date of such technologies and/or measures is the project start date and the VCS Program rules with respect to project start date apply (i.e., implementation will need to have occurred within timeframes permitted under the VCS Program rules on project start date). Activities that have not implemented any such technologies and/or measures, or that have implemented them on a date that is earlier than that permitted under the VCS rules on project start date, shall be excluded from the methodology. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 4), Appendix A |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team how the applicability conditions defined in the methodology and appendix satisfy this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | This requirement is addressed by applicability condition 1: The project activity qualifies as afforestation, reforestation or revegetation. This may include direct (e.g. manual planting, broadcast seeding) and indirect activities (e.g. activities that permit or facilitate natural regeneration, like herbivory exclosures). |
| **Aster Global Findings - Round 2** | The applicability condition is singular and allows for ARR activities.<br><br>For the census based approach: There is language in the second Table 1 stating "No pre-existing woody biomass (e.g., trees or shrubs) is removed to provide space for the plantings (confirmed via pre-project photos and/or attestation)." The assessment team believes this to be ambiguous and does not have a strong temporal element. How far back is the project, and subsequently validator, to look for biomass removal? It seems critical that this should have a time component to define a specific lookback, or at least a minimum period.<br><br>For the area based approach: The area based approach does not share a similar requirement for demonstrating that no pre-project woody biomass was removed which would seem to be an important element that could be included here. Without such as requirement the only other requirement in the VCS Methodology Requirements precluding removal of pre-project biomass states that “The project area shall not be cleared of native ecosystems within the 10-year period prior to the project start date, as set out in the VCS Program document VCS Standard.” While the intention of the rule is clear, how does this prevent the clearing of a mature, non-native forest to create additionality, which could result in a net loss of CO2e? An example might be a mature melaleuca forest in the Everglades in Florida, a mature Pinus radiata forest in Chile (a species native to California), or Chinese tallow thicket in South Carolina. As all of these are non-native species in the referenced locations. It would appear the methodology would allow for them to be cleared a few years before planting a native species to create additionality of a VCS ARR project.<br><br>This question was raised by email to the methodology project team, and the response was that If the clearing is part of the project activity, the pre-existing biomass must be accounted for in the t=0 measurement. If the clearing was not part of the project activity (e.g., done by another actor for another reason), then those pre-existing stocks are not accounted in the t=0 measurement, because t=0 (marked by the initiation of the project activity, planting etc.) is after the clearing.<br><br>It is agreed that any removals of pre-existing woody biomass as part of the project activity (e.g., due to site preparation) are accounted by calculating stock change referencing initial t=0 stocks. However this would appear to |

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| | only account for standing biomass at the project start, not if cleared a few years prior or cleared a year prior to the project under separate ownership, then sold to the project developer. If so, how would such removals not result in a net loss of carbon in the first few years of the project?<br><br>Additionally, it is not clear that the project activity has a measure to ensure that the project developer, not just a previous owner, has not cleared the land of biomass prior to the date of project implementation UNLESS it is native vegetation.<br><br>Note that the current format of the applicability conditions in Table 1 seems somewhat confusing. The over-arching applicability condition(s) should direct readers to adhere to the additional, method-specific applicability conditions in Table 1. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the finding. |

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| **Round 2 Response from Methodology Developer** | In section 8.2.2 area-based approach we have added the following requirement under pre-existing woody biomass: "Where the slope of a linear regression of stocking index values (see Appendix A) from time t-10 to 0 is significant and negative, clearing of pre-existing biomass is indicated and the burden of proof is on the project proponent to demonstrate that the clearing did not take place to create GHG credits, by providing evidence indicating that:<br><br>a) prior clearing was the result of natural disturbance such as fire, hurricanes or floods (e.g. aerial imagery), or<br>b) prior clearing was conducted for a purpose not to create GHG credits (e.g. evidence showing that consideration of carbon finance, e.g. initiation of a feasibility study or first communications with a carbon project developer, post-dated the clearing event, or evidence from community surveys that there was little local knowledge or engagement on carbon projects at the time the clearing took place), or<br>c) prior clearing was conducted by actors other than the project proponent (e.g. evidence, such as community surveys or law enforcement records, showing that clearing was conducted in the process of land invasion by external actors, or that clearing took place when the project area was under ownership by an actor other than, and unrelated to, the project proponent).<br><br>If such evidence cannot be provided, it is assumed that the clearing was part of the project activity and the project start must be reset to the prior clearing event and initial t=0 stocks must be based on stocks estimated immediately prior to clearing. If no estimates of stocks prior to the clearing event are available, the project is ineligible." For the census-based approach, in Table 1 we have amended the requirement to specify the minimum look back: "No pre-existing woody biomass (e.g., trees or shrubs) has been removed *within the past 10 years* to provide space for the plantings (confirmed via pre-project photos and/or attestation)." |
| **Aster Global Findings - Round 3** | The data being gathered for the performance benchmark is being used as a tool to determine pre-project stocking index values.<br><br>For b) and c), whle this addresses some circumstances it is unclear how this will prevent gaming of the system, where saavy project developers could approach traditional forestry operations that had no previous intent of entering a carbon project. Further, the allowed minimum crediting period for ARR projects would allow traditional pine plantation operations, for example, to benefit from a carbon project, while enacting no real change in practices. |
| **Round 3: NCR/CL/OFI** | CL: Please review the concern of b) and c) and provide assurances for how the methodology will prevent gaming of the system through collusion or coordination between landowners. |

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| **Round 3 Response from Methodology Developer** | The examples invoked refer to treatment of business as usual production forestry operations. Such activities driven by non-C markets would have to demonstrate an investment barrier, as currently required by the methodology of any "project [that] will generate non-carbon revenues." If such a project were to somehow demonstrate an investment barrier, it would further be required to demonstrate additionality on application of the performance benchmark. Imagine the following scenario in a loblolly pine plantation managed on a 20-year crediting period (matching rotations under intensive private management): stand is clearcut at t-1 and planted at t=0. To derive the performance benchmark, such a stand would be matched to stands within the immediate 100 km radius, private, landscape (donor pool criteria), so likely subject to the same market forces, and with a similar trend in historic stocking index (i.e. growing stand suddenly dropped to zero at the end of the period). This would result in the performance benchmark likely following the same trend as the project, which would result in an insignificant difference in stocking index trends via Z test and return a non-additional determination. Both of these "barriers" to additionality demonstration would apply regardless of ownership (i.e. could not be circumvented by changing apparent ownership through a shell company, another scenario posited by the Aster team). |
| **Aster Global Findings - Round 4** | The methodology developers note that several means are available to prevent gaming of the system through collusion of coordination between landowners. The methodology includes an investment barrier test and a performance barrier test.<br><br>The assessment team agrees these should guard against gaming of the system through collusion of coordination between landowners. **This item is closed.** |

| **Item Number** | 19 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.2.5** The applicability conditions shall establish the scope of validity of the methodology, and where multiple benchmarks are established, each performance benchmark, including the geographic scope. In establishing the scope of validity of the methodology or each performance benchmark, the methodology shall clearly demonstrate that there is similarity across the subareas of the geographic scope in factors such as socio-economic conditions, climatic conditions, energy prices, raw material availability and electricity grid emission factors, as such factors relate to the baseline scenario and additionality, noting that variation is permitted where correction factors address such variation as set out in Section 2.3.11. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 4), Appendix A |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team how the applicability conditions defined in the methodology and appendix satisfy this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | The performance benchmark is matched to each sample unit of the project area, and does not represent broad sets of conditions. Scope of validity is established via application of the matching criteria specified in the appendix. |

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| **Aster Global Findings - Round 2** | The clarification provided is sufficient to close the identified finding. |

| **Item Number** | 20 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.2.6** The applicability of a methodology or a performance benchmark shall be limited to the geographic area for which data are available, or it shall be demonstrated that data from one geographic area are representative of another or that it is conservative to apply data from one geographic area to another. Representativeness shall be determined in terms of the similarity of the geographic areas considering such factors as those set out in Section 3.2.5 above. Likewise, it shall be determined that it is conservative to apply data from one geographic area by considering the same factors. In determining whether two areas are sufficiently similar, or that it is conservative, to allow data to apply from one area to another, only factors related to the baseline scenario and additionality need to be considered. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 4), Appendix A |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team how the applicability conditions defined in the methodology and appendix satisfy this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Similarity of controls (from which the performance benchmark is derived) is established via application of the matching criteria specified in the appendix. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to close the identified finding. |

| **Item Number** | 21 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 3) Compare the GHG sources, sinks and reservoirs identified for the project with those identified in the baseline scenario, to ensure equivalency and consistency. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 5, Table 2, Table 3) |
| **Aster Global Round 1 Findings** | The methodology as written does not compare carbon pools for the project and baseline scenario to ensure equivalency and consistency as required. Further it is unclear how the baseline established by the performance benchmark accounts for all identified pools . |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |

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| **Round 1 Response from Methodology Developer** | Equivalency between remotely-sensed control and project plots (from which the performance benchmark is calculated) is exact - they both reference the stocking index. The stocking index is derived from remote sensing with demonstrated correlation with aboveground biomass, but employs the (logical) assumption that gains in aboveground biomass are correlated with gains in all other pools (including dead wood, litter, SOC ...), as these inputs are derived from aboveground biomass. Aboveground biomass is also by far the most significant pool is these ARR systems. The assumption would be tenuous if we were interested in pre-existing stocks, but we're not, we're interested in incremental gains in stocks resulting from ARR, which should be proportional to gains in AGB. |
| **Aster Global Findings - Round 2** | It is unclear whether the equivalency values in all pools in the baseline would be consistent with measured project values, in that project values may result in higher rates of growth. For example, if slow growing are species used in the performance benchmark and fast growing species are planted in the project, would this equivalency argument still hold? Additionally, were there any scenarios that were considered by the methodology developers where equivalency was identified as a potential issue? |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 2 Response from Methodology Developer** | Additional discussion on the finding was held with the review team on March 15 2023, explaining equivalency of observations in the project and controls. Comparative rates of growth are assessed and accounted applying the Performance Benchmark. |
| **Aster Global Findings - Round 3** | The referenced discussion was sufficient to close the identified finding. Item closed. |

| **Item Number** | *22* |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.3.4** The relevant carbon pools for AFOLU project categories are aboveground tree biomass (or aboveground woody biomass, including shrubs, in ARR, ALM and ACoGS projects), aboveground non-tree biomass (aboveground non-woody biomass in ARR and ALM projects), belowground biomass, litter, dead wood, soil (including peat) and wood products. Methodologies shall include the relevant carbon pools set out in Table 1 below. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 5, Table 2, Table 3) |
| **Aster Global Round 1 Findings** | Table 2 of the ARR Methodology contains a list of all relevant carbon pools as listed in Table 2 of the VCS Methodology Requirements document. However, they are not in alignment with the required Table 2 in the methodology template, e.g., baseline and project are not differentiated. Note: the template appears to be missing Table 1, but this appears to be an oversight, so Tables 1 and 2 of the current methodology are appropriately numbered.<br><br>It is unclear why litter and SOC would be excluded in the census-based approach. |
| **Round 1 NCR/CL/OFI** | NCR: Please revise the table to include the required elements. Please clarify why litter and SOC are not included in the census-based approach. |

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| **Round 1 Response from Methodology Developer** | Table 3 matches Table 2 (covering sources) of the methodology template. No specific format is specified for pools (methodology table 2). Litter and SOC are excluded from the census-based approach because those pools cannot be directly attributed to the planting units. |
| **Aster Global Findings - Round 2** | The selection of which pools to include or not include when using the area or census basis remains unclear and is not remediated by Table 2. The paragraph in Section 2, "Pools and sources accounted in the project boundary include woody (tree and shrub) above and belowground biomass, non-woody biomass, dead wood, litter, soil organic carbon, non-CO2 emissions from biomass burning and N2O emissions from nitrogen fertilizer." appears to suggest accounting is always inclusive of all of these pools. Further, the text accompanying Eq 1 in 8.2.1 explicitly states that the census-basis excludes litter, non-woody biomass and SOC, but fails to explicitly state whether dead wood is included. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please make clear which pools are included; as the inclusion or exclusion of pools for the area and census-based approach is reiterated throughout the Methodology, please ensure consistency. |
| **Round 2 Response from Methodology Developer** | Text accompanying Eq 1 in 8.2.1 now states that the census-basis excludes litter, non-woody biomass dead wood and SOC. Table 2 is now broken down into Table 2.1 (area-based approach) and Table 2.2 (census-based approach). |
| **Aster Global Findings - Round 3** | The assessment team confirmed that text accompanying Eq 1 has been appropriately updated. Breaking Table 2. into two tables for the census and area based approach is appropriate and required pools for each approach are now correctly presented. However, the referenced statement "Pools and sources accounted in the project boundary include woody (tree and shrub) above and belowground biomass, non-woody biomass, dead wood, litter, soil organic carbon, non-CO2 emissions from biomass burning and N2O emissions from nitrogen fertilizer" is still included in section 2. It is unclear how this statement would be appropriate if a project is only utilizing the census based approach. |
| **Round 3: NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 3 Response from Methodology Developer** | Text in section 2 revised to align with tables 2.1 and 2.2, summarizing pools and sources by quantification approach |
| **Aster Global Findings - Round 4** | The assessment team finds that text in Section 2 has been changed; now text explictly states which pools and sources are accoutned for under area basis separately from the census basis. This text is also consistent with Tables 2.1, 2.2, and the (second) Table 1. This findings is closed. |

| **Item Number** | 23 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.3.7** Specific carbon pools and GHG sources do not have to be accounted for if their exclusion leads to conservative estimates of the total GHG emission reductions or removals generated. The methodology shall establish criteria and procedures by which a project proponent may determine a carbon pool or GHG source to be conservatively excluded. Such conservative exclusion may be determined by using tools from an approved GHG program, such as the CDM A/R methodological tool Procedure to determine when accounting of the soil organic carbon pool may be conservatively neglected in CDM A/R project activities, or by using peer-reviewed literature. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 5, Table 3) |
| **Aster Global Round 1 Findings** | It is unclear whether SOC being excluded in the census-based approach is considered conservative, especially if activities include tilling, etc. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessment team findings. |
| **Round 1 Response from Methodology Developer** | We conducted an extensive review of the impact of single tillage applications (analogous to site prep or planting). This is documented in "SOC recovery tillage.xlsx" and referenced publications provided with our response. Any SOC loss from tillage tends to be recovered within 2 years of disturbance across a wide range of regions, soil types and (single) tillage practices. The notable exception involves moldboard plowing, and we have added the following requirement in selection of the accounting boundary (Table 2): SOC must be included where soil disturbance from the project activity (i.e. from site preparation);<br>• occurs more than once during the project crediting period (i.e. at site preparation) and<br>• involves soil inversion to a depth exceeding 25 cm (e.g. that would result from a moldboard plow). |
| **Aster Global Findings - Round 2** | SOC exclusion from the census-based approach was discussed in the meetings and appears to be appropriate.<br><br>There is a typo under Soil organic carbon (a redundant use of "MustSOC"). |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please correct the typo under SOC in Table 2. |
| **Round 2 Response from Methodology Developer** | Typo corrected. |
| **Aster Global Findings - Round 3** | The referenced typo is been corrected. Item closed. |

| **Item Number** | 24 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.3.10** Where a methodology is applicable to projects that may reduce the aboveground non-woody biomass, belowground biomass, litter, dead wood or soil pools above de minimis (as set out in Section 3.3.6), the relevant carbon pool shall be included in the project boundary. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology (Section 5, Table 2, Table 3) |

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| **Aster Global Round 1 Findings** | Table 2 of the ARR Methodology contains a list of all relevant carbon pools as listed in Table 2 of the VCS Methodology Requirements document. Above-ground herbaceous (or non-woody) biomass is listed as "yes" in the "Included?" column, while "Optional" in the "Justification/Explanation" column. These should be consistent.<br><br>The terms "herbaceous" (see end of Section 2 and equations, for example) and non-woody are used interchangeably and should be consistent.<br><br>The text in this section is different sizes and should be 10.5, as the template requires. |
| **Round 1 NCR/CL/OFI** | CL: Please see the Findings, clarify the pool, and correct text size. |
| **Round 1 Response from Methodology Developer** | "herbaceous" changed to "non-woody" for consistency. Formatting will be addressed in final version of methodology. Optional now consistently specified for this pool. |
| **Aster Global Findings - Round 2** | The term "herbaceous" has been removed from the methodology, and "non-woody" is used throughout. Since "non-woody" is not included in the VCS Program Definitions, it needs to be included in the Methodology Definitions Section 3.<br><br>Further, the term "significantly" should be defined for the inclusion on non-woody in the project, so as not to be ambiguous. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please include non-woody in Methodology definitions, and ensure *all* other relevant terms are defined if they are not already included in the VCS Program Definitions.<br><br>Please define or put parameters on the usage of "significantly" for this pool. |
| **Round 2 Response from Methodology Developer** | Definition now provided for woody biomass: "Biomass in plants with hard, lignified, stems, including e.g. trees, shrubs, palms and bamboo." Non-woody is implicitly anything that does not qualify as woody. |
| **Aster Global Findings - Round 3** | The term "woody" has been included in the definitions section. However, the use of "significantly" in Table 2.1 has not been defined or specified. The assessor believes this is ambiguous, and parameters should be set to ensure consistent application. |
| **Round 3: NCR/CL/OFI** | CL: Please include a parameter or definition for "significantly" to ensure consistent application across all project types. |
| **Round 3 Response from Methodology Developer** | Tables 2.1 and 2.2 revised to specify that significantly means (i.e. is not determined to be de minimis) - note this text that immediately precedes the tables: "Carbon pools may be deemed de minimis and do not need to be accounted for if together the omitted decrease in carbon stocks or increase in GHG emissions amounts to less than 5% of the total GHG benefit generated by the project, applying procedures in Appendix B." |
| **Aster Global Findings - Round 4** | The assessment team notes than significance has been defined (by means of referring to Appendix B) in Section 4 Applicability, Section 5 Project boundary, and Section 8.2.9 Guidance on ex-ante estimation of project net GHG removals. The assessment team finds no instances where the term significance is applied to determination of inclusion/exclusion of pools & sources AND reference to Appndix B is not made. Therefore, **this item is closed.** |

| Item Number | 25 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.4.1** Methodologies using a project method shall establish criteria and procedures for identifying alternative baseline scenarios and determining the most plausible scenario, taking into account the following: |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Section 6, VCS ARR Methodology 12Aug2022 rev.docx |
| Aster Global Round 1 Findings | The assessment team was unable to locate criteria and procedures within Section 6 of the document to identify alternative baseline scenarios and determining the most plausible scenario in the absence of the project application. Noting that the project activity is a planting activity, the approach currently defined does not account for currently existing or the likely future status of the ground in the absence of the planting activities, as required. |
| Round 1 NCR/CL/OFI | NCR: Please provide detail in the methodology addressing the finding and including relevant requirements. |
| Round 1 Response from Methodology Developer | the "ground" is not the project boundary. The boundary is the tree itself. Consequently, the alternate scenario is a tree established in the absence of C finance (which is excluded through the additionality barrier test) |
| Aster Global Findings - Round 2 | The assessment team is concerened the inclusion of bamboo as a tree could create quantification issues. Bamboo (and potentially other species) are not easily contained within a small area and could spread onto a neighboring non-project or project site.<br><br>Further, accounting boundary needs to be spatially explicit based on Equation 22 (fertilization). |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please address assessor findings. |
| Round 2 Response from Methodology Developer | Biomass estimation of bamboo is not a quantification issue - e.g. measurement protocols and published allometric equations exist. VCS Standard 3.1.8 safeguards require mitigation of any negative impacts on the natural environment - if e.g. a project was planting a rhizome spreading (not clumping) bamboo species, any potential for spread and invasion of bordering natural communities would have to be considered and addressed. Also, re spatial boundary for fertilizer application, this component has been eliminated with revision of accounting approach to solely mass-based (see response to finding 42). |
| Aster Global Findings - Round 3 | First, the change in calculation procedures regarding emissions from fertilization have partially satisfied this finding. The assessor note that the current methodology version calculates emissions from mass of fertilization applied rather than mass per unit area. Second, the current methodology version's applicability conditions when using the census-basis disallows the use of including planting units which are expected to expand beyond 10 meters radius from their originally established location. Further, the assessment team notes the Standard S3.18.17 states: "The project shall not introduce any invasive species or allow an invasive species to thrive through project implementation. " Consequently, the assessment team finds the Methodology Developer response as sufficient to close this finding. |

| Item Number | 26 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.4.4** Methodologies shall identify alternative baseline scenarios and determine either the most plausible baseline scenario or an aggregate baseline scenario for the project activity. Aggregate baseline scenarios shall be determined by combining likely scenarios on a probabilistic (i.e., likelihood) basis.<br>Note – The most plausible baseline scenario or aggregate baseline scenario for many AFOLU project activities is represented by the control data (i.e., for methodologies using a dynamic performance benchmark) or reference region. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A: Performance Method |
| Aster Global Round 1 Findings | The alternative baseline scenario is identified as "business as usual carbon stocks" as represented by the control data. It is unclear to the assessment team how this is appropriate and if other alternative baseline scenarios were considered. If they were considered, it is unclear why they are not included in the Performance Benchmark. |
| Round 1 NCR/CL/OFI | CL: Please clarify in line with assessor findings. |
| Round 1 Response from Methodology Developer | the business as usual represented in the control plots (constituting the dynamic performance benchmark) represents the entire range of observed alternate baseline scenarios (continued non-forest, reforestation w non C incentives, natural regen, etc.). |
| Aster Global Findings - Round 2 | The assessor agrees that the dynamic performance benchmark will capture pre-existing baseline conditions. This item is addressed. |

| Item Number | 27 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.4.5** Performance benchmarks shall be established based upon available technologies and/or current practices, and trends, within a class of activities. Where the analysis of current distribution of performance within a class of activities for a methodology-established performance method shows a clear trend of improvement in the baseline scenario over time, the performance benchmark shall take account of the trend through the use of an autonomous improvement factor, as set out in Section 3.4.8. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A: Performance Method |
| Aster Global Round 1 Findings | It is unclear how the performance benchmark as currently defined meets this requirement. |
| Round 1 NCR/CL/OFI | CL: Please clarify in line with assessor findings. |
| Round 1 Response from Methodology Developer | because the performance benchmark is dynamic, any trends are continuously included. |

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| **Aster Global Findings - Round 2** | Pending response to finding 34. |
| **Aster Global Findings - Round 4** | The dynamic performance benchmark nature of this methodology appears to inherently capture trends in the baseline. It is intended to account for these improvements. As other items related to this have been addressed, the assessor affirms this item is now also addressed. |

| **Item Number** | 28 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 4) Where sampling is applied in data collection, the requirements set out in Section 2.1.3 shall be adhered to. The methodology developer shall demonstrate that sampling results provide an unbiased and reliable estimate of the true mean value (i.e., the sampling does not systematically underestimate or overestimate the true mean value). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear how the Appendix as written demonstrates that sampling results provide an unbiased and reliable estimate of the true mean value. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | the appendix requires random, systematic or PPS sampling of project/treatment plots, ensuring that this sample is representative. Control plot selection is inherently and deliberately biased (like all matching approaches) to align most closely with the attributes of the project/treatment plots. The performance benchmark is not a representative sample of the landscape surrounding the project area, but instead a targeted match. |
| **Aster Global Findings - Round 2** | The assessment team notes that control plots are selected and subsequently tested by calculating a z score (Eq A2) to ensure the control plots are representative of the project area. This finding is closed. |

| **Item Number** | 29 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 5) Data shall be publicly available or made publicly available. Proprietary data (e.g., data pertaining to individual facilities) may be aggregated, and therefore not made publicly available, where there are demonstrable confidentiality considerations. However, sufficient data shall be publicly available to provide transparency and credibility to the dataset. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear how the performance benchmark as currently defined meets this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | data and results applying the appendix procedure will be validated and published in the PD and MIRs on the VCS Registry. |

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| **Aster Global Findings - Round 2** | This finding is pending the below finding related to documentation of performance benchmark data in the monitoring plan. |
| **Aster Global Findings - Round 3** | As the requirement here is for data to be [made] publicly available, and that will inherently happen with the publishing of the PD and MR, this item is addressed. |

| **Item Number** | 30 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 6) All data shall be made available, under appropriate confidentiality agreements as necessary, to Verra and each of the validation/verification bodies assessing the proposed performance benchmark methodology, to allow them to reproduce the determination of the performance benchmark. Data shall be presented in a manner that enables them to independently assess the presented data. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear how the performance benchmark as currently defined meets this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | data and results applying the appendix procedure will be validated and published in the PD and MIRs on the VCS Registry. |
| **Aster Global Findings - Round 2** | The assessment team identified broad language in Section 9.3 regarding the description of data required to be included in the Monitoring Plan related to derivation of the Performance Benchmark. However, the assessment team is unsure as to what level of detail 'data' represent (e.g., are they values and coordinates of all control plots?). The assessment team notes for comparison that a similar methodology, VM0045, gives precise language as to what data are required to be included in the monitoring plan in order to derive the performance benchmark. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify how data used in the derivation of the performance benchmark will be described by Methodology users in their monitoring plan and what specifications will be required. |

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| **Round 2 Response from Methodology Developer** | Section 9.3 expanded to include specifics around data to be documented and reposited regarding monitoring remotely-sensed project and control plots - "For projects using the area-based quantification approach, a database must be maintained where datasets related to remotely-sensed plots are reposited. The database must include, minimally:<br>1. A list of remotely-sensed project plots including unique IDs, locations, size and configuration and time series of stocking index values from time t=0 to time t.<br>2. A list of remotely-sensed control plots including unique IDs (referencing unique ID of corresponding remotely-sensed project plot to which they were matched; note duplicate entries are expected where a remotely-sensed control plot is matched to more than one remotely-sensed project plot), locations, size and configuration, weights and time series of stocking index values from time t=0 to time t.<br>3. Remote sensing datasets and time stamps used to derive stocking index values<br><br>The monitoring plan must also specify the schedule and procedures for periodically acquiring, archiving, and processing remote sensing data to derive stocking indices." |
| **Aster Global Findings - Round 3** | The assessment team confirms revisions have been made which detail, in greater precision, the data that users are required to document with regards to determination of the performance benchmark.<br><br>**This item is closed.** |

| **Item Number** | 31 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 8) All reasonable efforts shall be undertaken to collect sufficient data and the use of expert judgment as a substitute for data shall only be permitted where it can be demonstrated that there is a paucity of data. Expert judgment may be applied in interpreting data. Where expert judgment is used, good practice methods for eliciting expert judgment shall be used (e.g., IPCC 2006 Guidelines for National GHG Inventories). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear how the performance benchmark as currently defined meets this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | no expert judgment is invoked in the appendix, nor allowed. |
| **Aster Global Findings - Round 2** | The assessment team verified that no room is made for expert judgement with regards to any quantities. This item is addressed. |

| **Item Number** | 32 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 9) Where data must be maintained in a central repository on an on-going basis (e.g., in a database that holds sector data for use by project proponents in establishing specific performance benchmarks for their projects), there shall be clear and robust custody arrangements for the data and defined roles and responsibilities with respect to the central repository. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear where in Appendix A information to satisfy this requirement is described. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | implicit in section 9.3, now made explicit with clarification under 9.3 #5. |
| **Aster Global Findings - Round 2** | Whether data are to be reposited or documented is not made clear in Section 9.3. As written, it leaves open the interpretation that data to be collected need only be documented. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify how data will be recorded and what specifications will be required. |
| **Round 2 Response from Methodology Developer** | Section 9.3 expanded to include specifics around data to be documented and reposited regarding monitoring remotely-sensed project and control plots. See response to finding 30 above. |
| **Aster Global Findings - Round 3** | The revisions to Section 9.3 do not appear to address chain of custody requirements from sub-section g). Requirements for maintenance of the datbase should be included. |
| **Round 3: NCR/CL/OFI** | CL: Please ensure the requirements in Section 9.3 cover this methodology requirement regarding chain of custody of data. |
| **Round 3 Response from Methodology Developer** | Added to 9.3 - "Roles and responsibilities defined for chain of custody, repositing and maintenance of all data." |
| **Aster Global Findings - Round 4** | The assessment team notes that 9.3 Description of the Monitoring Plan now requires "Roles and responsibilities defined for chain of custody, repositing and maintenance of all data.". **This finding is closed.** |

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| **Item Number** | 33 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.4.7** The dataset may be documented and contained within the methodology, or may be maintained in a separate repository that is referenced by the methodology. Datasets documented and contained within methodologies are static datasets, where all projects use the level of the performance benchmark metric specified in the methodology (noting that autonomous improvement factors may be used, as set out in Section 3.4.8 below). The following applies with respect to datasets maintained in a separate repository:<br><br>1) The dataset may or may not be periodically updated.<br><br>2) The methodology shall establish criteria and procedures for use of the dataset and for establishing specific performance benchmarks for individual projects.<br><br>3) The methodology may specify that projects use the level of the performance benchmark metric available at project validation for the duration of their project crediting periods, or may specify that projects use an updated level of the performance benchmark metric at each verification event. The frequency that data is updated within the dataset shall be determined by the methodology developer.<br><br>4) It shall be demonstrated that procedures are in place to maintain the dataset in accordance with the applicable requirements set out for data and datasets in Section 3.4.6 above. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | Based on assessment team review, it appears that a static dataset is not used as it is not presented within the Appendix. It is unclear how the Appendix as written meets the four sub-requirements for datasets maintained in separate repository. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Projects must update the performance benchmark metric at each verification event. Methodology Appendix A provides procedures for use of data and derivation of performance benchmark. Project proponents (in a "separate repository", i.e. project archive/database) must maintain datasets for the performance benchmark per requirement to maintain project data for 2 years after the end of the crediting period. Section 3.25.1 in VCS Standard 4.4. Changes incorporate in Appendix A under SI parameter table, specifying the frequency of updating data and remote sensing data resolution. |
| **Aster Global Findings - Round 2** | This finding is pending related findings above regarding the recording or repositing of data. |
| **Aster Global Findings - Round 4** | Following closure of above items related to Section 3.4.6, this finding is closed. |

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| **Item Number** | 34 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.4.8** Where the analysis of trends in performance of a class of activities shows a clear trend of improvement in the baseline scenario over time, the performance benchmark shall take account of the trend. This means that where the performance benchmark does not use a dataset that is updated at least annually, an autonomous improvement factor shall be used that provides a performance benchmark that tightens annually (i.e., the methodology shall establish an autonomous improvement factor performance benchmark). Notwithstanding this requirement, methodologies may allow projects to use the level of the static performance benchmark metric available at project validation for the duration of their project crediting periods (see also Section 3.4.7 below). Where the analysis of trends shows a trend of increasing GHG emissions or decreasing GHG removals in the baseline scenario over time, the performance benchmark shall not consider such trend. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear where in Appendix A information to satisfy this requirement is described. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Because the performance benchmark is dynamic, any trends are continuously included. We have clarified in the methodology and appendix that the performance benchmark is dynamic. |
| **Aster Global Findings - Round 2** | It is unclear to the assessment team how the performance benchmark is continuously included when SI is measured on a periodic basis and not tightened annually. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 2 Response from Methodology Developer** | Appendix updated to require minimally annual monitoring of SI in remotely-sensed control and project plots. |
| **Aster Global Findings - Round 3** | Revisions made to Appendix B address this finding. |

| **Item Number** | 35 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.4.10** The determination and establishment of a baseline scenario shall follow an internationally accepted GHG inventory protocol, such as the IPCC 2006 Guidelines for National GHG Inventories. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | It is unclear how the baseline established by the performance benchmark follows internationally accepted GHG Inventory protocol. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |

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| **Round 1 Response from Methodology Developer** | The performance benchmark is applied to stocks measured in the project case following IPCC GHG inventory guidance. The stocking indices and performance benchmark itself are measured only in relation to direct measured with-project value. While the approach does not produce an explicit, independent estimate of baseline stocks, it is implied in the NGR equation as delta Cwp * PB. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to address this finding. Item closed. |

| Item Number | 36 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **Wetland Restoration and Conservation (WRC)** |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The presented methodology implies the use of WRC as allowable. However, no WRC requirements are presented within the methodology as required in the methodology requirements. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify if methodology activities are allowed on WRC lands. If so, please include all relevant methodology requirements in the written methodology. |
| **Round 1 Response from Methodology Developer** | The methodology is not applicable to WRC activities. Removed language that suggest WRC would be used in conjunction with the methodology. |
| **Aster Global Findings - Round 2** | WRC activities and language have been removed from the Methodology. This item is addressed. |

| Item Number | 37 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.5.4 Step 2: Implementation Barriers** The project shall face one or more distinct barrier(s) compared with barriers faced by alternatives to the project: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 7 Additionality |

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| **Aster Global Round 1 Findings** | Preliminary Finding: The barrier analysis does not appear to be rigorous enough. There is no mention of how these barriers make the project additional, so it is unclear if this is implied or needs to be explicitly stated.<br><br>This item is also subject to further review from the standardized methods expert.<br><br>Additional Finding: Section 7 details the Additionality requirements for projects. It is unclear what is meant by "The barriers should not be specific to the project or the project proponent(s)." In the past with CDM projects, when the barrier was specific to the project, the project would be considered additional. If the barriers are not specific to the project, it is unclear how the barrier analysis be relevant to show the project as additional.<br><br>Further, many of the examples given in the implementation barriers section, if taken at face value by a future project, could give them license to state they achieve the "letter" of the methodology requirement without actually potentially being additional. Refer to comments below for specific items of concern. These Findings notes should not be taken as complete but only examples of where/why there is a concern.<br><br>For Step 2b:2), the example of "Relevant legislation, regulatory information or environmental/natural resource management norms, acts or rules;"...the use of the term "norms" here seems problematic, as a project may be against the "norm," but there is nothing to prove a barrier existed. Further, as the project already has to prove regulatory surplus, it is unclear of the implication or how the implementation of providing this evidence would work to achieve the desired proof of a barrier (in a validation scenario).<br><br>Another example in Step 2b:2), "Relevant statistical data from national or international statistics" seems vague, as what would be the criteria for "relevant," and what would be the level of confidence, allowed variance, etc.? What factors could be "controlled" for, and what if statistics between jurisdictions contained conflicting data?<br><br>Also for Step 2b:2), the example of the allowance of "Written documentation from the company or institution developing or implementing the ARR project activity or the project proponent, such as minutes from board meetings, correspondence..." should not be included, as there would be an inherent conflict of interest. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding, and ensure your response has considered the underlying concern of the Findings on sub-barriers. |
| **Round 1 Response from Methodology Developer** | The barrier analysis is now constrained to a financial barrier only. |

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| **Aster Global Findings - Round 2** | The phrase "The barrier should not be specific to the project or the project proponent(s)" is still included in the investment barrier analysis. This should be re-written to be more clear as to the intent of the statement and be unambiguous. This should also use the term "must" instead of should in line with VCS Validation and Verification Manual requirements (note a search/replace for the word "shall" should occur to ensure it is not being used, as it is reserved for VCS program documents and is generally not appropriate for methodologies).<br><br>For the implementation barriers, the assessment team is concerned about the lack of definition in the overall methodology around the practice of clearing non-native but naturalized species prior to project start date. We note the methodology states "Any pre-existing woody biomass is also measured and included in the above and below ground biomass estimate." However, we are unsure if/how "pre-existing" covers the entire 10-year period prior to the project. There are cases where naturalized, non-native species may exist and be clear-cut to then plant or let naturally regenerate to achieve later project activities. The assessment team is concerned this will not result in real additionality.<br><br>The previous language from Step 2b:2 has been removed, thus addressing the previous concerns of that sub-item. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the findings. |
| **Round 2 Response from Methodology Developer** | Text removed: "The barrier should not be specific to the project or the project proponent(s)" Re pre-existing woody biomass, see response to finding #18. |
| **Aster Global Findings - Round 3** | The stated phrase has been removed. The intent of the investment barrier analysis is more clear, and the over-arching usage of "should" has been changed to "must." However, there is still a "should" in 1)a.ii of the same section. Further, a search of the term "should" shows it in three other section [unrelated to the investment barrier section. These should also be changed to "must" in line with VCS requirements.<br><br>The implementation barrier section has been removed. However, reference to it still exists in Section 2 under "The census-based approach." |
| **Round 3: NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 3 Response from Methodology Developer** | In Section 2 under census-based approach, implementation barrier clarified to "investment barrier." All "should" changed to "must" |
| **Aster Global Findings - Round 4** | "Should" was changed to "must" in the referenced section. A search of "should" throughout the methodology indicates all other references have been changed to "must" in line with VCS requirements.<br><br>Please note the use of "on" instead of "of" in the newly added sentence of the investment barrier section. |
| **Round 4: NCR/CL/OFI** | OFI: Change "on" to "of" to be grammatcially correct. |
| **Round 4 Response from Methodology Developer** | "on" changed to "of" in two instances in the additionality section |

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| **Aster Global Findings - Round 5** | The assessment team confirms this change has been made. This finding is closed. |

| **Item Number** | 224 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 1) Investment barrier: Project faces capital or investment return constraints that can be overcome by the additional revenues associated with the sale of GHG credits. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 7, Step 2b1)a.ii |
| **Aster Global Round 1 Findings** | Regarding the grant item, it is unclear how a grant (or non-commercial funding) would prove differentiated barriers, i.e., if funding or a grant came in for one project area, that does not mean another similar area for which funding was not received had an inherent barrier for completing the project. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | The barrier analysis is now constrained to a financial barrier only. |
| **Aster Global Findings - Round 2** | Mention of the grant has been removed. This item is addressed. |

| **Item Number** | 225 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 2) Technological barriers: Project faces technology-related barriers to its implementation. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 7, Step 2b1)c |
| **Aster Global Round 1 Findings** | It is unclear how lack of access to planting material would be classified as "technological," as it may be considered an "other" type of financial barrier under Institutional barriers. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | The barrier analysis is now constrained to a financial barrier only. |
| **Aster Global Findings - Round 2** | This barrier has been removed. This item is now addressed, as technological barriers are now N/A. |

| **Item Number** | 226 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 3) Institutional barriers: Project faces financial (other than identified in investment barrier above), organizational, cultural or social barriers that the VCU revenue stream can help overcome. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 7, Step 2b1) |
| **Aster Global Round 1 Findings** | As the Methodology Requirements have 3 distinct implementation sub-barriers, the Methodology should follow suit. There are currently 7 sub-barriers, for which at least 4 could be further grouped under the over-arching Institutional barriers category.<br><br>Regarding "risk related to changes in government policies or laws," it is the assessor's opinion that there is always a risk of changes in government policies or laws, and that in and of itself should not constitute the wholistic barrier.<br><br>Note the letter "g." does not have a sub-barrier listed. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | The barrier analysis is now constrained to a financial barrier only. |
| **Aster Global Findings - Round 2** | This barrier has been removed. This item is now addressed, as institutional barriers are now N/A. |

| **Item Number** | 38 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.5.5 Step 3: Common Practice**<br>The project shall not be common practice, determined as follows: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | All |
| **Aster Global Round 1 Findings** | The assessment team was unable to locate information regarding determination of common practice in the methodology. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the methodology as written meets the requirements of Section 3.5.3. |
| **Round 1 Response from Methodology Developer** | We have now added a common practice test for projects using the census-based quantification approach. Note that projects using the performance benchmark, including projects with commercial species requiring the additional financial barrier demonstration (which goes above and beyond the VCS methodology requirements) do not require common practice demonstration. |
| **Aster Global Findings - Round 2** | A common practice demonstration has been added for the project method. This item is now pending below question. |

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| **Aster Global Findings - Round 4** | See below comments. These items are addressed. |

| **Item Number** | 38.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 3) Demonstration that the project is not common practice shall be based on guidance provided in The GHG Protocol for Project Accounting, Chapter 7 (WRI-WBCSD). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | All |
| **Aster Global Findings - Round 2** | The newly added common practice analysis contains a percent adoption of 20% as a threshold for determining common practice. The footnote indicates CDM am-Tool24 was used to determine this threshold. However, it is unclear how the 20% cost difference referenced in the "Different technologies" section of the CDM tool equates to a benchmark of percent adoption for financial barriers. Further, the VCS Methodology Requirements here require the "The GHG Protocol for Project Accounting, Chapter 7 (WRI-WBCSD)" guidance document be used. Appendix C of this document (specifically tables C.3, C.4, and C.5) contain possible thresholds for this analysis. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the finding, provide justification for the 20% threshold, and ensure the WRI-WBCSD document is being used and referenced. |
| **Round 2 Response from Methodology Developer** | The WRI protocol does not provide specific common practice adoption thresholds, and makes clear that they are context dependent. We have revised the threshold to 15%, with justification referenced to the Mathur et al 2007 paper (provided with our response, see p. 233) reporting the 10-20% "take off" point for technology adoption (inflection of the adoption curve), with the application of diffusion of innovation theory. We also now specify that the common practice assessment looks at *cumulative* adoption as of the survey date (the context in which Mathur et al is relevant). |

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| **Aster Global Findings - Round 3** | The assessor believes the threshold of 15% is largely conservative based on the literature, considerably more so than the previous 20% benchmark. However note that the referenced paper states that "similar innovations could show very different inflection points, as they are implemented across countries with different consumer, market, and policy characteristics." The methodology only states that "geographic domain **may** be further constrained to reflect similar market conditions as those presented in the project area (e.g. proximity to nurseries or wood processing infrastructure)." If this were required (i.e. "**shall**" and not "may"), it would sufficiently address the referenced paper's concerns for consumer, market and policy conditions"<br><br>1. Should this requirement state "shall" and not "may" for market conditions?<br><br>Addtionally, item 4 states "Within 5 years of the project start date, survey a representative sample of the adopter class from within the relevant geographic domain."<br><br>2. This presents problems for projects completing validation/verification within 5 years from the start date. Does a project have to wait until this analysis is complete before they can be validated?<br><br>3. Why does it state within 5 years - does a time period have to elapse before this survey of adopter class can be conducted?<br><br>4. If it is not required for the requirement to be met before (i.e., as a condition of) validation (the requirement states "within 5 years of project start..."), is it possible that a project could conduct this assessment after validation, and if its shows that adoption exceeds 15%, could a project then be invalidated? |
| **Round 3: NCR/CL/OFI** | CL: Please address items 1-3 in the finding. |
| **Round 3 Response from Methodology Developer** | "may" changed to "shall" under common practice. The 5 year time period ensures that data are relevant to the project start date. For added clarity, "+/- " added to text. There is no waiting period imposed - if a project is validated at year 5, e.g., it may use data spanning t-5 to t+5 for this demonstration. Also added text: "Additionality must be demonstrated at project validation." |
| **Aster Global Findings - Round 4** | Geographic domain criterion is now required via the usage of "shall."<br><br>The assessor understands the 5-year allowance to ensure the data is relevant to the start date. The addition of the clarifying sentence "Additionality must be demonstrated at project validation" at the beginning of the section ensures there is no waiting period or overlap for validation purposes. This item is addressed. |

| **Item Number** | 39 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.5.6** Step 1: Regulatory Surplus<br>The project activity shall meet with the requirements on regulatory surplus set out under the project method in Section 3.5.3. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology: 7 Additionality. |
| **Aster Global Round 1 Findings** | The methodology references the VCS Methodology Requirements for determining regulatory surplus, as allowable.<br><br>However, the methodology states "If the project is using the area-based quantification approach, additionality is demonstrated via application of the performance benchmark (Step 2a). If it is expected that the project will generate non-carbon revenues, evidenced from implementation plans, a project method (Step 2b) will also be applied. "<br><br>It is unclear to the assessment team why step 2b would be applied if a project is expected to generate non-carbon revenues, and how it would appropriately demonstrate additionality. Further, it is unclear how and when the application of Step 2b should be applied. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Step 2b is applied as stated: If it is expected that the project will generate non-carbon revenues. And as stated, is applied in addition to the performance benchmark as an added safeguard (to exclude projects where non-C revenues drive tree planting). |
| **Aster Global Findings - Round 3** | The methodology does not discuss whether the investment barrier analysis would stop the project or show additionality, as stated. An investment analysis can be included with a benchmark method, but the methodology does not clearly state the reasons for when this would happen. |
| **Round 3: NCR/CL/OFI** | CL: Please provide more detail for when the performance method would trigger Step 2b, and the intended outcome. |
| **Round 3 Response from Methodology Developer** | Section 7 has been clarified, providing decision points following steps, and make explicit that projects generating non-C revenues require 2 steps (performance benchmark and investment barrier). |
| **Aster Global Findings - Round 4** | The revised Methodology has clarified the use of 7 Additionality, including procedures used to determine regulatory surplus investment barriers, and the performance benchmark.<br>This finding is closed. |

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| **Item Number** | 40 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.5.7** Step 2: Performance Benchmark<br>The GHG emissions generated (or carbon sequestered) per unit of output, unit of input or sequestration metric by the project shall be below (or above, for sequestration) the prescribed performance benchmark metric or proxy for such metric (see Section 2.3.6 for specification of the metric). Proxy metrics or conditions may be specified where it can be demonstrated that they are strongly correlated with the performance benchmark metric and that they can serve as an equivalent or better method (e.g., in terms of reliability, consistency or practicality) to determine whether performance is achieved to a level at least equivalent to that of the performance benchmark metric. GHG emissions generated (or carbon sequestered) may be above (or below, for sequestration) the prescribed performance benchmark metric or proxy for such metric for a given verification period, though the project shall not be granted credit for such verification periods. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology: 7 Additionality. |
| **Aster Global Round 1 Findings** | Step 2a of Section 7 Additionality states "Requirements for deriving the performance benchmark are detailed in Appendix A, and application of the performance benchmark is treated in Section 8.5, Equation 37."<br><br>However, the assessment team was unable to find information in the referenced sections to satisfy the necessary criteria of this requirement.<br><br>Additionally, the assessment team noted that there is no Equation 37 in the methodology as written. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the methodology/appendix as currently written satisfies this requirement.<br><br>CL: Please clarify the discrepancy in the equation referenced.<br><br>CL: Please provide the research details with citations that inform Appendix A. |
| **Round 1 Response from Methodology Developer** | Derivation of the performance benchmark (PB) is fully explained in the appendix. Application of the PB is shown in section 8.5 as stated. Equation reference corrected to eq #33. |
| **Aster Global Findings - Round 4** | The assessment team determined that derivation of the performance benchmark (PB) explained in the "APPENDIX A: PERFORMANCE METHOD" satisfies the requirement. However, the assessment team noted that the appendix still contains a reference to equation 37. |
| **Round 4: NCR/CL/OFI** | CL: Please address the discrepancy in the equation referenced. |
| **Round 4 Response from Methodology Developer** | equation reference in Appendix corrected to eq. 24 |
| **Aster Global Findings - Round 5** | The assessment team has confirmed this correction has been made. This finding is closed. |

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| **Item Number** | 41 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **Concept**<br>Baseline emissions, and project emissions and/or removals, must be accurately quantified in order to determine net emission reductions and removals achieved by projects. Methodologies shall therefore set out procedures to quantify these emissions and/or removals. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 8.2.10 ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the section on ex ante estimation and noted that carbon stocks from pools other than trees may be estimated as zero. It is unclear where this has been defined as appropriate, as it conflicts with Project Description template that requires that all removals in the table are accounted for.<br><br>Further, it was noted that "For the ex-ante estimation of tree biomass, tree growth and stand development models, or published data relevant for the project area or planting units (e.g., chrono sequences) may be used. Also for herbaceous biomass, growth models and published data may be used." It is unclear to the assessment team how this language is appropriate, as alternative avenues are not provided, but the use of the word "may" is applied.<br><br>Section 8.2.10 also states "Models and published data must be from systems that are in the same or similar region as the project area, share similar geomorphic, hydrologic, and biological properties, and are under similar management regimes." It is unclear to the assessment team what the referenced "systems" refers to. |
| **Round 1 NCR/CL/OFI** | CL: Please provide guidance from Verra stating that the language as applied is appropriate. Otherwise, please correct the language.<br><br>CL: Please clarify alternative sources of ex-ante estimation or adjust the language.<br><br>CL: Please clarify what is meant by the term "systems" in the referenced paragraph. |
| **Round 1 Response from Methodology Developer** | An estimate of zero (0) for pools in the project scenario is conservative because those pools are expected to store more carbon as a result of the project activity. The phrase "may" has been replaced with must. The term "system" has been replaced with ecoregion. |
| **Aster Global Findings - Round 2** | It is unclear why ex ante calculations do not include possible emissions from excluded pools. For example, it may be conservative to exclude such pools in many forests in the US, but what about unusual management practices in places overseas that could impact other non-woody biomass pools. Given this methodology is global, was there an analysis of a broad range of management practice possibilities that could result in exclusion of carbon stocks of pools other than trees.<br><br>The use of must and ecoregion address the latter findings. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the first part of the finding. |

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| **Round 2 Response from Methodology Developer** | We have added to the ex ante guidance, specifying "carbon stocks of pools other than trees may be conservatively estimated as zero, unless they are potentially significant sources (e.g. where significant soil disturbance is part of site preparation). " |
| **Aster Global Findings - Round 3** | It is unclear what the threshold for "significant" is and how it would be applied universally across all projects. |
| **Round 3: NCR/CL/OFI** | CL: Please include a threshold for "significant" that can be consistently applied and validated/verified in the methodology. |
| **Round 3 Response from Methodology Developer** | Text in 8.2.9 clarified, adding "significant (i.e. is not determined to be de minimis, applying Appendix B)" |
| **Aster Global Findings - Round 4** | The assessment team notes than significance has been defined (by means of referring to Appendix B) in Section 4 Applicability, Section 5 Project boundary, and Section 8.2.9 Guidance on ex-ante estimation of project net GHG removals. The assessment team finds no instances where the term significance is applied to determination of inclusion/exclusion of pools & sources AND reference to Appndix B is not made. Therefore, **this item is closed.** |

| **Item Number** | 42 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.6.1** Methodologies shall establish criteria and procedures for quantifying GHG emissions and/or removals, and/or carbon stocks, for all selected GHG sources, sinks and/or reservoirs identified in the project boundary. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 6 and Section 8.1, VCS ARR Methodology 12Aug2022 rev.docx |
| **Aster Global Round 1 Findings** | The assessment team notes that the approach currently applies a value of zero in all cases in the census-based approach. It is unclear how this is appropriate in all cases, for example where plants may grow in the absence of the plantings in a baseline case. |
| **Round 1 NCR/CL/OFI** | CL: Please address the finding and clarify how a zero baseline is appropriate in all cases. |
| **Round 1 Response from Methodology Developer** | The project boundary in the census-based approach is not the space within which a tree is planted. It is the tree itself, which where additionality is demonstrated (via barrier analysis), would not have otherwise been propagated and established. Other plants may grow and become established in a baseline scenario, but not the tree accounted as a with-project planting unit, which must be "directly planted through the project activity." We have added the constraint: "The project activity takes place within an area with pre-existing tree canopy cover < 30% and/or subject to an agricultural land use." to specify conditions where a zero baseline is valid (i.e. where growing space is unlikely to be occupied by a newly-established tree in the baseline). |

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| **Aster Global Findings - Round 2** | Please clarify how the R1 Response is compatible with the statement in Sect 5, "Note that the project boundary must be delineated even for the census-based quantification approach".<br>Further, if the Census-basis has "No spatial accounting boundary", per Table 1, how does one assess Emissions from any nitrogen fertilizer application when these are calculated on an areal basis?<br>In addition, how does a user apply Eq 28 in such a way as to avoid non-overlap when both the area-basis and census-basis are employed? |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please provide sufficient text to enable a user to "delineate" the project boundary whether on an areal or non-areal basis, In such a way that will,<br>CL: Provide clarity for the application of Eq 22 when using the census-basis, and<br>CL: Provide sufficient text to explain how to avoid overlap between the area-basis and census-basis. |
| **Round 2 Response from Methodology Developer** | Accounting of N2O fertilizer emissions now changed to exclude area component (now solely mass-based) to avoid confusion (e.g. when using the census-based approach). Guidance on delineation of project boundary for census-based approach (to avoid overlap) now provided in Section 5. |
| **Aster Global Findings - Round 3** | The assessment team notes that the project area, when using the census-based approach is 10-m around each planting unit. The assessment team believes this will assist users in determining project areas and allow for separation of adjacent areas, which include both instances of areas-bases and census-bases. This item is addressed. |

| **Item Number** | 43 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 3.6.4 Where carbon would have been lost in the baseline scenario due to land use conversion or disturbance, GHG emissions from soil carbon, belowground biomass, wood products and dead wood carbon pools generally occur over a period of time following the event. It shall not be assumed that all GHG emissions from these carbon pools in the project categories specified below occur instantaneously or within a short period of time. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | It is unclear whether and or/how the methodology addresses this item. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the approaches for the described baselines meet the requirement. |
| **Round 1 Response from Methodology Developer** | No losses of carbon in the baseline scenario are accounted. |
| **Aster Global Findings - Round 2** | As it is conservative to exclude losses in the baseline scenario, this item is addressed. |

| **Item Number** | 44 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.6.6** Where ARR or IFM projects include harvesting, the loss of carbon due to harvesting shall be included in the quantification of project emissions. The maximum number of GHG credits available to projects shall not exceed the long-term average GHG benefit. The GHG benefit of a project is the difference between the project scenario and the baseline scenario of carbon stocks stored in the selected carbon pools and adjusted for any project emissions of N2O, CH4 and fossil-derived CO2, and leakage emissions. The long-term average GHG benefit shall be calculated using the following procedure: |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | |
| Aster Global Round 1 Findings | It is unclear how the methodology as presented meets this requirement when harvesting is included. |
| Round 1 NCR/CL/OFI | CL: Please clarify within the methodology where this requirement is met. |
| Round 1 Response from Methodology Developer | The LT average procedure for setting a threshold on emission reductions in cases where harvesting occurs is not treated in the methodology, as it is covered under the VCS Methodological Requirements |
| Aster Global Findings - Round 2 | As this is a methodological requirement, it is unclear why it is not covered by the methodology. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please address assessor findings. |
| Round 2 Response from Methodology Developer | In Section 8.5, we have added "Where the project activity includes harvesting, the project must also follow guidance in the current version of the VCS Standard for applying the long-term average GHG benefit as an upper limit on calculated NGRs." Note that the guidance on the LTA to be followed is in the VCS Standard, *not* the Methodology Requirements document. |
| Aster Global Findings - Round 3 | The Methodology Developers have added text to state users must employ the long term average approach where harvesting occurs. This finding is closed. |

| Item Number | 45 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | **3.7.3** Leakage that is determined, in accordance with Section 3.3.6, to be below de minimis (i.e., insignificant) does not need to be included in the GHG emissions accounting. The significance of leakage may also be determined using the CDM A/R methodological tool Tool for testing significance of GHG Emissions in A/R CDM Project Activities. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | VCS ARR Methodology 3May2022 CLEAN (1).pdf, Appendix B; ARR Leakage Tool_Rev_29April2022_clean.docx |

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| **Aster Global Round 1 Findings** | The ARR Methodology includes methods for excluding insignificant emission sources and/or changes in carbon pools, including leakage, in Appendix B. The equation in Appendix B is computationally almost identical to the equation used in the identify CDM A/R Tool for testing significance of GHG Emissions.<br><br>Section 3.7.3 of the Methodology Requirements provides the allowance for projects to use the CDM Tool for testing significance, while this methodology includes its own significance determination in Appendix B. |
| **Round 1 NCR/CL/OFI** | OFI: Appendix B should include a statement allowing a project to utilize the CDM tool if they opt to do so, in line with Section 3.7.3 of the Methodology Requirements. |
| **Round 1 Response from Methodology Developer** | The procedure in Appendix B is a direct copy of the CDM tool, and is included to avoid need for reliance on external (especially CDM) documents and tools. |
| **Aster Global Findings - Round 2** | Although possible confusion still exists, since this was an OFI, it can be considered addressed. |

| **Item Number** | 46 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.7.10** Where deforestation increases outside the project area due to leakage from project activities, methodologies shall set out criteria and procedures for projects to assess and quantify the effects of this deforestation on all carbon pools, unless determined to be de minimis (as set out in Section 3.3.6) or conservatively excluded (as set out in Section 3.3.7). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | VCS ARR Methodology 3May2022 CLEAN (1).pdf, ARR Leakage Tool_Rev_29April2022_clean.docx |
| **Aster Global Round 1 Findings** | It is unclear how the leakage module as currently written accounts for leakage "set(s) out criteria and procedures for projects to assess and quantify the effects of this deforestation on all carbon pools." |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | The methodology requires project proponents to use the new leakage tool for ARR projects which is currently under validation. This tool lays out procedures to assess and quantify emissions in all carbon pools from project activities that displace agricultural production which could result in deforestation as required by the VCS Methodology Requirements (in sections 3.7.9 and 3.7.10) |
| **Aster Global Findings - Round 2** | The provided clarification is sufficient to close the identified finding. |

| **Item Number** | 47 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.8.4** AFOLU methodologies shall establish procedures for quantifying the net change in carbon stocks, so that the number of buffer credits withheld in the AFOLU pooled buffer account and market leakage emissions may be quantified for the project. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | N/A |
| **Aster Global Round 1 Findings** | The assessment team did not note any mention of estimating buffer credits in the methodology. It is unclear how this requirement has been met. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | Application of the risk tool and withholding of buffer credits is not included in all AFOLU methodologies and is excluded (unnecessary, imposed by VCS Standard) here. |
| **Aster Global Findings - Round 2** | Assessor agrees that the underlying requirement is to "establish procedures for quantifying the net change in carbon stocks, so THAT the number of buffer credits… may be quantified." This is inherently covered under the requirements of the VCS Standard. This item is addressed. |

| **Item Number** | 48 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.8.5** AFOLU methodologies shall include procedures to determine the number of GHG credits issued to projects, which is determined by subtracting out the buffer credits from the net GHG emission reductions or removals (including leakage) associated with the project. The buffer credits are calculated by multiplying the non-permanence risk rating (as determined by the AFOLU Non-Permanence Risk Tool) times the change in carbon stocks only. The full rules and procedures with respect to assignment of buffer credits are set out in the VCS Program document Registration and Issuance Process. This calculation process is illustrated in the example below. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | N/A |
| **Aster Global Round 1 Findings** | It is unclear how this requirement has been met. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | Application of the risk tool and withholding of buffer credits is not included in all AFOLU methodologies and is excluded (unnecessary, imposed by VCS Standard) here. |
| **Aster Global Findings - Round 2** | Assessor agrees that the underlying requirement is to "establish procedures for quantifying the net change in carbon stocks, so THAT the number of buffer credits… may be quantified." This is inherently covered under the requirements of the VCS Standard. This item is addressed. |

| **Item Number** | 49 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3.9.5** Where measurement plots or data from research plots are used to calibrate belowground biomass, soil carbon and dead wood decay models (as described above in Section 3.6.4), sound and reliable methods for monitoring changes in carbon stocks, including representative location of samplings sites and sufficient frequency and duration of sampling shall be applied. In addition, plots used to calibrate soil carbon models shall be measured considering appropriate sampling depths, bulk density and the estimated impact of any significant erosion (or plots with significant erosion shall be avoided). Data used to calibrate belowground biomass and dead wood models shall consider an estimation of oven-dry wood density and the state of decomposition. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | VCS ARR Methodology sec. 8.2.7, parameter table for CWP-soil,t |
| **Aster Global Round 1 Findings** | The parameter table instructs the user to consult a number of publications for the soil sampling tasks, including some very old and sometimes outdated references.<br><br>The table recommends a sampling frequency of 10 years or less, with no discussion on how to choose an appropriate sampling frequency. No guidance is provided on which of the many lab analysis methods. included in Nelson and Sommers, is appropriate, or how to determine appropriateness.<br><br>No discussion is provided regarding choosing representative sites sampling sites or assessing potential for erosion, although some general references are provided. |
| **Round 1 NCR/CL/OFI** | CL: Please update Nelson and Sommers reference to the 1996 version.<br><br>Please include some discussion about recommended lab methods, as some may be too crude for a carbon project.<br><br>Please include some discussion of how to assess whether a chosen sample plot is appropriate for sampling. |
| **Round 1 Response from Methodology Developer** | The parameter table is identical to the table in VM42 |
| **Aster Global Findings - Round 2** | The assessment team confirmed that the parameter table is identical to VM0042. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | Pending resolution of finding 159. |
| **Aster Global Findings - Round 4** | This finding is closed following resolution of findings pertaining to parameter CWPsoil,t |

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| **Item Number** | 50 |
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 4.4.2 Methodologies and methodology revisions shall be prepared using the VCS Methodology Template and modules and tools shall be prepared using the VCS Module Template. All instructions in the templates must be followed. The methodology documentation shall state clearly the date on which it was issued and its version number. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology document |
| **Aster Global Round 1 Findings** | It is unclear if the required template has been used, as the header does not align with the required VCS header. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify if the latest VCS Methodology Template was used, and clarify if the header is allowed to be altered to include the name of the current methodology, as the assessor believes the original VCS header should remain. |
| **Round 1 Response from Methodology Developer** | Header has been adjusted. |
| **Aster Global Findings - Round 2** | Pending response to Finding 1. |

| **Item Number** | 51 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 6.2.1<br>1) The methodology developer shall list the approved or pending methodologies, under the VCS Program or an approved GHG program, that fall under the same sectoral scope or same AFOLU project category3 or combination of sectoral scopes or AFOLU project categories, as applicable. The list shall include, at a minimum, all such methodologies that are available sixty days before the proposed methodology is submitted to Verra. Such list of methodologies ("listed methodologies") shall contain the methodology name and reference number, and the GHG program under which it is approved or pending. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Table 1, CDM website, VCS website |
| **Aster Global Round 1 Findings** | It appears all similar CDM large-scale and small-scale ARR methodologies are included in Table 1 of the current methodology. Due to the applicability conditions currently including possible wetland projects, it is unclear if this table comprehensively includes all similar wetland methodologies. For example, VM0024 Methodology for Coastal Wetland Creation, may have similarities for any aspect allowed in this methodology related to wetlands. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify if any wetland methodologies need to be added to this table. |
| **Round 1 Response from Methodology Developer** | The methodology is not applicable to WRC activities. |
| **Aster Global Findings - Round 2** | As all WRC references have been removed, this item is addressed. |

| **Item Number** | 52 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 2) The methodology developer shall state whether, and explain how, the proposed methodology uses, includes, refers to or relies upon all or part of any of the listed methodologies. Where it does, the methodology developer shall demonstrate that none of the identified methodologies ("similar methodologies") could have been reasonably revised (i.e., developed as a methodology revision) to meet the objective of the proposed methodology. The onus is upon the methodology developer to demonstrate that a methodology revision would not have been more appropriate, failing which the proposed methodology shall not receive a positive assessment from the validation/verification body. Examples that sufficiently demonstrate the requirement for a new methodology include, but are not limited to, the following: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Table 1 |
| **Aster Global Round 1 Findings** | There are currently no VCS ARR methodologies. Therefore, this methodology will be the first and is not able to use components of a VCS-listed methodology. Table 1 of the methodology does list similar CDM methodologies and describes how accounting of carbon pools is pulled from ACM0003, while the current methodology modifies accounting of the baseline and additionality.<br><br>The current methodology does not "explain how" these components were used from ACM0003 in more detail besides the above summary. Further, it does not demonstrate how these could not have been reasonably revised. Although the existing methodologies are CDM, since Table 1 lists them, the assessor believes the table should further contain the required verbiage from this VCS Methodology Requirement (see examples a-f of the requirement).<br><br>Finally, the above Finding mentions the other wetland methodologies, which has implications for Table 1 requirements here. The "Methodology" column of Table 1 should also include other VCS wetland methodologies, if wetland activities are included in the applicability conditions and also in the "Comments" column of Table 1. |
| **Round 1 NCR/CL/OFI** | CL: Please address the Findings. |
| **Round 1 Response from Methodology Developer** | Table 1 has been updated. |

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| **Aster Global Findings - Round 2** | The language added to Table 1 now addresses how these components were used or considered.<br><br>The first comment states "ACM0003 uses a project method to demonstrate additionality and establish a crediting baseline. The new methodology provides a performance method as part of the area-based quantification approach" but should include a factual statement that "While the new methodology also includes a project method…, it also includes a performance method…" to ensure it is clear that it is not a performance method-only methodology.<br><br>The second comment states "ACM0003 has procedures for the quantification of carbon pools in the project scenario are used in the new methodology." This is not a sentence and should be revised.<br><br>The fourth comment has an unecessary comma after "ARR methodology," which is only being mentioned here because of the above two items. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the first and second comment Findings.<br><br>OFI: Please remove the unnecessary comma. |
| **Round 2 Response from Methodology Developer** | Table 1 amended in response to finding. |
| **Aster Global Findings - Round 3** | The revisions to the methodology are sufficient to close the identify finding. Item closed. |

| **Item Number** | 53 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | TITLE PAGE: Complete all items in the box on the title page using Arial or Century Gothic 10.5 point, black, regular (non-italic) font. This box must appear on the title page of the final document. Methodologies may also feature the project title and preparers' name, logo and contact information more prominently on the title page, using the format below (Arial or Century Gothic 24 point and Arial or Century Gothic 12 point, black, regular font). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Title Page |
| **Aster Global Round 1 Findings** | The official name of the Methodology is conflicting between the giant text on cover page and the box text. Note the word "activities" at the end of the box text.<br><br>Additionally, there are typos in the "Prepared by" and "Contact" boxes |
| **Round 1 NCR/CL/OFI** | CL: Please ensure the official title of the methodology is consistent in all locations (e.g., report cover page, internal text, and listing/APX page).<br>CL: Please correct the referenced typos. |
| **Round 1 Response from Methodology Developer** | Formatting to be completed by final technical editor following resolution of technical findings. Scope 14 removed from header (to align with current methodology template). |

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| **Aster Global Findings - Round 2** | The methodology developer states that formatting will be completed by final technical editor. However, the inconsistent formatting in the current version of the methodology impedes the readability of the document. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please correct the referenced inconsistent formatting to improve readability. |
| **Round 2 Response from Methodology Developer** | Title page has been formatted to fit VCS Methodology Template 4.2. A final technical edit will occuring during the Verra review to address any noted discrepancies (e.g. the removal of table of similar methodologies) |
| **Aster Global Findings - Round 3** | The assessment team confirmed that the appropriate formatting is used on the title page of the methodology. Final final formatting will be assessed in the technical review. Item closed. |

| **Item Number** | 54 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | The methodology must use key words “must,” “should,” and “may” appropriately. Consistent with best practice, “must” is to be used to indicate a firm requirement, “should” is to be used to indicate a (non-mandatory) recommendation, and “may” is to be used to indicate a permissible or allowable option. The term “shall” is reserved for VCS Program documents and is generally not appropriate for methodologies. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 7, Step 2b1)<br><br>9.2 Data and Parameters Monitored |
| **Aster Global Round 1 Findings** | Step 2b.1 states "The barriers should not be specific to the project or the project proponent(s)." This includes a potential misusage of "should," as this requirement appears mandatory.<br><br>The VVB noted that the term "shall" is used in the description section of "Afert,t." The template states that shall is not appropriate for methodologies. |
| **Round 1 NCR/CL/OFI** | CL: Please address in line with the findings. |
| **Round 1 Response from Methodology Developer** | "Should" term eliminated in this context and "shall" universally replaced with "must" |
| **Aster Global Findings - Round 2** | The assessment team confirmed that "shall" has been replaced with must." However, multiple instances of the use of "shall" (including the use referenced in the finding) are still included in the methodology. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address in line with the findings. |
| **Round 2 Response from Methodology Developer** | All instances of shall replaced w must. The two flagged instances have been deleted (re Afert and investment barrier) |
| **Aster Global Findings - Round 3** | The assesment team confirmed that all instances of "shall" have been removed from the methodology. Item closed. |
| **Aster Global Findings - Round 5** | New revisions have re-introduced the directive "shall". I.e., revisions in 7 Additionality Step 2b have changed "may" to "shall". The template states that shall is generally not appropriate for methodologies. |
| **Round 5: NCR/CL/OFI** | CL: Please determine the use of "shall" is justified in this context. |

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| **Round 5 Response from Methodology Developer** | CL: Please determine the use of "shall" is justified in this context. |
| **Aster Global Findings - Round 6** | Item addressed. Finding closed. |

| **Item Number** | 55 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Unless applying a merited deviation, please complete all sections using Arial or Franklin Gothic Book 10.5 point, black, regular (non-italic) font. Where a section is not applicable, explain why the section is not applicable (i.e., do not delete the section from the final document and do not only write "not applicable"). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team noted that body font size is inconsistent throughout the methodology. According to the template, it should be 10.5. |
| **Round 1 NCR/CL/OFI** | CL: Please address in line with the findings. |
| **Round 1 Response from Methodology Developer** | Formatting to be completed by final technical editor following resolution of technical findings. |
| **Aster Global Findings - Round 2** | The methodology developer states that formatting will be completed by final technical editor. However, the inconsistent formatting in the current version of the methodology impedes the readability of the document. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please correct the referenced inconsistent formatting to improve readability. |
| **Round 2 Response from Methodology Developer** | Document has been formatted to fit VCS Methodology Template 4.2. |
| **Aster Global Findings - Round 3** | The assessment team confirmed that the appropriate font is used in the body of the methodology, noting that smaller font is used in tables/footnotes. The VB determined this is appropriate for their assessment, but final formatting will be assessed in the technical review. Item closed. |

| **Item Number** | 56 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **Relationship to Approved or Pending Methodologies** For methodologies using a performance method for determining both additionality and the crediting baseline, list all methodologies under the VCS Program or an approved GHG program that are applicable to similar project activities and that use a project method for determining the crediting baseline. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Table 1, CDM website, VCS website |

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| **Aster Global Round 1 Findings** | This methodology does allow a performance method to be used as one of the options. This requirement in the Verra template is somewhat unclear to the assessment team. Therefore, it is unclear how this requirement has been met in Table 1. |
| **Round 1 NCR/CL/OFI** | CL: Please distinguish in Table 1 (or another table) CDM ARR methods that use project methods for determining the crediting baseline, specifically using the term "project" methods to distinguish. Alternatively, demonstrate how this requirement has already been met or is not required. |
| **Round 1 Response from Methodology Developer** | Table 1 has been updated to reflect that this methodology will allow the use of a performance method and that existing methodologies use project methods. |
| **Aster Global Findings - Round 2** | The changes now satisfy this finding and it is closed. |

| Item Number | 57 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **3 Definitions**<br>Using the format in the example below, provide, in alphabetical order, definitions of key terms and acronyms that are used in the methodology. Ensure all defined terms are used in the methodology. Do not include terms already defined under the VCS Program. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology, Section 3 Definitions |
| **Aster Global Round 1 Findings** | The assessment team reviewed the definitions provided and noted that a number of terms appearing throughout the methodology remain undefined. |
| **Round 1 NCR/CL/OFI** | CL: Please provide clear definitions for all important terms to allow a user to correctly interpret the methodology as presented. |
| **Round 1 Response from Methodology Developer** | Term definitions now added to Appendix A. DBH acronym not used. |
| **Aster Global Findings - Round 2** | Pending inclusion of identified key terms, per Finding 24. |
| **Aster Global Findings - Round 4** | The assessment team affirms all key terms have been defined; however, undefinied acronyms are used (i.e., dbh) |
| **Round 4: NCR/CL/OFI** | CL: Please provide clear definitions for all acronyms used to allow a user to correctly interpret the methodology as presented. |
| **Round 4 Response from Methodology Developer** | first instance of dbh defined as diameter at breast height. No other undefined acronyms noted. |
| **Aster Global Findings - Round 5** | The assessment team confirmed this correction has been made and this finding is closed. |

| Item Number | 58 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **4 Applicability Conditions**<br>Describe the project activity(s) to which the methodology applies. Then, set out specific applicability criteria that define project eligibility, such as geographic location, technology type, historical land use, and any other conditions under which the methodology is applicable. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the section and noted that Table 1. "Quantification approaches and applicability conditions" and two paragraphs above the table do not speak to project eligibility, but rather baseline application. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how these elements define project eligibility, or move this material to the baseline section of the methodology. |
| **Round 1 Response from Methodology Developer** | Table 1 and the referenced paragraph lay out the two fundamental quantification approaches, which go far beyond baselines to what are the units of activity data, what is the multiplier, and are appropriately treated here in this section. |
| **Aster Global Findings - Round 2** | The assessment team had determine this is appropriate. Item closed. |

| **Item Number** | 59 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | · For performance methods, this section must specify the technologies and/or measures (or examples of technologies and/or measures) that can be implemented (in order to achieve substantial performance improvement relative to the crediting baseline) under the methodology. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4 |
| **Aster Global Round 1 Findings** | It is unclear where in Section 4 information to meet this requirement is included. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | The performance benchmark is activity agnostic, and valid regardless of the particular ARR activity implemented. Nonetheless, the first applicability condition requires that "1. The project activity qualifies as afforestation, reforestation or revegetation. This may include direct (e.g. manual planting, broadcast seeding) and indirect activities (e.g. activities that permit or facilitate natural regeneration, like herbivory exclosures" |
| **Aster Global Findings - Round 2** | The provided clarification is sufficient to close the identified finding. |

| **Item Number** | 60 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | · The list of applicability conditions may contain exclusions (i.e., may describe types of project activities to which the methodology does not apply). |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4 |
| **Aster Global Round 1 Findings** | The methodology lists conditions under which the methodology is not applicable. However, the numbering in this section appears to be a continuation of the conditions under which the methodology is applicable (i.e. numbering starts at "3.") |
| **Round 1 NCR/CL/OFI** | OFI: Please consider updating the numbering of this section to clearly indicate the difference between applicability conditions and conditions under which the methodology is not applicable. |
| **Round 1 Response from Methodology Developer** | Numbering revised as suggested |
| **Aster Global Findings - Round 2** | The numbering was revised as suggested by the issued OFI. Item closed. |

| **Item Number** | 61 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **5 Project Boundary**<br>Describe the project boundary and identify the GHG sources, sinks and reservoirs (controlled by the project proponent, related to the project or affected by the project) included in or excluded from the project boundary. Specify where GHG sources, sinks and reservoirs are optional. Include any procedures and/or diagrams, as appropriate. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Table 2 of the methodology template was not utilized in line with the requirements. However, since Table 2 in the ARR Meth is a standard table we see throughout all other methodologies, and since the ARR Met does include Table 3 (Table 2 from the Meth Template), this is acceptable. |
| **Round 1 NCR/CL/OFI** | NCR: Please ensure correct application of the template tables, as required by the methodology template. |
| **Round 1 Response from Methodology Developer** | Table 3 matches Table 2 (covering sources) of the methodology template. No specific format is specified for pools (methodology table 2). |
| **Aster Global Findings - Round 2** | The inclusion of both tables is appropriate and provides additional clarity. Item closed. |

| **Item Number** | 62 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | For AFOLU methodologies, describe the procedures for establishing rates of land-use and land-cover change, identifying historical management practices, establishing common practice, and/or identifying current and/or historical ecological characteristics, as applicable. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 6 |

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| **Aster Global Round 1 Findings** | The assessment team was unable to locate relevant details as specified in the template. |
| **Round 1 NCR/CL/OFI** | NCR: Please "describe the procedures for establishing rates of land-use and land-cover change, identifying historical management practices, establishing common practice, and/or identifying current and/or historical ecological characteristics, as applicable." |
| **Round 1 Response from Methodology Developer** | Procedures are provided in Appendix A, referenced in Section 6. Common practice procedures are now provided for the census-based approach. |
| **Aster Global Findings - Round 2** | The assessment team confirmed procedures are appropriately defined in Appendix A for the area-based approach. However, this item is pending resolution of findings pertaining to common practice procedures for the census-based approach. |
| **Aster Global Findings - Round 5** | The common practice procedures for the census-based approach are described in the additionality section. However, the baseline section (6) of the methodology does not contain the required level of detail, as dictated by the methodology template instructions. |
| **Round 5: NCR/CL/OFI** | CL: Though it may seem redundant, the baseline section of the methodology does not contain the required template verbiage. This section may reference other sections of the methodology, but specifically for the census-based approach, the details regarding "procedures for establishing rates of land-use and land-cover change, identifying historical management practices, establishing common practice, and/or identifying current and/or historical ecological characteristics, as applicable" are lacking. |
| **Round 5 Response from Methodology Developer** | • Clarity on baseline conditions/context for the census-based approach |
| **Aster Global Findings - Round 6** | The assessment team has reviewed the additional text under 9 Baseline and deems it as sufficiently meetinis requirement, specifically with regards to establishing the land-use/land-cover, common practice and identifying current (i.e., past 10 yr) characteristics. This finding is closed. |

| **Item Number** | 62.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 8.1 Baseline Emissions<br>Use the example format below (copy and paste) for specifying equations and defining the associated parameters and variables, including the unit of measure. Ensure all equations are numbered using captions to specify the equation number and enable cross-referencing. Ensure that parameters and variables are consistently applied throughout the equations in the methodology. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology/8 Quantification of GHG Emission Reductions and Removals |
| **Aster Global Round 1 Findings** | Pending upon resolution of various findings issued in multiple tabs. |
| **Aster Global Findings - Round 5** | Formatting of equations still contain formatting issues, e.g. the tab indentation for Eq 12 is larger than for Eq 11. |
| **Round 5: NCR/CL/OFI** | CL: Please address in line with finding. |

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| **Round 5 Response from Methodology Developer** | |
| **Aster Global Findings - Round 6** | No response from Meth Dev but assessment team notes some line indentations have been corrected. |

| **Item Number** | 62.2 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 8.2 Project Emissions<br>Describe the criteria and procedures, including relevant equations, for the quantification of GHG emissions and/or removals for the selected GHG sources, sinks and/or reservoirs for the project. Follow the instructions for equations provided in Section 8.1 (Baseline Emissions) above. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology/8 Quantification of GHG Emission Reductions and Removals |
| **Aster Global Round 1 Findings** | Pending upon resolution of various findings. |
| **Aster Global Findings - Round 5** | The methodology now meets this requirement. However, there should be a differentiation for equations relevant to each approach (census-based versus area-based). |
| **Round 5: NCR/CL/OFI** | CL: Please make a subtitle for each equation differentiating between Area-based Approach or Census-based Approach. If not applicable, add "N/A" under the subtitle. |
| **Round 5 Response from Methodology Developer** | |
| **Aster Global Findings - Round 6** | No response from Meth Dev but assessment team notes some line indentations have been corrected. |

| **Item Number** | 63 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **9.1 Data and Parameters Available at Validation**<br>Complete the table below for all data and parameters that will be determined or available at validation, and remain fixed throughout the project crediting period (copy the table for each data/parameter). Data and parameters monitored during the operation of the project are included in Section 9.2 (Data and Parameters Monitored) below. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 9.1 |
| **Aster Global Round 1 Findings** | Pending resolution of findings of inclusion/completion of all necessary aspects for parameters. |
| **Aster Global Findings - Round 5** | This Finding is being re-opened upon drafting the report. The data and parameters should be clearly delineated for whether they are census-based or area-based. This can be achieved by re-grouping the data and parameter boxes into sub-sections, or denoting in each box to which approach it applies. |

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| **Round 5: NCR/CL/OFI** | CL: Please address the Finding. |
| **Round 5 Response from Methodology Developer** | Organizing pool quantification with subheaders: Area-based quantification and Census-based quantification |
| **Aster Global Findings - Round 6** | The assessment team confirms the revisions have been made. Item closed. |

| Item Number | 63.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **9.1 Data and Parameters Available at Validation** Where the methodology establishes default factors which may become out of date (i.e., default factors that do not represent physical constants or otherwise would be expected to change significantly over time), make note of same in the Comments field. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 9.1 |
| **Aster Global Round 1 Findings** | Multiple parameters in Section 9.1 of the methodology do not meet this requirement. |
| **Round 1 NCR/CL/OFI** | CL: Please ensure this requirement is met for all relevant parameters. |
| **Round 1 Response from Methodology Developer** | The methodology applies the following default values: R (root:shoot), CF (C fraction), DF (litter: AGB), COMF (combustion factor), GWP and MC (manure content). Among these, GWP and MC would be expected to change significantly over time. The parameter table for GWP assigns the default factor from the "*latest* IPCC assessment", and the parameter table for MC has been amended to include "with preference for more recent data from the project country (e.g. ..." |
| **Aster Global Findings - Round 2** | The clarification provided and edits to the methodology are sufficient to close the identified finding. |

| Item Number | 64 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **9.1 Data and Parameters Available at Validation** Data / Parameter |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.1 Parameters table |
| **Aster Global Round 1 Findings** | All relevant parameters are not included. |
| **Round 1 NCR/CL/OFI** | NCR: Please include all relevant parameters. |

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| **Round 1 Response from Methodology Developer** | All relevant parameters (not calculated) are included in sections 9.1 and 9.2. |
| **Aster Global Findings - Round 2** | Pending resolution of findings pertaining to specific parameters. |
| **Aster Global Findings - Round 4** | This finding is pending closure of below findings related to Data and Parameters |
| **Aster Global Findings - Round 5** | There is inconsistent association of data and parameters with the area and census basis, e.g. some parameters state in the data unit if parameters are for the area or census basis whereas this is stated in the 'Description of measurement methods and procedures to be applied' |
| **Round 5: NCR/CL/OFI** | CL: Please ensure consistent reporting of data and parameters consistently with regards to their application for the area and census bases. |
| **Round 5 Response from Methodology Developer** | • Quantification approach specified under purpose of data in parameter tables for 6 flagged parameters |
| **Aster Global Findings - Round 6** | The assessment team confirms the revisions have been made. Item closed. |

| **Item Number** | 65 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Equations: List the equation(s) that use this data/parameter |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.1 Parameters table |
| **Aster Global Round 1 Findings** | Equations in which identified parameters are used are not included for any parameters. |
| **Round 1 NCR/CL/OFI** | NCR: Please include the equations in which identified parameters are used are for all parameters. |
| **Round 1 Response from Methodology Developer** | Equation #s to be added following resolution of technical findings. |
| **Aster Global Findings - Round 2** | Pending closure of technical findings and other findings pertaining to numbering of equations. |
| **Aster Global Findings - Round 4** | Parameters in Sections 9.1 lack a referenced equation.<br><br>Closure of this finding will be re-assessed upon delivery of the penultimate version. |
| **Round 4: NCR/CL/OFI** | CL: Ensure completeness of Data and Parameters |
| **Round 4 Response from Methodology Developer** | Equation numbers are now included. |
| **Aster Global Findings - Round 5** | This requirement is now satisfied |

| **Item Number** | 66 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Value Applied: Indicate the source(s) of data |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | 9.1 Parameters table |
| Aster Global Round 1 Findings | Value applied is not included for multiple parameters. |
| Round 1 NCR/CL/OFI | NCR: Please include value applied for all parameters. |
| Round 1 Response from Methodology Developer | Value applied is now included for all parameters available at validation. |
| Aster Global Findings - Round 2 | Value applied now included for all parameters available at validation. Item closed. |

| Item Number | 67 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Justification of choice of data or description of measurements method and procedures applied: Justify the choice of data source, providing references where applicable. Where values are based on measurement, include a description of the measurement methods and procedures applied (e.g., what standards or protocols have been followed), indicate the responsible person/entity that undertook the measurement, the date of the measurement and the measurement results. More detailed information may be provided in an appendix. |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | 9.1 Parameters table |
| Aster Global Round 1 Findings | Justification of choice of data or description of measurement methods and procedures applied are not included for multiple parameters. |
| Round 1 NCR/CL/OFI | NCR: Please include choice of data or description of measurement methods and procedures applied for all parameters. |
| Round 1 Response from Methodology Developer | Justification of choice of data or description of measurement methods and procedures now provided for all parameters. |
| Aster Global Findings - Round 2 | The assessment team noted that several parameters list "N/A" for this section. |
| Round 2: NCR/CL/OFINCR/CL/OFI | OFI: Please consider including "See source of data above" or similar language in line with other methodologies. |
| Round 2 Response from Methodology Developer | For parameters available at validation, under justification of source of data, "N/A"s replaced with "See source of data above". |
| Aster Global Findings - Round 3 | This was an OFI, so no response was required from the methodology developer. The methodology developer adeuqately addressed the OFI. Item closed. |

| Item Number | 68 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Purpose of Data: Indicate one of the following:<br>• Determination of baseline scenario (AFOLU projects only)<br>• Calculation of baseline emissions<br>• Calculation of project emissions<br>• Calculation of leakage |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | 9.1 Parameters table |
| Aster Global Round 1 Findings | Purpose of data is not included for multiple parameters. |
| Round 1 NCR/CL/OFI | NCR: Please include purpose of data for all parameters. |
| Round 1 Response from Methodology Developer | Purpose of data is now provided for all parameters. |
| Aster Global Findings - Round 2 | The assessment team noted that the "Purpose of data" for parameter "A" does not align with one of the purposes designated by this requirement. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please clarify in line with assessor findings. |
| Round 2 Response from Methodology Developer | Purpose of parameter A revised to "Calculation of project emissions using the area-based quantification approach." |
| Aster Global Findings - Round 3 | The asessement team determined that all parameters include an appropriate "purpose of data" with the exception of parameter Upt. This parameter's purpose of data is listed as "calculation of uncertainty" which while accurate is not one of the selected purposes allowable by the template. |
| Round 3: NCR/CL/OFI | CL: Please ensure "purpose of data" for all parameters is consistent with purposese identified in the methodology tempalte. |
| Round 3 Response from Methodology Developer | In parameter table for Upt, purpose changed to "calculation of project emissions" |
| Aster Global Findings - Round 4 | The assessment team note the change made. This finding is adequately addressed. |

| Item Number | 69 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Comments: Provide any additional comments |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | 9.1 Parameters table |
| Aster Global Round 1 Findings | Comments for several parameters are not completed. Several comments are marked as N/A, or None, or are left blank. |

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| **Round 1 NCR/CL/OFI** | NCR: Please include comments for all applicable parameters. If comments are not applicable, please indicate as such in a consistent manner. |
| **Round 1 Response from Methodology Developer** | Comments now provided for all parameters. Where no comment is included, entry standardized to "no comments" |
| **Aster Global Findings - Round 2** | The assessment team noted that the referenced revisions have not been made. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | NCR: Please include comments for all applicable parameters. If comments are not applicable, please indicate as such in a consistent manner. |
| **Round 2 Response from Methodology Developer** | Blank comments now consistently state "No comments" |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 70 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **9.2 Data and Parameters Monitored**<br>Complete the table below for all data and parameters that will be monitored during the project crediting period (copy the table as necessary for each data/parameter). Data and parameters determined or available at validation are included in Section 9.1 (Data and Parameters Available at Validation) above. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters Table |
| **Aster Global Round 1 Findings** | A blank parameter table is included in this section. |
| **Round 1 NCR/CL/OFI** | NCR: Please remove the blank parameter table from this section. |
| **Round 1 Response from Methodology Developer** | Blank parameter table removed |
| **Aster Global Findings - Round 2** | The assessment team determined the blank parameter table has been appropriately removed. Item closed. |
| **Aster Global Findings - Round 5** | There is inconsistent association of data and parameters with the area and census basis, e.g. some parameters state in the data unit if parameters are for the area or census basis whereas this is stated in the 'Description of measurement methods and procedures to be applied' |
| **Round 5: NCR/CL/OFI** | CL: Please ensure consistent reporting of data and parameters consistently with regards to their application for the area and census bases. |
| **Round 5 Response from Methodology Developer** | • Quantification approach specified under purpose of data in parameter tables for 6 flagged parameters |
| **Aster Global Findings - Round 6** | The assessment team confirms the revisions have been made. Item closed. |

| **Item Number** | 71 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Data / Parameter |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters Table |
| **Aster Global Round 1 Findings** | All relevant parameters are not included. |
| **Round 1 NCR/CL/OFI** | NCR: Please include all relevant parameters. |
| **Round 1 Response from Methodology Developer** | Parameter tables for litter biomass and nburn,t have been added. |
| **Aster Global Findings - Round 2** | The assessment team confirmed the referenced parameter tables have been added. However, this item is pending resolution regarding inclusion of parameters identified in the "parameters" and "equations" sections. |
| **Aster Global Findings - Round 4** | This finding is pending closure of below findings related to Data and Parameters |
| **Aster Global Findings - Round 6** | This finding is closed following closure of below findings related to Data and Parameters |

| **Item Number** | 72 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Equations: List the equation(s) that use this data/parameter |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters table |
| **Aster Global Round 1 Findings** | Equations in which identified parameters are used are not included for any parameters. |
| **Round 1 NCR/CL/OFI** | NCR: Please include the equations in which identified parameters are used are for all parameters. |
| **Round 1 Response from Methodology Developer** | To be completed after all technical findings resolved. |
| **Aster Global Findings - Round 2** | Pending closure of technical findings and other findings pertaining to numbering of equations. |
| **Aster Global Findings - Round 4** | Parameters in Sections 9.1 and 9.2 lack a referenced equation.<br><br>Closure of this finding will be re-assessed upon delivery of the penultimate version. |
| **Round 4: NCR/CL/OFI** | CL: Ensure completeness of Data and Parameters |

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| **Round 4 Response from Methodology Developer** | Equation numbers are now included. |
| **Aster Global Findings - Round 5** | B_WP-woody-AB,pu,t appears in Equation 7, but it's respective Data and Parameters table states the parameter is used in Eq 11. |
| **Round 5: NCR/CL/OFI** | CL: Please address finding, |
| **Round 5 Response from Methodology Developer** | Ref in BWP-woody-AB,pu,t parameter table corrected to eq 7 |
| **Aster Global Findings - Round 6** | The assessment team confirms the revisions have been made. Item closed. |

| **Item Number** | 73 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Source of Data: Indicate the source(s) of data |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters table |
| **Aster Global Round 1 Findings** | Source of data is not included for all identified parameters. All sources do not require Project developers to examine the most recent version of referenced documents, where they may have been updated (for example IPCC, 2006). |
| **Round 1 NCR/CL/OFI** | NCR: Please include sources of data for all identified parameters. NCR: Please update all document sources to include reference to the most recent version, in line with Section 1 of the methodology requirements. |
| **Round 1 Response from Methodology Developer** | Source of data is now included for all parameters. Sources have been clarified to use most recent versions of IPCC assessment reports. |
| **Aster Global Findings - Round 2** | The assessment team determined source of data has been included for all parameters in this section and that most recent version of IPCC assessment reports are to be used. Item closed. |

| **Item Number** | 74 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Description of measurement methods and procedures to be applied: Specify the appropriate measurement methods and procedures and any standards or protocols that must be followed. Include any relevant information regarding the accuracy of the measurements (e.g., accuracy associated with meter equipment or laboratory tests). |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters table |
| **Aster Global Round 1 Findings** | Description of measurement methods and procedures to be applied are not included for all identified parameters. |

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| **Round 1 NCR/CL/OFI** | NCR: Please include description of measurement methods and procedures to be applied for all parameters. |
| **Round 1 Response from Methodology Developer** | Descriptions of measurement methods and procedures for all parameters now provided. |
| **Aster Global Findings - Round 2** | Description of measurement methods and procedures now appropriately included for all parameters. Item closed. |

| **Item Number** | 75 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Frequency of monitoring/recording: Specify measurement and recording frequency |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters Table |
| **Aster Global Round 1 Findings** | Frequency of monitoring/recording is included for all identified parameters. However, several parameters are labeled "Frequency" instead of "Frequency of monitoring/recording" as identified in the template. |
| **Round 1 NCR/CL/OFI** | NCR: Please ensure that the correct template format is used for all parameters. |
| **Round 1 Response from Methodology Developer** | "Frequency" revised to "Frequency of monitoring/recording" in parameter tables. |
| **Aster Global Findings - Round 2** | "Frequency" is still used for parameter nburnt,. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | "Frequency" revised to "Frequency of monitoring/recording" for nburn |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 76 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | QA/QC procedures to be applied: Describe the quality assurance and quality control (QA/QC) procedures to be applied, including the calibration procedures where applicable |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters Table |
| **Aster Global Round 1 Findings** | QA/QC Procedures to be applied are not included for all identified parameters. |

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| Round 1 NCR/CL/OFI | NCR: Please included QA/QC procedures to be applied for all parameters. |
| Round 1 Response from Methodology Developer | QA/QC procedures are included in the parameters measured under "Description of measurement methods and procedures to be applied" or specified in QA/QC when particular attention is needed to ensure data quality. |
| Aster Global Findings - Round 2 | QA/QC procedures included for relevant parameters. However, QA/QC sections are still left blank for multiple parameters. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: If no QA/QC procedures are to be applied, then please indicate as such. |
| Round 2 Response from Methodology Developer | QA/QC section filled in all tables. Again, in many cases QA/QC procedures are included under "Description of measurement methods and procedures to be applied", where we reference "See Description of measurement methods and procedures to be applied" under QA/QC |
| Aster Global Findings - Round 3 | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| Item Number | 77 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Calculation Method: |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | 9.2 Parameters Table. |
| Aster Global Round 1 Findings | Calculation methods for several parameters are not completed. Several calculation methods are marked as Not applicable, N/A, or left blank. |
| Round 1 NCR/CL/OFI | NCR: Please include calculation methods for all parameters. If calculation methods are not applicable, please indicate as such in a consistent manner. |
| Round 1 Response from Methodology Developer | Calculation method addressed for all monitored parameters. |
| Aster Global Findings - Round 2 | The assessment team noted that calculation method is noted as "N/A" for all parameters. It is unclear how this is appropriate, as multiple parameters involve calculation. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please address assessor findings. |
| Round 2 Response from Methodology Developer | Calculation method is not "N/A" for all parameters. |
| Aster Global Findings - Round 3 | The assessment team confirmed that an appropriate calculation method is described for all parameters. Item closed. |

| Item Number | 78 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Comments: |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 9.2 Parameters Table |
| **Aster Global Round 1 Findings** | Comments for several parameters are not completed. Comments are left blank or marked N/A. |
| **Round 1 NCR/CL/OFI** | NCR: Please include comments for all applicable parameters. If comments are not applicable, please indicate as such in a consistent manner. |
| **Round 1 Response from Methodology Developer** | Parameters with no comments now consistently state "no comments" |
| **Aster Global Findings - Round 2** | The assessment team noted that the referenced revisions have not been made. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | NCR: Please include comments for all applicable parameters. If comments are not applicable, please indicate as such in a consistent manner. |
| **Round 2 Response from Methodology Developer** | Comments completed for all parameters. Blank comments now consistently state "No comments" |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 79 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | ***10*** ***References***<br>*Include any references relevant to the methodology.* |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | 10 References Section |
| **Aster Global Round 1 Findings** | The assessment team noted that the improper citation for IPCC GPG 2003 is listed in the reference section. Additionally, all references in the body of the methodology are not included in this section. |
| **Round 1 NCR/CL/OFI** | NCR: Please ensure all references in the body of the methodology are appropriately included and cited. |
| **Round 1 Response from Methodology Developer** | Citation to IPCC GPG 2003 corrected and references section now made inclusive. |
| **Aster Global Findings - Round 2** | Winjum et al. is still included in the "References" section. Olson et. Al is not included in the "References" section. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |

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| **Round 2 Response from Methodology Developer** | References amended to omit Winjum and include Olson et al |
| **Aster Global Findings - Round 3** | Olson et al 2005, Harmon 2011, Holdrige 1967 Warren & Olsen 1964, Ducey et al 2013 and Van Wagner 1968 has a full citation in footnote form but also is in 10 References.<br><br>Ferrao & Hanauer 2014, US EPA 2011 appears in 10 References but not in text.<br><br>Online references not included in 10 References.<br><br>Citations are not properly formatted (use of commas, periods, order of first name initials and surnames) |
| **Round 3: NCR/CL/OFI** | OFI: It is not clear that footnotes should be used to place references as, per the template, "Footnotes may also be used for short additional information." Adding references as footnotes is redundant with Section 10. Please consider revising footnotes.<br>CL: Ensure all references in Section 10 are present in-text.<br>CL: Ensure online references in-text are present in Section 10.<br>CL: Ensure all references in Section 10 are properly formatted. |
| **Round 3 Response from Methodology Developer** | Full citations now removed from footnotes, and Section 10 References complete (added Wendt and Hauser). Footnotes now restricted to further clarifying text and links to online resources referenced. |
| **Aster Global Findings - Round 4** | US EPA 2011 appears in 10 References but not in text. Citations are not properly or consistently formatted (use of commas, periods, order of first name initials and surnames, placement of year), e.g., the following two citations<br>Ducey, M.J., Williams, M.S., Gove, J.H., Roberge, S. and R.S. Kenning. 2013. Distance-limited perpendicular distance sampling for coarse woody debris: theory and field results. Forestry 86(1): 119-128. *uses Author-Year-Article Name-Journal format*<br>Ferraro, P. J. & Hanauer, M. M. Advances in Measuring the Environmental and Social Impacts of Environmental Programs. Annu. Rev. Environ. Resour. 39, 495–517 (2014) *uses Author-Article Name-Journal-Year format, and contains volume but not issue.* |
| **Round 4: NCR/CL/OFI** | CL: Ensure all references in Section 10 are present in-text.<br><br>CL: Ensure all references in Section 10 are properly formatted. |
| **Round 4 Response from Methodology Developer** | US EPA 2011 removed from references section. References now consistently formatted. |
| **Aster Global Findings - Round 5** | The assessment team has confirmed all references are properly cited. |

| **Item Number** | 80 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **Applicability Conditions**<br>· The methodology, to the extent practicable, excludes those classes of project activities that it can be reasonably assumed will be implemented without the intervention created by the carbon market. |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A |
| **Aster Global Round 1 Findings** | It is unclear where within the Appendix A information to satisfy this requirement is located. |
| **Round 1 NCR/CL/OFI** | CL: Please address in line with the findings. |
| **Round 1 Response from Methodology Developer** | The application of the performance benchmark effectively excludes, based on comparative outcomes (delta SI), crediting of outcomes from project activities that may be expected to be implemented without carbon incentives, and ensures that credited projects produce performance improvements relative to the business-as-usual case (represented by delta_SI_control). |
| **Aster Global Findings - Round 2** | The performance benchmark was reviewed again, but it is unclear how either the applicability conditions in the performance benchmark section of the performance method, or the applicability conditions of the methodology "exclude those classes of project activities that it can be reasonably assumed will be implemented without the intervention created by the carbon market. " For example, the Conservation Reserve Program (CRP) provides land owners with funding in exchange for "a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality." This can include payments for purchase and planting of seedlings. Has this, or other such programs been considered. If so, how does the performance benchmark effectively exclude them? |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | The example of the a government subsidy program like CRP was considered in the development of this methodology, and is included in the performance benchmark as an exact matching criteria (policy environment), so a project area potentially eligible under this program would only be paired with control plots similarly eligible, and the influence of that program on GHG outcomes would be borne out in the control plots as observed over time (creating a higher performance benchmark). Note, again, that the application of the performance benchmark effectively excludes, based on comparative outcomes, crediting of project activities that may be expected to be implemented without carbon incentives, because they are represented in the controls and effectively subtracted out through application of the *1-PB deduction, ensuring that credited projects produce performance improvements relative to the business-as-usual case (represented by the crediting baseline). Under applicability conditions in Appendix A, we have added the following explanatory text: "Note that the application of the performance benchmark, as explained below, effectively excludes, based on comparative outcomes, crediting of project activities that may be expected to be implemented without carbon incentives, and ensures that credited projects produce performance improvements relative to the business-as-usual case (represented by the crediting baseline)." *also note that related item #81 is closed* Also, under definitions in Appendix A, USDA Conservation Reserve Program is provided as an example of an Operating government-funded program providing incentives for tree planting. |

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| **Aster Global Findings - Round 3** | By pairing control and project plots with lands subject to the same policy environment, the calculation of the performance benchmark effectively excludes, to the extent reasonably possible, crediting for those activities that could reasonably be assumed to occur without the intervention by the carbon market. The assessment team notes that language has been added in the appendix to illustrate this. This finding is closed. |

| Item Number | 81 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | · Projects implement technologies and/or measures that cause performance improvement relative to the crediting baseline and what is achievable within the sector. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A |
| **Aster Global Round 1 Findings** | It is unclear where within the Appendix A information to satisfy this requirement is located. |
| **Round 1 NCR/CL/OFI** | CL: Please address in line with the findings. |
| **Round 1 Response from Methodology Developer** | The application of the performance benchmark effectively excludes, based on comparative outcomes (delta SI), crediting of outcomes from project activities that may be expected to be implemented without carbon incentives, and ensures that credited projects produce performance improvements relative to the business-as-usual case (represented by delta_SI_control). |
| **Aster Global Findings - Round 2** | The assessment team determined the provided clarification is sufficient to close the identified finding. |

| Item Number | 82 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | · The methodology or performance benchmark is only applicable to the geographic area for which data are available, or that data from one geographic area are representative of another or that it is conservative to apply data from one geographic area to another. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | APPENDIX A: PERFORMANCE METHOD/Applicability Conditions |
| **Aster Global Round 1 Findings** | The assessment team noted "The ARR activity can be clearly delineated spatially, and area calculated using GIS". However, as stated in the methodology, the assessment team were unable to locate any description of geographical region applicability requirements on the performance benchmark in Applicability Conditions section. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in accordance with the findings and include any additional information that is required. |

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| **Round 1 Response from Methodology Developer** | Geographic constraints are explained in detail in Table A1 in the Appendix. |
| **Aster Global Findings - Round 2** | The assessment team determined the provided clarification is sufficient to close the identified finding. |

| **Item Number** | 83 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | All Equations |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team examined and noted that parameters used in equations are undefined in the "where" section of multiple equations. |
| **Round 1 NCR/CL/OFI** | CL: Please review all equations and ensure all parameters are defined in "where" section of each equation. |
| **Round 1 Response from Methodology Developer** | All parameters in equations now listed under "where" |
| **Aster Global Findings - Round 2** | All parameters in equations are not listed under the "where" section. Specific issues identified in relevant equations. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please review all equations and ensure all parameters are defined in "where" section of each equation. |
| **Round 2 Response from Methodology Developer** | All parameters in eqs now listed and described under where. |
| **Aster Global Findings - Round 3** | The assessment team did not identify any additional instances where parameters in eqs were not listed under "Where:" following equations. |

| **Item Number** | 84 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | All Equations |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The methodology allows for the project to apply both the area and census based approached for the same project. However, the methodology does not provide computational methods in line with that approach. |
| **Round 1 NCR/CL/OFI** | CL: Please correct methodology equations in line with the finding. |

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| **Round 1 Response from Methodology Developer** | Following eqs 33 and 34, we have added the following text: "Where the project combines area- and census-based quantification approaches, total NGRs are calculated as the sum of NGRs calculated independently for each approach (applied to non-overlapping areas)." |
| **Aster Global Findings - Round 2** | The assessment team confirmed that the following text has been added, noting that this text is included after equation 28 with the revised numbering. The assessment team that this is an appropriate approach sufficient to close the finding. Item closed. |

| **Item Number** | 85 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | All Equations |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The methodology allows for the use of stratification, however no computational methods are mathematically presented in line with a stratified approach. |
| **Round 1 NCR/CL/OFI** | CL: Please update equations mathematically incorporate stratification. Alternatively, please remove references to stratification. |
| **Round 1 Response from Methodology Developer** | References to any required stratification removed. |
| **Aster Global Findings - Round 2** | The assessment team confirmed all references to stratification have been removed. |

| **Item Number** | 86 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | All Equations |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Linear order of application of equations is unclear as written. |
| **Round 1 NCR/CL/OFI** | CL: Please provide a diagram, or similar explanation to clarify equation application. |
| **Round 1 Response from Methodology Developer** | Diagrams (Figs 8.1 and 8.2) now provided showing order of operations for both approaches. |
| **Aster Global Findings - Round 2** | The assessment team confirmed that diagrams are now included and should be sufficient in providing clarity in linear application of equations. However, while each item in the diagram states that an Equation will be referenced, there are no Equations yet referenced. |

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| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure completeness of diagrams. |
| **Round 2 Response from Methodology Developer** | Equation numbers will be added after completion of VVB review so that final equation sequences can be accurately depicted. |
| **Aster Global Findings - Round 3** | Noting the developer intends to address this finding at a later period, this finding is held open until such time that this is addressed. |
| **Round 3: NCR/CL/OFI** | CL:Please ensure completeness of diagrams. |
| **Round 3 Response from Methodology Developer** | Final formatting of diagrams to be completed after resolution of all technical findings. |
| **Aster Global Findings - Round 4** | Figure 8.1 and 8.2 are not yet formatted. Equations generally use * as the multiplication operator symbol, but Eq 19b and 19c use ×.<br><br>Methodology Developer states this will be addressed following resolution of all technical findings. Closure of this item is pending formatting in the penultimate version of the document. |
| **Round 4: NCR/CL/OFI** | CL: Please use consistent syntax in equations |
| **Round 4 Response from Methodology Developer** | Equation references are now included in Figures 8.1 and 8.2. Use of X in equations 19b and 19c is now *. Note equations 19b and 19c are now 20b and 20c |
| **Aster Global Findings - Round 5** | The assessment team reviewed the figure both for linear structure of equations and to ensure the correct equations were referenced. The figure is now complete. |

| **Item Number** | 87 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | All Equations |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Equations have inconsistent subscripts throughout the methodology and within individual equations and related where statements. |
| **Round 1 NCR/CL/OFI** | CL: Please update all equations to ensure correct and consistent application of subscript use throughout the methodology, ensuring clear and consistent interpretation. |
| **Round 1 Response from Methodology Developer** | Subscripts in equations updated and now consistent throughout. Strata subscripts eliminated (per other finding responses). |
| **Aster Global Findings - Round 2** | The assessment team noted all references to stratification have been removed; however some subscript issues remain. This is pending specific findings related to Equations and Parameters. |
| **Aster Global Findings - Round 3** | All suscript issues have been addressed. This finding is no longer pending and is now closed. |

| Item Number | 88 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Application of Δt |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Round 1 Findings | The application of Δt is applied inconsistently throughout the methodology, leading to confusion. |
| Round 1 NCR/CL/OFI | CL: Please update Δt to be consistent throughout the methodology. |
| Round 1 Response from Methodology Developer | Delta t now constrained to biomass burning, to identify pre burn stocks subject to burning in the interval ending in year t. |
| Aster Global Findings - Round 2 | The assessment team confirms changes have been made, satisfying finding. |

| Item Number | 89 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Application of Δt |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Round 1 Findings | Some equations divide by Δt while some multiply by 1/Δt |
| Round 1 NCR/CL/OFI | OFI: Please consider ensuring consistency in application of Δt throughout all applicable equations. |
| Round 1 Response from Methodology Developer | Eliminated from equations |
| Aster Global Findings - Round 2 | The assessment team confirms changes have been made, satisfying finding. |

| Item Number | 90 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Change in t |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | To determine the change in t some equations utilize the formula Xt2-Xt1 while some use Xt - Xt-Δt. |
| **Round 1 NCR/CL/OFI** | CL: Please ensure consistency in determination of change in t throughout all applicable equations. |
| **Round 1 Response from Methodology Developer** | Time change in equations now consistent. All stock change eqs reference back to time t=0, and calculate cumulative stock change *through* year t. |
| **Aster Global Findings - Round 2** | The assessment team confirms changes have been made, resulting in consistent use of change in t. |

| **Item Number** | 91 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team noted that several equations are computed based on the monitoring interval (e.g. Equation 7) while others appear to be computed since the project start date (Eq 33, 34). It is unclear how this approach allows for consistent application throughout the methodology. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Excellent finding, which we have now addressed. Time change in equations now consistent. All stock change eqs reference back to time t=0, and calculate cumulative stock change *through* year t. Final net emission reductions NGR *in* year t are now calculated as the cumulative emission reductions through year t - cumulative emission reductions through year t-1. This accounting construction matches the form of VM7. |
| **Aster Global Findings - Round 2** | The assessment team notes that calculations have been altered such that NGRs are now determined annually. However, no text accompanies the calculation of NGR which may aid in advising users how to annualize NGR where measurements of parameters are conducted periodically. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please add clarifying text alongside the calculation of NGR for the assessment team to assess. |
| **Round 2 Response from Methodology Developer** | Text in 8.5 now included to guide annualizing NGRs - "Where monitoring intervals exceed one year, periodic NGRs are first calculated for the monitoring interval using the equations above (substituting t-1 for t minus length of monitoring interval in years) and then annualized by dividing periodic NGRs by the length of monitoring interval in years, to produce equal NGRt's assigned to each year in the monitoring interval." |

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| **Aster Global Findings - Round 3** | This does appear to allocate credits ot vintages across any given reporting period, as it does with a linear interpolation as opposed to a growth curve. The earlier vintages could conceivably an overestimate of actual NGRs produced whereas later vintages would be an underestimate. No specific rule could be found in the Methodology Requirements nor any of the other VCS program documents prohibitive linear interpolation to determine vintages. With that stated, this proposed approach would likely result in earlier vintages have a portion of their respective credits not being 'real' for that year. The concern is a buyer might believe that they have offset their emissions for a selected year when it reality those emissions were sequestered in a later year. |
| **Round 3: NCR/CL/OFI** | CL: The assessment team would like to have a discussion with the Methodology Developer to clarify whether this linear interpolation is consistent with VCS rules or would have any substantial impact on buyers' GHG offset claims. |
| **Round 3 Response from Methodology Developer** | Verra has reviewed and discussed this issue internally and determined that the approach does not present a risk of over crediting. As long as the credits represent an ex-post removal or reduction of GHGs it is beyond the scope of the methodology and the VCS to ensure that the vintages of credits align with the buyers' 'vintage' of emissions. Section 4.1.2 of the Registration and Issuance Process states, "Where a verification period includes more than one calendar year, the Verra Registry will display separate vintages for each calendar year within one verification period." We are not aware of any additional guidance in the VCS Standard on the matter. |
| **Aster Global Findings - Round 4** | The assessment team has reviewed the Registration and Issuance Process v 4.3 (the Process), noting the Process requires display of multiple vintage years where the monitoring period spans multiple vintage years. The assessment team has reviewed the Process and other normative documents and finds no guidance, related to the disaggregation of GHG removals/reductions among individual years within a monitoring period.<br><br>The assessment team finds that the methodology's manner of distributing GHG removals/reductions equally across years (Eq. 24) makes no assumptions and is therefore conservative and reasonable. **This item is closed.** |

| **Item Number** | 92 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | All Equations |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Multiple equations are unnumbered or grouped. |
| **Round 1 NCR/CL/OFI** | CL: Please ensure all equations are individually defined, described, and appropriately numbered. |

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| **Round 1 Response from Methodology Developer** | All equations are now numbered. Grouped equations remain grouped to make dependencies clear, but are numbered as e.g. 22a, 22b, 22c. |
| **Aster Global Findings - Round 2** | Equations are not ordered from 1 through n equations. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Equations are now ordered 1 through n |
| **Aster Global Findings - Round 3** | The assessment team confirms correct ordering of equation numbers. This finding shall remain pending however, given that subsequent revisions may impact equation numbering. |
| **Aster Global Findings - Round 4** | Closure of this item (sequential numbering of equations) is pending formatting in the penultimate version of the document. |
| **Aster Global Findings - Round 5** | The assessment team confirmed the equations are sequentially ordered. |

| **Item Number** | 92.1 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 1. (ΔCWP,t ) |
| **Aster Global Findings - Round 2** | ΔCWP-biomass,t is not defined in "where". ΔCWP-biomass is in "where" but is included in the Equation.<br>ΔCWP-SOC,t is not defined in "where". ΔCWP-SOC is in "where" but is included in the Equation.<br>The syntax in the equation is unclear (e.g., multiple minus signs in the subscript).<br>44/12 is undefined in "where".<br>ΔCWP-SOC is described inconsistently through manuscript in the "where" sections.<br>ΔCWP-biomass is described inconsistently through manuscript in the "where" sections.<br>The text accompanying this equation states that Equation 1 is to calculate net greenhouse gas removals but those mathematics occur in Eq 27 and Eq 28 |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | t subscripts added under where to ΔCWP-biomass and ΔCWP-SOC, now consistent w equation. Extra minus sign deleted. 44/12 now defined under where as Ratio atomic weight carbon dioxide : carbon; unitless. ΔCWP-SOC and ΔCWP-biomass are now consistently described throughout. Text accompanying eq. 1 correct, specified that it calculates "net greenhouse gas removals *in the project scenario*" Final eqs calculate net GHG removals "from the project activity", which incorporate baseline and leakage. To avoid confusion, text accompanying eq. 1 altered from "net greenhouse gas removals" to "GHG flux (net removals expressed as a positive value)" |

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| **Aster Global Findings - Round 3** | All subfindings associated with Eq 1 have been corrected and can be closed with one exception:<br>The remaining minus symbol between the last two terms in Eq 1 remains subscripted. |
| **Round 3: NCR/CL/OFI** | CL: Ensure proper formatting of operators in equations. |
| **Round 3 Response from Methodology Developer** | In eq 1, subscripted minus deleted and replaced with un-subscripted minus. |
| **Aster Global Findings - Round 4** | The assessment team finds this formatting issue has been fixed and no further formatting issues exist (other than similar findings which are still pending).<br>**This item is closed.** |

| **Item Number** | 92.2 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 2. (ΔCWP-biomass,t) |
| **Aster Global Findings - Round 2** | The text accompanying Eq 2 states "For the census-based quantification approach, excluded pools (SOC, non-woody biomass and litter) are assigned a value of zero in Equations 1 and 6.". First, it is unclear if dead wood, ΔCWP-DW,t, should be assigned a value of 0 because Table 2 states dead wood is not included under the census-basis. Second, it is unclear why the paragraph references Equation 6 as opposed to Eq 2.<br><br>ΔCWP-DW,t is described inconsistently through manuscript in the "where" sections. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings |
| **Round 2 Response from Methodology Developer** | Eq 2 text now specified that dead wood is an excluded pool using the census-based approach and is assigned a value of zero here. VCS technical editor to correct equation numbering and referencing. ΔCWP-DW,t now described consistently throughout in the "where" sections. |
| **Aster Global Findings - Round 3** | The assessment team confirmed that revisions to the Methodology have sufficiently addressed this finding. |

| **Item Number** | 92.3 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 3. DCWP-woody |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Findings - Round 3** | ΔCWP-woody,t has been changed to DCWP-woody,t in Eq 3. |

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| **Round 3: NCR/CL/OFI** | CL: Ensure D is replaced by Δ |
| **Round 3 Response from Methodology Developer** | In eq 3, D replaced w delta symbol. |
| **Aster Global Findings - Round 4** | Equations 10 and 14 contain D, as opposed to Δ. |
| **Round 4: NCR/CL/OFI** | CL: Ensure D is replaced by Δ, throughout Methodology. |
| **Round 4 Response from Methodology Developer** | D changed to delta symbol under where for eqs 10 and 14 |
| **Aster Global Findings - Round 5** | The assessment team confirms the corrections have been made. |

| **Item Number** | 93 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 8. (CWP-woody,t ) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Equation 8. is used to calculate the carbon stock in woody biomass in the project scenario. A note below the equation states "Where estimations are applied for different tree and/or shrub species, the sum across all the tree and/or shrub species must be calculated." This language needs to be presented as a mathematical component of the equation itself.<br><br>Additionally, in the "where" section parameter R is defined as the Root: shoot ratio for tree or shrub. However there is no mathematical indication in any parameters or the equation itself indicating there may be multiple different species and root: shoot ratios.<br><br>Additionally, a footnote states that woody biomass must have a DBH >= 5 cm. It is unclear to the assessment team how this is appropriate, as DBH itself is not defined as a parameter. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Referenced text deleted. |
| **Aster Global Findings - Round 2** | CWP-woody,t inconsistently described in "where" sections through manuscript |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure consistent descriptions of parameters both within "where" sections of Equations and with Data and Parameters. |
| **Round 2 Response from Methodology Developer** | CWP-woody,t now consistently described in "where" sections throughout |

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| **Aster Global Findings - Round 3** | The definitions of CWP-woody,t are now consistent. |

| **Item Number** | 94 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 10. (CWP-woody,t ) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Parameter Mi,t is undefined in the methodology. Additionally, this equation is pending closure of findings pertaining to sampling methods and Eq. 11 |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Subscript i now removed. Parameter table is included for parameter Mt. |
| **Aster Global Findings - Round 2** | The units for nt, "number", is unclear. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please define a unit for the numeric value associated with nt. |
| **Round 2 Response from Methodology Developer** | nt units now specified as integer |
| **Aster Global Findings - Round 3** | The revisions made have addressed the finding. |

| **Item Number** | 95 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 11. (CWP-woody-AB,pu_avg,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Parameter CWP-woody-AB,pu,i,t is undefined in the methodology. Parameter n,i,t appears defined within a different parameter, but is not defined as a parameter itself.<br><br>The summation and associated parenthesis utilized in this equation are mathematically incorrect. Additionally pending resolution of findings issued pertaining to other parameters used in quantification. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |

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| **Round 1 Response from Methodology Developer** | Parameter CWP-woody-AB,pu,t now has a separate (from the area-based approach) parameter table methodology. Subscripts i (strata) now removed throughout. Equation has been corrected, with parenthesis around terms following summation. |
| **Aster Global Findings - Round 2** | It is unclear why CWP-woody-AB,pu,t uses the term C when CWP-woody-AB,pu is biomass, not carbon stock. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify the units of CWP-woody-AB,pu,t |
| **Round 2 Response from Methodology Developer** | Parameter table now corrected to describe CWP-woody-AB,pu,t in units of biomass (not carbon), and this is now consistent throughout. CWP-woody-AB,pu,t now changed throughout to BWP-woody-AB,pu,t to clarify units of d.m. (not C). |
| **Aster Global Findings - Round 3** | CWP-woody-AB,pu_avg,t is now consistently described as biomass in-text, with appropriate units (dry matter), and the ordinary text in the parameter has changed from C to B to reflect this. This finding is closed. |

| **Item Number** | 96 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 11* (ΔCWP-herb,t ) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear if this equation is supposed to be used for the area based, census based, or both approaches.<br><br>The equation references CFherb as a parameter to be used. However, in the "where" section below, this parameter appears to be CF, the carbon fraction of biomass. CF is defined in the parameters section as the carbon fraction of dry matter. It is unclear to the assessment team what value is to be applied here.<br><br>The assessment team noted that this equation is numbered (11). The previous equation is also numbered (11).<br><br>Additionally pending findings regarding determination of t. |

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| **Round 1 NCR/CL/OFI** | CL: Please clarify how use of the referenced notation is appropriate, given other equations a different form of notation.<br><br>CL: Please clarify which approach this equation is to be used for. If it is not intended to be used for both approaches, please include information regarding calculation for each individual approach.<br><br>CL: Please clarify what parameter and what value are to be used in this equation for the carbon fraction.<br><br>NCR: Please update the numbering of this equation and all subsequent equations. |
| **Round 1 Response from Methodology Developer** | This pool is not included using the census-based approach (per Table 1), and thus only applicable using the area-based approach. CF_herb corrected to CF. Equation corrected to conform with structure of calculations (with delta for all pools calculated as time t - time t=0). All equations are now numbered, with no duplicates. Equation numbering to be finalized following resolution of technical findings. |
| **Aster Global Findings - Round 2** | ΔCWP-herb,t=0 is undefined in "where". |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure all terms in equations are defined. |
| **Round 2 Response from Methodology Developer** | CWP-herb,t=0 in the delta (stock change) equation is defined under "where" with reference to CWP-herb,t. This is consistent with other delta equations, and readily understood by users and VVBs (t value need not be specified in definition under where). |
| **Aster Global Findings - Round 3** | The clarification provided is sufficient to close the identified finding. Item closed. |

| **Item Number** | 97 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 12 (CWP-herb,t ) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear if this equation is supposed to be used for the area based, census based, or both approaches.<br><br>The parameters used in its calculation are not defined by the methodology. Furthermore, there is no information on how the determination of herbaceous biomass should be performed. |

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| **Round 1 NCR/CL/OFI** | CL: Please clarify which approach this equation is to be used for. If it not intended to be used for both approaches, please include information regarding calculation for each individual approach.<br><br>NCR: Please define the parameters used in this equation. |
| **Round 1 Response from Methodology Developer** | Table 2 makes clear that non-woody biomass is excluded from the accounting boundary for the census-based approach, so this only applies to the area-based approach. Also, parameter DM_WP-herb now has a parameter table providing guidance on how herbaceous biomass is determined. |
| **Aster Global Findings - Round 2** | The assessment team notes that it has been made clear that this equation is only for use under the area-basis, and that the parameters used in its calculation are not defined in the methodology, including methods for determination of herbaceous biomass. This finding is closed. |

| **Item Number** | 98 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 13 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear if this equation is supposed to be used for the area based, census based, or both approaches.<br><br>At, is defined as "area (per stratum, e.g. if the project harvests only a portion of the project area) in year t; ha." This definition is inconsistent with At as defined in the parameters section. It is unclear how this is appropriate.<br><br>The equation as written is mathematically incorrect, as the resulting units are not in line with computation prescribed.<br><br>The assessment team noted that the solution to the equation is noted as DCWP-HWP,t in the description of relevant parameters, however in the actual equation it is noted as ΔCWP-HWp,t. It is unclear to the assessment team what the proper notation is. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | This equation has been removed from the methodology as harvested wood products have been dropped. Item closed. |

| Item Number | 99 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq 14 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Round 1 Findings | It is unclear to the assessment team what the CF parameter in this equation is supposed to be, as the subscript is denoted as blank box and CF is defined in multiple ways throughout the methodology.<br><br>Additionally parameter ty in the "where" section is not defined by the methodology.<br><br>It is unclear, as written, how the application of j is undefined outside of this equation, further it is unclear how scale tickets that do not break out to an individual tree species would be correctly applied using this equation. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| Aster Global Findings - Round 2 | This equation has been removed from the methodology as harvested wood products have been dropped. Item closed. |

| Item Number | 100 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq 15 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Round 1 Findings | The solution to this equation is denoted as CWP,t however, in the "where" section, the solution is denoted as CWP-HWPt. It is unclear to the assessment team which notation is correct.<br><br>Additionally, it is unclear what the top portion of the summation is supposed to be and how the mathematics presented result in the final product. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |

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| **Aster Global Findings - Round 2** | This equation has been removed from the methodology as harvested wood products have been dropped. Item closed. |

| **Item Number** | 101 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 16 (ΔCWP-DW,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how the potential for stratification in the project is accounted for in this equation.<br><br>At, is defined as "area (per stratum, e.g. if the project harvests only a portion of the project area) in year t; ha." This definition is inconsistent with At as defined in the parameters section. It is unclear how this is appropriate. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | References to strata in equations have been removed - see response to finding #85 |
| **Aster Global Findings - Round 2** | This finding is no longer relevant as harvested wood products have been dropped. Item closed. |

| **Item Number** | 102 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 17 (CWP-DW,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how the solution to this equation represents the mean carbon stock of dead wood in year t. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the solution to this equation is the mean carbon stock of dead wood in year t. |
| **Round 1 Response from Methodology Developer** | The equation does not calculate an average - raw parameter definitions and parameter tables have been updated to specify that they are average values (clarifications have been made throughout that all parameters expressed in units of per hectare or per planting unit are averages). The only equation provided to calculate an average value is eq 11, which produces an average woody stock per planting unit - this equation was included because using individual trees as sample units is a novel approach and may not be readily interpreted by methodology users. |

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| **Aster Global Findings - Round 2** | The assessment team acknowledges that the equation does not calculate an average but is the sum of two averages. However, the parameters Bwp-sdw,t and Bwp-LDW are not listed in Data and Parameters.<br>Further, CWP-DW,t is not defined in "where" and CWP_DW,t is defined in "where" but not included in the equation. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | The equation is a sum of averages, but still represents an average estimate per unit area. Under where, underscore changed to hyphen. Bwp-sdw,t and Bwp-LDW corrected to BSDW,t and BLDW,t (now consistent with parameter tables). |
| **Aster Global Findings - Round 3** | The revisions made have addressed the finding. |

| **Item Number** | 103 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 18 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | In the "where" section of this equation, parameter CWP-SDW,i,t is defined twice, with different definitions for each parameter. It is unclear how this is appropriate. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | This is now corrected. Single parameter definition now reads "Carbon stock in standing dead wood in cohort i in the project scenario in year t; t C" |
| **Aster Global Findings - Round 2** | It appears that this Equation has been struck from the methodology, further substantiated by the fact the Table 2 now clarifies that that dead wood is excluded if using the census base approach. However, the methodology developer response implies that the equation has been revised rather than removed. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify whether this equation has been removed from the methodology. |
| **Round 2 Response from Methodology Developer** | The equation has been removed. |
| **Aster Global Findings - Round 3** | The clarification provided is sufficient to close the identified finding. Item closed. |

| **Item Number** | 104 |
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|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq 19 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Round 1 Findings | Multiple parameters in the "where" section for this equation are undefined.<br><br>Additionally, see finding pertaining to appropriateness of sampling as it pertains to maintenance of a full census. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | All equation parameters are defined for eq 19. Note that a complete census is not maintained. Only the initial census, Ni, is taken, which is then adjusted for mortality during the course of monitoring. The description in the parameter table specifies Ni as "*Initial* population size of cohort i" |
| Aster Global Findings - Round 2 | It appears that this Equation has been struck from the methodology, further substantiated by the fact the Table 2 now clarifies that that dead wood is excluded if using the census base approach. However, the methodology developer response implies that the equation has been revised rather than removed. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please clarify whether this equation has been removed from the methodology. |
| Round 2 Response from Methodology Developer | The equation has been removed. |
| Aster Global Findings - Round 3 | The clarification provided is sufficient to close the identified finding. Item closed. |

| Item Number | 104.1 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq 17 (ΔCWP-Soil,t) |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Findings - Round 2 | ΔCWP-Soil,t is not used in any subsequent equation. However, a similar parameter, ΔCWP-SOC,t is used downstream (e.g., Eq 1). The description of Cwp-SOIL,t in the where section does not match the description in Data and Parameters. |

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| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure consistent use of parameters. CL: Please ensure consistent descriptions of parameters both within "where" sections of Equations and with Data and Parameters. |
| **Round 2 Response from Methodology Developer** | ΔCWP-Soil,t and CWP-Soil,t changed to ΔCWP-SOC,t and CWP-SOC,t. Now consistent throughout. Description under where of this equation matches parameter table for CWP-Soil,t. |
| **Aster Global Findings - Round 3** | The revision now uses the same parameter ΔCWP-SOC,t rather than mixing ΔCWP-SOC,t and ΔCWP-Soil,t. This finding is closed. |

| **Item Number** | 105 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 24 (GHGWP-bburn,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the equation and noted that the computation contains the inverse ratio 12/44. It is unclear how this is appropriate as inputs to the equation are already in Tonnes of d.m/hectare.<br><br>It was also noted that the summation notation is mathematically incorrect as written.<br><br>Additionally, it is unclear how potential stratification is accounted for in this equation.<br><br>Additionally the dimensional analysis of the equation as presented is incorrect based on the location of the summation notation. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings and address as appropriate or present evidence to substantiate the computational approach. |
| **Round 1 Response from Methodology Developer** | The term 12/44 has been deleted (GWP already converts to tCO2 equivalent). Summation term is readily understandable and matches VM7 equation. References to stratification have been deleted. |
| **Aster Global Findings - Round 2** | Given the placement of parentheses, the summation notation remains mathematically incorrect as written. G is undefined in "where" BWP,t is inconsistently described in "where" throughout manuscript. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Equation structure matches E-BB biomass burning module of VM7. The same procedure is applied for each gas "1" through "G" (which are defined as methane and nitrous oxide, but for simplicity in equation subscripts and summation term referenced as 1 through G. The two gases are then summed. "G" is defined under "g", as 1 ... G greenhouse gases (methane and nitrous oxide). BWP now consistently defined throughout. |

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| **Aster Global Findings - Round 3** | Revisions to this equation (now #15) fix the issue raised in this finding. |

| **Item Number** | 106 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 25 (BWP,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the equation and noted that the computation of a 0.5 carbon fraction does not yield dry matter for all input components. It is unclear how this is appropriate. |
| **Round 1 NCR/CL/OFI** | CL: Please correct the equation in line with appropriate quantification methods, or justify the appropriateness of the equation as written. |
| **Round 1 Response from Methodology Developer** | Equation corrected to apply carbon fraction of litter to litter. |
| **Aster Global Findings - Round 2** | CFLI is inconsistently described in "where" throughout manuscript. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure consistent descriptions of parameters both within "where" sections of Equations and with Data and Parameters. |
| **Round 2 Response from Methodology Developer** | CF_LI dropped. See response to finding 123 |
| **Aster Global Findings - Round 3** | The assessment team confirmed the parameter in question, CF_LI, has been removed, voiding this finding. |

| **Item Number** | 107 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 26 (GHGWP-bburn,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the equation and noted that the computation contains the inverse ratio 12/44. It is unclear how this is appropriate as inputs to the equation are already in Tonnes of d.m/hectare.<br><br>It was also noted that the summation notation is mathematically incorrect as written. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings and address as appropriate or present evidence to substantiate the computational approach. |

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| **Round 1 Response from Methodology Developer** | The term 12/44 has been deleted (GWP already converts to tCO2 equivalent). Summation term is readily understandable and matches VM7 equation. |
| **Aster Global Findings - Round 2** | 12/44 remains defined in "where" but is not in equation. G is undefined in "where" |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | 12/44 deleted under where. "G" is defined under "g", as 1 … G greenhouse gases (methane and nitrous oxide). See response to finding #105 |
| **Aster Global Findings - Round 3** | The Methodology developer has made appropriate changes in the Methodology and sufficiently clarified the term G. This finding is closed. |

| **Item Number** | 108 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 27 (BWP,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | Multiple parameters in the "where" section for this equation are undefined. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | All component parameters are defined |
| **Aster Global Findings - Round 2** | Assessment team notes that all parameters are now defined. This finding is closed. |

| **Item Number** | 109 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 28 (GHGWP-N20,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to this equation. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |

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| **Round 1 Response from Methodology Developer** | CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application |
| **Aster Global Findings - Round 2** | Pending response to MWP,SF,I,t and MWP,OF,I,t |
| **Aster Global Findings - Round 3** | As there is no longer an areal component in the construction of this equation, this finding is no longer pending and is closed. |

| **Item Number** | 110 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 29: Co2eNdirect,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to these equations.<br><br>The assessment team noted that the term "I" appears on the right side, but does not appear on the left side. It is unclear why "I" is not on the left side of the equation.<br><br>Furthermore, it is unclear to the assessment team what the term "I" is as it pertains to this equation. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application. All subscripts "i" deleted. |
| **Aster Global Findings - Round 2** | 44/18 is undefined in "where" |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure all terms in equations are defined. |
| **Round 2 Response from Methodology Developer** | 44/28 now defined as (44/28) Ratio of molecular weight of N20 to molecular weight of N (applied to convert N20-N emissions to N20 emissions); unitless |
| **Aster Global Findings - Round 3** | The Methodology Developer has added a definition for 44/28; however the definition is not properly aligned. |
| **Round 3: NCR/CL/OFI** | CL: Ensure all text (e.g. paragraphs, Equation numbering, listing of parameter definitions in "Where:" are properly formatted. |
| **Round 3 Response from Methodology Developer** | Formatting for 44/28 corrected. Note that final formatting to be completed following resolution of all technical findings. |
| **Aster Global Findings - Round 4** | Text still contains similar formatting issues in the "where:" sections of equations, e.g., Eq 2. Methodology Developer states this will be addressed following resolution of all technical findings.<br><br>Closure of this item is pending formatting in the penultimate version of the document. |

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| **Aster Global Findings - Round 5** | This finding is closed and placed with a generic requirement in the Method Template checklist. |

| **Item Number** | 111 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 29: Fwp,SF,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to these equations.<br><br>The assessment team noted that the term "I" appears on the right side, but does not appear on the left side. It is unclear why "I" is not on the left side of the equation.<br><br>Furthermore, it is unclear to the assessment team what the term "I" is as it pertains to this equation.<br><br>It is unclear how this equation could be applied for multiple fertilizers of different chemical makeup. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application. All subscripts "i" deleted. Different fertilizer contents are incorporated in the calculations with different values applied for NCsf and NCof. For simplicity, the calculations are laid out for organic and synthetic fertilizers each of a single chemical makeup. |
| **Aster Global Findings - Round 2** | Pending response to MWP,SF,I,t and MWP,OF,I,t |
| **Aster Global Findings - Round 3** | As there is no longer an areal component in the construction of this equation, this finding is no longer pending and is closed. |

| **Item Number** | 112 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 29: Fwp, ON,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |

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| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to these equations.<br><br>The assessment team noted that the term "I" appears on the right side, but does not appear on the left side. It is unclear why "I" is not on the left side of the equation.<br><br>Furthermore, it is unclear to the assessment team what the term "I" is as it pertains to this equation.<br><br>It is unclear how this equation could be applied for multiple fertilizers of different chemical makeup. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application. All subscripts "i" deleted. Different fertilizer contents are incorporated in the calculations with different values applied for NCsf and NCof. For simplicity, the calculations are laid out for organic and synthetic fertilizers each of a single chemical makeup. |
| **Aster Global Findings - Round 2** | Pending response to MWP,SF,I,t and MWP,OF,I,t |
| **Aster Global Findings - Round 3** | As there is no longer an areal component in the construction of this equation, this finding is no longer pending and is closed. |

| **Item Number** | 113 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 30: CO2eNindirect,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to these equations.<br><br>The assessment team noted that the term "I" appears on the right side, but does not appear on the left side. It is unclear why "I" is not on the left side of the equation.<br><br>Furthermore, it is unclear to the assessment team what the term "I" is as it pertains to this equation. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application. All subscripts "i" deleted. |
| **Aster Global Findings - Round 2** | Pending response to MWP,SF,I,t and MWP,OF,I,t |

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| **Aster Global Findings - Round 3** | As there is no longer an areal component in the construction of this equation, this finding is no longer pending and is closed. |

| **Item Number** | 114 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 30: Nfertwp,volat,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to these equations.<br><br>The assessment team noted that the term "I" appears on the right side, but does not appear on the left side. It is unclear why "I" is not on the left side of the equation.<br><br>Furthermore, it is unclear to the assessment team what the term "I" is as it pertains to this equation. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application. All subscripts "i" deleted. |
| **Aster Global Findings - Round 2** | 44/18 is undefined in "where" |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure all terms in equations are defined. |
| **Round 2 Response from Methodology Developer** | 44/28 now defined as (44/28) Ratio of molecular weight of N2O to molecular weight of N (applied to convert N2O-N emissions to N2O emissions); unitless |
| **Aster Global Findings - Round 3** | The Methodology Developer has added a definition for 44/28; however the definition is not properly aligned. |
| **Round 3: NCR/CL/OFI** | CL: Ensure all text (e.g. paragraphs, Equation numbering, listing of parameter definitions in "Where:" are properly formatted. |
| **Round 3 Response from Methodology Developer** | Formatting for 44/28 corrected. Note that final formatting to be completed following resolution of all technical findings. |
| **Aster Global Findings - Round 4** | Pending closure of above Finding: Eq 29: Co2eNdirect 23a |
| **Aster Global Findings - Round 5** | This finding is closed as it is duplicate of another. |

| **Item Number** | 115 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 30: N fertwp, leach,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why there is an areal component to these equations.<br><br>The assessment team noted that the term "I" appears on the right side, but does not appear on the left side. It is unclear why "I" is not on the left side of the equation.<br><br>Furthermore, it is unclear to the assessment team what the term "I" is as it pertains to this equation.<br><br>The methodology states "Indirect nitrous oxide emissions produced from leaching and runoff of N, in regions where leaching and runoff occurs, due to nitrogen fertilizer use in year t; t CO2e per ha. Value = 0 where average annual precipitation is less than potential evapotranspiration unless subject to irrigation." Please justify the appropriateness of this statement.<br><br>Furthermore, it is unclear where the computation for the computation for potential evapotranspiration occurs within the methodology in order assess whether or not this value should be treated as zero. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Note that the construction of this eq is the same as eq 18 in validated methodology VM42. CO2e emissions from N are expressed per ha, which are then multiplied by the area subject to fertilizer application. All subscripts "i" deleted. Text "Value = 0 where average annual precipitation is less than potential evapotranspiration unless subject to irrigation" deleted. |
| **Aster Global Findings - Round 2** | 44/18 is undefined in "where" |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure all terms in equations are defined. |
| **Round 2 Response from Methodology Developer** | 44/28 now defined as (44/28) Ratio of molecular weight of N20 to molecular weight of N (applied to convert N20-N emissions to N20 emissions); unitless |
| **Aster Global Findings - Round 3** | The closure of this finding is pending the finding immediately above (re: Equation for Nfertwp,volat,I,t) |
| **Aster Global Findings - Round 5** | This finding is closed as it is duplicate of another. |

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| **Item Number** | 116 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 31 UNCt |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear for why the divisor of the equation is the carbon stock change when the input for the upper component is the carbon stock.<br><br>It is unclear why uncertainty for the baseline performance benchmark is assumed to have zero uncertainty.<br><br>Uncertainty is based on a 95 percent confidence interval, however the requirement is for a 90 percent interval. It is unclear why this approach was taken. Similarly, it is noted that a 15 percent window is applied. It is unclear how that is in line with the 10 in the requirements. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Uncertainty is now framed around the 90% confidence interval, with a 10% threshold applied. Equation has been expanded to assess uncertainty in stock change, propagating errors around stock estimates at time t and time t=0. Uncertainty in the performance benchmark is not addressed here, but in Appendix A treatment has been expanded to assess significance in difference of trends applying a Z test (which results in a performance benchmark of -100% where there is no significant difference between project and control stocking index increments. |
| **Aster Global Findings - Round 2** | Up is in Eq 26a but undefined in "where". Up,t is defined in "where" but not in Equation 26a.<br>The definition of T does not define where one is to source degrees of freedom.<br>N appears in Equation 26b but is undefined in "where". Nt appears in "where" but is not used in Equation 26b. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Subscripts of Up and n corrected and now consistent in eq and under where. Degrees of freedom are dependent on sample design and unspecified. This is consistent with eq. 13 of VM45. |
| **Aster Global Findings - Round 3** | The Methodology developer has made appropriate changes in the Methodology and sufficiently clarified the sourcing of degrees of freedom for parameter T.<br>This finding is closed. |

| **Item Number** | 117 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 32 UNCt |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear for why the divisor of the equation is the carbon stock change when the input for the upper component is the carbon stock.<br><br>Uncertainty is based on a 95 percent confidence interval, however the requirement is for a 90 percent interval. It is unclear why this approach was taken. Similarly, it is noted that a 15 percent window is applied. It is unclear how that is in line with the 10 in the requirements. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | For the census-based approach, measured stock = stock change because it's starting from zero (absence of tree). Uncertainty is now framed around the 90% confidence interval, with a 10% threshold applied. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to address this finding. Item closed. |

| **Item Number** | 118 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 33 NGRt |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how the computation as performed is appropriate for the computation of baseline harvested wood products. For example, if trees are being harvested and retained in baseline with harvested wood products how is that incorporated into computations as presented. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | ΔCWP,t-1 appears in the equation but is undefined in "where" UNCt-1 appears in the equation but is undefined in "where" ΔCWP appears in "where" but does not appear in the equation.<br><br>Because there is no text description associated with this equation, it is unclear, at what frequency NGRt is to be calculated. As implied by the unit of t (years), it appears ΔCWP, and UNC are to be calculated annually, rather than periodically, to determine NGR. |

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| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure all terms in equations are defined and that all defined terms are included in equations.<br>OFI: Please add text description to make it clear to Methodology users how to determine the frequency of NGR. In particular, address how to determine values between measurement periods (e.g., in the text description of Eq 34 of VM0042). |
| **Round 2 Response from Methodology Developer** | Under where, t subscript added to ΔCWP. As in response to finding #96, ΔCWP,t-1 and UNCt-1 are implicitly defined under "where" as the respective parameters with subscript t (t value need not be specified in definition under where to be understood). Guidance to annualize periodic values is now provided (see response to finding #91). |
| **Aster Global Findings - Round 3** | The revisions made have addressed the finding. |

| **Item Number** | 119 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Eq 34 NGRt |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how a baseline scenario of zero is appropriate in all cases. For example, if project area could potentially grow plants or is not bare ground, the assumption could be potentially erroneous. Additionally, it is unclear how the equation as written is appropriate as the baseline is not incorporated into the computation of the equation. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | See response to finding #42. The baseline value of zero is implicit in the equation. We have added the constraint: "The project activity must take place within an area with pre-existing tree canopy cover < 30% and/or subject to continuous cropping or in a settlements or other lands land use category" to specify conditions where a zero baseline is valid (i.e. areas otherwise unlikely to support tree establishment - non-forest, working lands). |
| **Aster Global Findings - Round 2** | It is still unclear whether a baseline of 0 is appropriate. E.g. if tree plantings in a shrub field lead to replacement of carbon stocks from trees to shrubs, as opposed to additions, how would the census-basis capture this? |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Requisite consdition for census-based approach in Table 1 now revised to "The project activity must take place within an area with pre-existing tree canopy tree and/or shrub cover < 10% " and "vegetative cover" revised to "tree and/or shrub cover" consistently. |
| **Aster Global Findings - Round 3** | The more conservative applicability condition provided in the revision ("The project activity must take place within an area with pre-existing woody biomass cover < 10% ...") satisfies this findings. |

| Item Number | 120 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Appendix A<br>All equations |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A |
| Aster Global Round 1 Findings | It is unclear how the equations identified in Appendix A would allow project proponents to appropriately derive the Performance Benchmark. The assessment team noted that multiple steps do not include their own respective equations. |
| Round 1 NCR/CL/OFI | CL: Please include all relevant equations and steps needed to ensure the process for deriving the Performance Benchmark is clear and easily followable. |
| Round 1 Response from Methodology Developer | Appendix B has been reorganized and laid out in clear sequential steps. Essential equations are provided, and level of detail matches similar appendix in VM45. |
| Aster Global Findings - Round 2 | Methodology Developer responded with references to Appendix B, however this finding is in regards to Appendix A. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please include all relevant equations and steps needed to ensure the process for deriving the Performance Benchmark is clear and easily followable. |
| Round 2 Response from Methodology Developer | Appendix A has been reorganized and laid out in clear sequential steps. Essential equations are provided, and level of detail matches similar appendix in VM45. |
| Aster Global Findings - Round 3 | The revisions made have addressed the finding. |

| Item Number | 120.1 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq A2 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A |
| Aster Global Findings - Round 2 | SDM is undefined in "where" |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please ensure all terms in equations are defined and that all defined terms are included in equations. |
| Round 2 Response from Methodology Developer | SDM now defined under "where" |
| Aster Global Findings - Round 3 | The assessment team confirms Eq. A2 now defines SDM under "Where:". This finding is closed. |

| Item Number | 120.2 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq A3 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A |
| Aster Global Findings - Round 2 | Equation uses asterisks to denote multiplication rather than "x" |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please ensure consistent notation of mathematical operators. |
| Round 2 Response from Methodology Developer | throughout the methodology, all "x" have been changed to "*" to denote multiplication |
| Aster Global Findings - Round 3 | The methodology now includes consistent notation of mathematical operators.<br>This finding is closed. |

| Item Number | 120.3 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq A4 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A |
| Aster Global Findings - Round 2 | nt is used in this equation as "Number of remotely-sensed project plots and matched control plots (i) with values assessed at time t" but nt has already been reserved as "Number of planting units sampled in year t". |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please ensure no parameters are duplicated. |
| Round 2 Response from Methodology Developer | nt in equations A3 and A4 now changed to n_rs,t |
| Aster Global Findings - Round 3 | The methodology has consisently changed the duplicative parameter nt to n_rs,t.<br>This finding is closed. |

| Item Number | 120.4 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Eq A5 |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A |
| **Aster Global Findings - Round 2** | SE^2ΔSI_wp,t and SE^2ΔSI_control,t are defined as standard errors in the "where" section, but mathematically these are the square of standard errors. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please correct the definition of SE^2ΔSI_wp,t and SE^2ΔSI_control,t. |
| **Round 2 Response from Methodology Developer** | Definitions changed to squared standard errors |
| **Aster Global Findings - Round 3** | The methodology now defines SE^2ΔSI_wp,t and SE^2ΔSI_control,t correctly.<br>This finding is closed. |

| **Item Number** | 121 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | At |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The Data/Parameter table describes “At” as "Project area in year t." However, the description also mentions stratum area in equations 7, 11, 13, 17, 21, and 24. The description in the Data/Parameter table is not clear and does not correspond to what is described in the equations. Also, it is not clear to the assessment team why "Equations" section of “At” in the table is left blank. This also applies for other Data/Parameters.<br><br>The assessment team noted in the Comments section that stratification may be carried out when the project area is not homogeneous. Additionally, the assessment team noted different stratifications may be used for the baseline and project scenarios. However, it is unclear to the assessment team on what basis of the variables the strata may be defined. There is no mention of any method on stratifying the project area.<br><br>It is unclear how the description "Project area in year t" is appropriate, as this is a parameter available at validation. Additionally, parameter At is included as a monitored parameter with the same description.<br><br>Additionally, the assessment team noted in the comments section “Stratification must be employed if even-aged harvesting is planned to occur on a part of the project area. In this case, the procedures for LA and LC (in Equations 40 and 41, respectively) only apply to the strata subject to even-aged harvesting”. It is unclear to the assessment team how this statement is appropriate because the methodology makes no mention of harvesting, LA, or LC. In addition, equations 40 and 41 do not appear in the methodology. |

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| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the findings and add additional description as required for "At". Provide additional guidance on stratification. Additionally, make corrections in line with the findings as necessary. |
| **Round 1 Response from Methodology Developer** | Reference to stratification has been deleted (see response to finding #85). Agree that At is confusing - has been revised in all eqs and parameter table to A (with no t subscript). |
| **Aster Global Findings - Round 2** | At is still used in Equation 14 as well as the text preceding Eq 25. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure Parameter At has been changed to A throughout Methodology. |
| **Round 2 Response from Methodology Developer** | At changed to A in the flagged instances |
| **Aster Global Findings - Round 3** | The assessment team finds no more instances of At in the methodology. This finding is closed. |

| **Item Number** | 122 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Rj |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | This parameter is defined as Rj. However, in equations that utilize this parameter, the notation is R. It is unclear what the "j" is in this parameter, as it is not defined or used in applicable equations.<br><br>The description for this parameter states that this parameter is applied as belowground biomass per hectare: aboveground biomass per hectare (not on a per stem basis). It is unclear how this is appropriate for the census based approach as written, given there is no areal component.<br><br>The methodology states:" (a) Detailed data collected using common practices for root sampling in the area;" it is unclear how the methodology as presented ensures professionally acceptable approaches be applied. Further, detail is insufficient to ensure consistent methodology application and ensure root sampling data are appropriate.<br><br>The comments for choice of default values are the justification of choice of data or description of measurement and should be moved to the appropriate section.<br><br>It is unclear how the purpose of data being listed as "calculation of baseline emissions" is appropriate. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |

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| **Round 1 Response from Methodology Developer** | "j" subscript removed. The parameter table for R has been completely updated to address the finding. R may be expressed as per unit area or per stem. |
| **Aster Global Findings - Round 2** | In data and parameters, R is defined as unitless but, within the text, R is defined as tonnes of root [undefined] over tonnes of shoot dry matter In addition, R is inconsistently described throughout text and in Data and Parameters. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify the units of tonnes of root. CL: Please ensure consistency of unit definitions. CL: Please ensure consistent descriptions of parameters. |
| **Round 2 Response from Methodology Developer** | R now consistently defined as root:shoot ratio, and in units of t root dm (t-1 t shoot dm -1). |
| **Aster Global Findings - Round 3** | The description of R throughout the methodology is now consistently used and has all necessary elements in its description. This finding is closed. |

| **Item Number** | 123 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | CF |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | CF is defined as the carbon fraction of dry matter in the Parameters Table, with a default value of 0.47. The source of this data is noted as "IPCC" default value. It is unclear to the assessment team which IPCC publication is being referenced.<br><br>CF is denoted as described in the Parameters table for Equations 17 and 19. However, in Equations 12 and 14 it is denoted as the "carbon fraction of biomass." In Equation 12 it is denoted as CFHerb, and in Equation 14 it is denoted as CF, with a blank box in subscript. It is unclear if the values to be used in these equations are the same as that identified in the Parameters table (0.47).<br><br>In Equation 25 the parameter CF has a defined value of 0.5, which is not consistent with the value identified in the Parameter table. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify which IPCC publication this value is referenced from. NCR: Multiple values and multiple descriptions of this parameter inconsistent with what is identified in the Parameters Table are used in equations throughout the methodology. Please update the values and descriptions in Equations throughout the methodology to be consistent with what is identified in the Parameters table, or include additional parameters. |
| **Round 1 Response from Methodology Developer** | Parameter tables and equation explanations revised to clarify. There are two CFs employed, with sources specified, CF and CF for litter (CF_herb deleted). |

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| **Aster Global Findings - Round 2** | The current methodology uses 0.47 for CF to represent the carbon fractions in dead wood, living trees and herbaceous pools, using Table 4.3 of Vol 4 of the 2006 IPCC Guidelines for Natl GHG Inventories. This value is based on McGroddy et al. 2004 and explicitly includes litter (i.e.,0.47 is inclusive of all pools combined). However, Vol 2 of the 2006 IPCC Guidelines for Natl GHG Inventories, and the IPCC GPG for LULUCF disaggregate carbon fractions by pool, using 0.50 for all pools, except for litter which is assigned a fraction of 0.37.<br>Given that this methodology's equations disaggregates carbon fraction per each carbon pool, it is unclear why the methodology assigns a carbon fraction of 0.47, intended for pooling over all pools. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify how the selected values of carbon fraction were chosen. |
| **Round 2 Response from Methodology Developer** | CF_LI dropped. A single CF value of 0.47 is used for all pools. |
| **Aster Global Findings - Round 3** | In assessing whether 0.47 or 0.50 was most appropriate to use as a single carbon fraction to use for all pools, the assessment team surveyed a sample of Verra approved methodologies and modules to identify a working standard. The team found five methodologies (VM003,VM005,VM045, VM005, and VM010) using a value of 0.50 and one methodology (VM0029) and two modules (VMD0012, VMD0013) used a default value of 0.47. Consequently, there is no unanimous standard value, and the assessment team closes this CL.<br><br>However, in the assessment team's survey, the team found that it was commonplace to permit, or require, the use of species-specific carbon fraction values where such values are published in authoritative sources. |
| **Round 3: NCR/CL/OFI** | OFI: Consider permitting users to apply species-specific carbon fractions. |
| **Round 3 Response from Methodology Developer** | OFI noted. |
| **Aster Global Findings - Round 4** | Methodology Developer noted OFI, making no changes. This finding is closed. |

| **Item Number** | 124 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Dj |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |

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| **Aster Global Round 1 Findings** | The parameter Vex,ty,j,t assumes bark on volume in cubic meters. The methodology as presented does not require bark on wood densities be applied. The audit team notes that commonly wood densities are for solid wood and not accounting for bark and thus it is unclear how the conversion factor as applied is appropriate.<br><br>The methodology states " If no species-specific values for Dj are available, the average value across all species can be used, increased by 20% to ensure conservative estimates in the baseline, or decreased by 20% to ensure conservative estimates in the project scenario." It is unclear to the assessment team where this approach is sourced from and how it is justified. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the referenced approach is appropriate, and cite evidence to substantiate it. |
| **Round 1 Response from Methodology Developer** | Parameter Vex eliminated (along with harvest wood products calculations) |
| **Aster Global Findings - Round 2** | It is unclear why Dj remains in the Data and Parameters |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify what equation the parameter Dj is used in |
| **Round 2 Response from Methodology Developer** | Parameter Dj removed |
| **Aster Global Findings - Round 3** | The assessment team confirms that Dj has been wholly stricken from the current version of the Methodology. This finding is closed. |

| **Item Number** | 125 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | EFN20,burn |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The source of data for this parameter states "The project proponent may use factors that have been determined for grassland vegetation. A suitable EFN20 value is 0.21 from Table 2.5 of the 2006 IPCC Guidelines for National Greenhouse Inventories."<br><br>There is a typo in the title of the referenced IPCC report. The value for the parameter is listed as N/A. It is unclear how this is appropriate as a value is referenced in the source of data. Further it is unclear what other values would be allowable, and if the listed value is the preferred value to be applied.<br><br>Additionally, the justification of choice… section states that N20 emissions from herbaceous wetland vegetation are not currently available but expected to be similar to those for grassland vegetation. No evidence to support this claim has been provided. |

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| Round 1 NCR/CL/OFI | CL: Please fix the typo referencing the IPCC report.<br>CL: Please clarify the value to be used for this parameter.<br>CL: Please provide evidence supporting the claim made regarding herbaceous wetland vegetation N20 emissions being similar to grassland vegetation |
| Round 1 Response from Methodology Developer | The typo has been corrected and value applied as "N/A" deleted. The statement "N20 emissions from herbaceous wetland vegetation are not currently available but expected to be similar to those for grassland vegetation" has been removed - equally, we have no information to assume otherwise. A single value is now referenced. |
| Aster Global Findings - Round 2 | It is unclear what equation EFN20,burn is used in. The assessment team assumes this was intended for Equation 18 but it is redundant with Efg.<br><br>It is unclear why Parameters like COMF and EFg are project and ecosystem specific but a single value of EFN20,burn (based on grasslands/savannah in Table 2.5 of the 2006 IPCC Guidelines for National Greenhouse Inventories) is selected. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please clarify what equation EFN20,burn is used for.<br><br>CL: Please clarify the value to be used for this parameter. |
| Round 2 Response from Methodology Developer | EFN20,burn parameter table removed (not used in eqs). This also eliminates the note discrepancy in selection of value between COMF and EFg and EFN20,burn. |
| Aster Global Findings - Round 3 | The developer confirmed parameter EFN20 was superfluous, nullifying this finding. |

| Item Number | 126 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | EFCH4,burn |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | The source of data for this parameter states "The project proponent may use factors that have been determined for grassland vegetation. A suitable EFCH4 value is 2.3, from Table 2.5 of the 2006 IPCC Guidelines for National Greenhouse Inventories."<br><br>There is a typo in the title of the referenced IPCC report. The value for the parameter is listed as N/A. It is unclear how this is appropriate as a value is referenced in the source of data. Further, it is unclear what other values would be allowable, and if the listed value is the preferred value to be applied. |
| Round 1 NCR/CL/OFI | CL: Please fix the typo referencing the IPCC report.<br>CL: Please clarify the value to be used for this parameter. |
| Round 1 Response from Methodology Developer | The typo has been corrected and value applied as "N/A" deleted. A single value is now referenced. |

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| **Aster Global Findings - Round 2** | It is unclear what equation EFCH4,burn is used in. The Audit team assumes this was intended for Equation 18 but it is redundant with Efg.<br><br>It is unclear why Parameters like COMF and EFg are project and ecosystem specific but a single value of EFCH4,burn (based on grasslands/savannah in Table 2.5 of the 2006 IPCC Guidelines for National Greenhouse Inventories) is selected. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify what equation EFCH4,burn is used for.<br><br>CL: Please clarify the value to be used for this parameter. |
| **Round 2 Response from Methodology Developer** | EFCH4,burn parameter table removed (not used in eqs). This also eliminates the note discrepancy in selection of value between COMF and EFg and EFCH4,burn. |
| **Aster Global Findings - Round 3** | The developer confirmed parameter EFCH4 was superfluous, nullifying this finding. |

| **Item Number** | 127 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Ni |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | Parameter Ni is defined as the number of planting units in cohort I. Cohort I is not itself defined as a parameter.<br><br>The comments are directly in contrast to the value applied field and Table 1 of the methodology. It is unclear how this is appropriate.<br><br>This item is also pending related findings in the "non-checklist" section. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Ni corrected to N. Cohorts subscript "I" now removed (consistent with removal of strata subscripts). |
| **Aster Global Findings - Round 2** | The audit team confirmed the subscript "I" and application of stratification in equations no longer appears. Item closed. |

| **Item Number** | 127.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | GWPCH4 |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Findings - Round 2** | It is unclear what equation GWPCH4 is used in; if intended for Eq 18, this parameter is redundant with GWPg. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify what equation GWPCH4 is intended to be used in. |
| **Round 2 Response from Methodology Developer** | GWPCH4 parameter table removed (not needed - eqs reference GWPg) |
| **Aster Global Findings - Round 3** | The developer confirmed parameter GWPCH4 was superfluous, nullifying this finding. |

| **Item Number** | 127.2 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | GWPN20 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Findings - Round 2** | GWPN20 is described differently in the Data and Parameters table than in text. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure consistent descriptions of parameters |
| **Round 2 Response from Methodology Developer** | GWPN20 revised to GWPg |
| **Aster Global Findings - Round 3** | The developer confirmed parameter GWPN20 was superfluous, nullifying this finding. |

| **Item Number** | 128 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Cf |
| **Aster Global Round 1 Findings** | It is unclear what this parameter refers to. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify what parameter this relates to. |
| **Round 1 Response from Methodology Developer** | "Cf" revised to COMF |
| **Aster Global Findings - Round 2** | The assessment team found this parameter has been struck from the most recent version. Item closed. |

| Item Number | 129 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | EFg |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | Parameter EFg is defined twice in Section 9.1. One parameter is in g kg-1 dry matter burn and the other in kg t-1 dry matter burnt. It is unclear why two parameters with the same name but different data units are used.<br><br>Additionally, it is unclear which parameter is to be used in equations. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | Superfluous parameter table eliminated. EFg expressed in units of kg/t dm |
| Aster Global Findings - Round 2 | The audit team found the duplication of this parameter has been struck from the most recent version. Item closed. |

| Item Number | 130 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | FRACGASF |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | The assessment team reviewed the referenced table in the IPCC 2019 Refinement to the IPCC which lists the default value for FRACGASF as 0.11. It is unclear why the value applied is 0.1 |
| Round 1 NCR/CL/OFI | CL: Please clarify the inconsistency between the referenced table value and the value to be applied. |
| Round 1 Response from Methodology Developer | Value of 0.1 corrected to 0.11 |
| Aster Global Findings - Round 2 | The correct value is now listed for FRACGASF. Item closed. |

| Item Number | 131 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | FRACGASM |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the referenced table in the IPCC 2019 Refinement to the IPCC which lists the default value for FRACGASM as 0.21. It is unclear why the value applied is 0.3 |
| **Round 1 NCR/CL/OFI** | CL: Please clarify the inconsistency between the referenced table value and the value to be applied. |
| **Round 1 Response from Methodology Developer** | Value of 0.3 corrected to 0.21 |
| **Aster Global Findings - Round 2** | The correct value is now listed for FRACGASM. Item closed. |

| **Item Number** | 132 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | FRACLEACH |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the referenced table in the IPCC 2019 Refinement to the IPCC which lists the default value for FRACGASM as 0.24. It is unclear why the value applied is 0.3 |
| **Round 1 NCR/CL/OFI** | CL: Please clarify the inconsistency between the referenced table value and the value to be applied. |
| **Round 1 Response from Methodology Developer** | Value of 0.3 corrected to 0.24 |
| **Aster Global Findings - Round 2** | The correct value is now listed for FRACLEACH. Item closed. |

| **Item Number** | 133 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | EFNleach |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the referenced table in the IPCC 2019 Refinement to the IPCC which lists the default value for EFNleach as 0.011. It is unclear why the value applied is 0.075 |
| **Round 1 NCR/CL/OFI** | CL: Please clarify the inconsistency between the referenced table value and the value to be applied. |
| **Round 1 Response from Methodology Developer** | Value of 0.075 corrected to 0.011 |
| **Aster Global Findings - Round 2** | The correct value is now listed for EFNLEACH. Item closed. |

| Item Number | 134 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Ofty |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team how the values included for this parameter were sourced from the referenced Winjum et al 1998 article. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | While the methodology conservatively excludes harvested wood products, it is unclear why Winjum et al. 1998 remains in 10 References. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure that all in-text citations are included in Section 10 References and that no additional references are cited. |
| **Round 2 Response from Methodology Developer** | Winjum et al removed from references |
| **Aster Global Findings - Round 3** | Finding closed; Winjum removed. |

| Item Number | 135 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | SLFty |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team reviewed the parameter and determined it is appropriate. However, this finding is pending resolution of finding regarding the Winjum et al. article. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | The methodology now conservatively excludes harvested wood products. Item closed. |

| **Item Number** | 136 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Wwty |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The parameter references different application for developing vs. developed countries. However, no definition nor guidance for developing/developed countries is presented in the methodology as written. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | The methodology now conservatively excludes harvested wood products. Item closed. |

| **Item Number** | 137 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | COMF |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |

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| **Aster Global Round 1 Findings** | Parameter COMF refers to the combustion factor of a applicable vegetation type, as defined in the value applied. However, vegetation type is not defined.<br><br>Further, where plantings happen on previously bare ground it is unclear how unnatural mixed species would be appropriately allocated into a specific COMF.<br><br>As the value of COMF is determined by the vegetation type, and multiple vegetation types may be involved in project activities, information provided for this parameter should include information noting as such. |
| **Round 1 NCR/CL/OFI** | CL: Please define vegetation type.<br><br>CL: Please clarify how the application of COMF, as written, is appropriate for the census based approach<br><br>CL: Please update the parameter and the equations it is used in to indicate that multiple COMF values may be used. |
| **Round 1 Response from Methodology Developer** | Vegetation type is as defined in Table 2.6 of the IPCC 2019 Refinement. We have added the following text to the COMF parameter table under "value": "For the census-based approach, a conservative value of 1.0 is applied." |
| **Aster Global Findings - Round 2** | The application of COMF for the census-based approached has been addressed. This finding is closed. |

| **Item Number** | 138 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | GWPg |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The source of data for this parameter is the default factor for from the latest IPCC assessment report which is appropriate.<br><br>However, the value applied and justification of choice are both marked as "N/A." |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the value applied and justification of choice for this parameter are Not Applicable. |
| **Round 1 Response from Methodology Developer** | "N/A"'s eliminated |
| **Aster Global Findings - Round 2** | The audit team confirmed the value applied and justification has been added. Item closed. |

| **Item Number** | 139 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | NCwp,SF,i,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | It is unclear how inclusion of this as a parameter available at validation is appropriate.<br><br>It is unclear what the "i" in this parameter refers to. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Parameter moved to monitored parameters, subscript "I" dropped |
| **Aster Global Findings - Round 2** | The audit team confirmed this parameter has been moved to the appropriate section, 9.2 Data and Parameters Monitored. Item closed. |

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| **Item Number** | 140 |
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | NCwp,OF,I,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | It is unclear how inclusion of this as a parameter available at validation is appropriate.<br><br>It is unclear what the "i" in this parameter refers to.<br><br>The source of data for this parameter states peer-reviewed published data may be used, then an example citing default manure N contents is used. It is unclear what other peer reviewed published data would be considered appropriate, and if use of this data or the data found in the referenced study are prioritized. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Parameter moved to monitored parameters, subscript "I" dropped. Ambiguity around source of data eliminated. |
| **Aster Global Findings - Round 2** | The audit team confirmed this parameter has been moved to the appropriate section, 9.2 Data and Parameters Monitored. Item closed. |

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| **Item Number** | 141 |

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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | i |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | I is undefined as a parameter. However, is it used throughout the methodology. |
| Round 1 NCR/CL/OFI | CL: Please define parameter i. |
| Round 1 Response from Methodology Developer | Subscript "i" deleted |
| Aster Global Findings - Round 2 | The audit team confirmed this parameter subscript has been eliminated. Item closed. |

| Item Number | 142 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | j |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | J is undefined as a parameter. However, it is used throughout the methodology. |
| Round 1 NCR/CL/OFI | CL: Please define parameter j. |
| Round 1 Response from Methodology Developer | Subscript "j" deleted |
| Aster Global Findings - Round 2 | The audit team identified the subscript appears with Dj. See other finding asking for clarification whether it is appropriate to continue including this parameter given that harvested wood products are no longer accounted. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please clarify why the subscript of j has not been deleted. |
| Round 2 Response from Methodology Developer | Parameter Dj removed |
| Aster Global Findings - Round 3 | The assessment team confirms that Dj has been wholly stricken from the current version of the Methodology. This finding is closed. |

| Item Number | 143 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | t |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | t is undefined as a parameter. However, it is used throughout the methodology. |
| Round 1 NCR/CL/OFI | CL: Please define parameter t. |
| Round 1 Response from Methodology Developer | Subscript "t" is made clear throughout the methodology, as t= 1, 2, 3, … t years elapsed since the project start |
| Aster Global Findings - Round 2 | The parameter t has six different definitions used through Equation "where" sections in the Methodology and appendices. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please ensure consistent definitions of parameters. |
| Round 2 Response from Methodology Developer | Parameter t now consistently defined as "t 1, 2, 3, … t years elapsed since the project start date" |
| Aster Global Findings - Round 3 | The assessment team notes that the majority of definitions of t now state "1, 2, 3, … t years elapsed since the project start date" with exception of Eqs 6, A5, and A6 |
| Round 3: NCR/CL/OFI | CL:Please ensure consistent definitions of parameters. |
| Round 3 Response from Methodology Developer | Definition of t now consistent throughout (eqs 6, A5 and A6 revised). |
| Aster Global Findings - Round 4 | t is now described consistently throughout main body and appendices. This item is closed. |

| Item Number | 144 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | At |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |

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| **Aster Global Round 1 Findings** | See findings pertaining to this parameter in the "Parameters Available at Validation" section.<br><br>Additionally, the assessment team noted that the description for this parameter is identical to parameter At available at validation. It is unclear to the assessment team what the difference between the two parameters is.<br><br>Additionally, for the QA/QC procedures to be applied this parameter states "Ref to 9.3" which presumably means refer to Section 9.3. However, the QA/QC procedures to be applied for this parameter are not explicitly mentioned in Section 9.3. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Parameter At changed to A throughout (dropping "t" subscript). It is solely a parameter available at validation (has been dropped from parameters monitored) |
| **Aster Global Findings - Round 2** | At is still used in Equation 14 as well as the text preceding Eq 25. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure Parameter At has been changed to A throughout Methodology. |
| **Round 2 Response from Methodology Developer** | t subscript dropped from all instances of parameter A |
| **Aster Global Findings - Round 3** | The assessment team finds no more instances of At in the methodology. This finding is closed. |

| **Item Number** | 145 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Mt |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | This parameter is defined as M,t with a description of "cumulative mortality in year t." However, in application of the parameter in equations, the parameter is defined as M,I,t implying an aspect of cohorts. It is unclear how the cumulative mortality can be defined as an overall percentage, when there is no mention of combining mortality across cohorts in either the parameter or in the equation.<br><br>It is unclear how the comment for this parameter is relevant or appropriate. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Subscript "I" deleted. Comment in parameter table deleted. |
| **Aster Global Findings - Round 2** | Mt is described differently in the Data and Parameters table than in text. |

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| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure consistent descriptions of parameters |
| **Round 2 Response from Methodology Developer** | Mt defined as mortality *through*, not in, year t. Descriptions under where now match corresponding parameter table. |
| **Aster Global Findings - Round 3** | The assessment team confirms consistent descriptions of Mt throughout methodology. However, The assessment team notes that the t is not subscripted where referenced below equation 22b. |
| **Round 3: NCR/CL/OFI** | CL: Please ensure consistent use of subscripts. |
| **Round 3 Response from Methodology Developer** | t in Mt in eq 22b now subscripted. |
| **Aster Global Findings - Round 4** | Correction noted by assessment team. **This finding is closed.** |

| **Item Number** | 146 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | CPWP-woody-AB,t: Part 1 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |

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| **Aster Global Round 1 Findings** | This parameter is used for the census-based quantification, however, this parameter is not used within the text of the methodology for the census-based approach.<br><br>The source of the data is defined as "field measurement" however the description on measurements, methods and procedures to be applied refers to the possibility of a remote sensing sample. It is unclear how the defined data source is appropriate.<br><br>The parameter states "With area-based quantification, live aboveground biomass will be measured via plot-based sampling." However, it is also stated that Plot-based sampling approaches (using area-based quantification) may be augmented using double or 2-phase sampling approaches combining limited direct plot-based field measurements with wall-to-wall remote sensing metrics to eliminate sample error (and replace with model error)." It is unclear how this discrepancy is appropriate.<br><br>It is unclear to the assessment team what the phrase "may be selected by project proponents based on capacity and appropriateness" means.<br><br>There is a statement "Significant correlation with aboveground biomass pools included in the project boundary, previously substantiated with published studies." It is unclear what level of rigor is required (e.g. same species, exact species composition mix, etc.)<br><br>If remote sensing approaching is used, it is unclear if this has to be continuously applied over the lifespan of the project or if a project can alternate between this and a measured approach. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | This parameter table has been split into two, one for area-based (C_WP-woody-AB,t) and one for census-based (C_WP-woody-AB,pu,t). All instances (3) of "Acknowledging the wide range of valid approaches, and that relative efficiency and robustness are circumstance-specific, sampling, measurement and estimation procedures are not specified in the methodology and may be selected by project proponents based on capacity and appropriateness" have been removed. Use of double or 2-phase sampling approaches clarified: "Plot-based sampling approaches (using area-based quantification) may be augmented using double or 2-phase sampling approaches (e.g. 3P or ratio sampling). These approaches must include (1) a complete census of an auxiliary variable (e.g. Stocking Index, see Appendix A), and (2) a sample of direct field-based measurements used to determine the relationship (i.e. a ratio or regression) between aboveground woody biomass and the auxiliary variable. " Comment added: "Sampling approaches need not be held constant across all monitoring and verification events." |
| **Aster Global Findings - Round 2** | Following further clarification in the most recent Methodology, this finding is closed. |

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| **Item Number** | 147 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | CPWP-woody-AB,t: Part 2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | It is unclear if the statement "Validated with direct measurements of aboveground biomass pools included in the project boundary from the project region (within the national boundary), demonstrating a statistically significant ($P < 0.05$) relationship" needs to be evaluated at every monitoring period.<br><br>It is unclear why modeled error is described for this parameter as carbon stock as it does not pertain to the determination of carbon stock and the related data unit.<br><br>The description of measurement, methods, and procedures to be applied provides inconsistent approaches that are difficult to interpret as written. Please revise to ensure reader continuity.<br><br>It is unclear what the statement "apply fixed dbh and any other size thresholds" means as written. Please provide additional detail to explicitly state the approach to be applied by the methodology user.<br><br>It is unclear how the statement "Evidence must be provided confirming that equations have been validated with direct measurements collected from within the national boundary" is appropriate at a national level, rather than a more defined geography. For example, it is unclear how volume equations for Gulf Coastal Pines would be appropriate for the application of volume for the same species growing in mountainous regions.<br><br>The last paragraph in the description of measurement methods and procedures to be applied is grammatically incorrect.<br><br>The frequency is listed as every 5 years or less, however, additional detail is needed to ensure consistent application of the methodology. It is unclear if this timeline relates to the update of a subsample of plots or all plots. Further, insufficient detail is provided for the potential application of the remote sensing approach.<br><br>There is a comment that says Tool VT005 does not apply. It is unclear how this is relevant or appropriate.<br><br>It is unclear what components of aboveground biomass are to be included to ensure consistency in the application of the methodology. For example, tops, bark, etc. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |

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| **Round 1 Response from Methodology Developer** | see response for finding 146. Requirement to apply fixed size thresholds clarified to "Apply fixed dbh and any other size thresholds on independent variables used in biomass estimation (e.g. diameter at breast height, diameter at root collar, height) maintained through the crediting period" Also, guidance on establishing the relationship between aboveground woody biomass and an auxiliary variable (when using double or 2-phase sampling) has been removed. New guidance specifies that a relationship (ratio or regression) must be calculated based on direct measure samples, and any error in that relationship will be quantified and accounted at the uncertainty stage. The frequency relates to the monitoring and reporting of the parameter, not to any particular component sample unit - it is implicit that this could be derived in any number of ways (complete remeasure, subsample remeasure of original, completely independent time 2 inventory). |
| **Aster Global Findings - Round 2** | Following further clarification in the most recent Methodology, this finding is closed. |

| **Item Number** | 147.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | CWP-woody-AB,pu,I,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Findings - Round 2** | In the Parameter table, this parameter is described both as carbon "Estimated carbon stock in aboveground woody biomass in sampled planting unit pu in the project scenario in year t" and as biomass "Aboveground woody biomass will be measured via representative sampling from N planting units.". The C script implies carbon but the data units are tons of dry mass. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify whether this variable is C(arbon) or B(iomass) and make necessary corrections. |
| **Round 2 Response from Methodology Developer** | See response to finding #95. Parameter table now corrected to describe CWP-woody-AB,pu,t in units of biomass (not carbon), and this is now consistent throughout. CWP-woody-AB,pu,t now changed throughout to BWP-woody-AB,pu,t to clarify units of d.m. (not C). |
| **Aster Global Findings - Round 3** | This finding (and the related finding) are now closed. The revisions have clarified that this parameter refers to biomass (dry matter), not carbon. |

| **Item Number** | 148 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Vex,ty,j,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |

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| **Aster Global Round 1 Findings** | The source of data is listed as field measurements or mill receipts. It is unclear why the application of field measurement is applied for the census based quantification method as one could presume mill receipts for harvested product would be available and more accurate than a sampled approach.<br><br>The parameter uses ty as a subscript. It is unclear in the methodology as written how ty is to be determined for the census based approach where no scaling or mill receipts are presented. For example, a large dimension tree could go to multiple facilities depending on where it was sold.<br><br>It was noted that not all mills provide scale receipts on a cubic meter basis. The methodology provides no guidance to address this item. Further it is noted that over bark volume is needed. Based on audit team history, it is unclear when bark on volumes are provided from scale receipts, nor is there any measure to account for how bark should be added.<br><br>It is unclear why computation of Vex,ty,j,t is within the description of measurement methods and procedures to be applied instead of within the text of the methodology. Further, it is unclear why parameters used in this equation are not defined elsewhere in the methodology.<br><br>For the census based approach, it is unclear how a sample approach yields sound estimates of volume harvested (e.g. leave trees, damage trees, etc.).<br><br>It was noted in the comments that volume does not include logging slash left on site. It is unclear how this would be accounted for in the census based approach. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | The methodology now conservatively excludes harvested wood products. This item is closed. |

| **Item Number** | 149 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | CWP-SDW-pu,l,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |

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| **Aster Global Round 1 Findings** | It is unclear how the description of this parameter as the average carbon stock is appropriate given that the data unit is listed as t d.m pu-1.<br><br>The methodology states "With census-based quantification, standing dead wood will be measured via representative sampling from Ni planting units. " It is unclear why a representative sample is required when a full sample could be applied.<br><br>It is unclear what is meant by the statement sample measurements must "apply fixed size thresholds."<br><br>The methodology states "For each standing dead tree, stem volume must be estimated using published volume equations (species-, genus-,family-or forest type-specific, in order of preference from higher to lower, as available), applied to one or more measured tree attributes, minimally including dbh and remaining stem height. " It is unclear how volume equations are to be applied for broken stem trees when using volume equations as prescribed. Further, no minimum height threshold is provided within the methodology so it is unclear how dbh would be determined on a tree shorter than breast height. It is noted that remaining stem height is a required element, however, not all volume equations require stem height. It is unclear if a volume equation not utilizing stem height would be appropriate.<br><br>It is unclear how the statement "Evidence must be provided confirming that equations have been validated with direct measurements collected from within the national boundary" is appropriate at a national level, rather than a more defined geography. For example, it is unclear how volume equations for Gulf Coastal Pines would be appropriate for the application of volume for the same species growing in mountainous regions. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Standing dead wood now excluded using the census-based approach. |
| **Aster Global Findings - Round 2** | The assessment team notes that SDW is now conservatively excluded from the census-based approach.<br><br>However, using the area-based approach, it is still not made clear whether estimation of standing dead wood should include volume reductions, especially when using single-entry allometrics based on DBH. As it reads, only density reductions are taken into account. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 2 Response from Methodology Developer** | In the parameter table for DSDW we have further specified that "Note that standing dead wood is restricted here to visible aboveground stem (bole) biomass, and must discount any missing portions of the stem (e.g. referencing visible break height in volume estimation)." |
| **Aster Global Findings - Round 3** | The assessment team notes that biomass estimated from standing dead wood are now calculated by estimating biomass of an otherwise live tree and then discounted by both volume reductions and by density reductions. This follows best practices and the finding is now closed. |

| Item Number | 150 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | CWP-burn-pu,I,-Δt |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |
| Aster Global Round 1 Findings | It is unclear how the field measurements and application of allometric equations can accurately determine the average dry mass in per planting unit, especially for severely/completely burned trees. |
| Round 1 NCR/CL/OFI | CL: Please clarify in line with assessor findings. |
| Round 1 Response from Methodology Developer | Parameter dropped. Emissions from burned planting units reference biomass at time t minus t_delta, which is prior to the burn (which takes place between t_delta and t) and thus prior to any deformation from being burned. Also, post burn it is conservatively assumed that all biomass is consumed using the census-based approach - from COMF parameter table: "For the census-based approach, a conservative value of 1.0 is applied." Duplicate COMF parameter table deleted. Parameters elsewhere with t=t minus tdelta do not need separate parameter tables beyond those provided w subscript "t" (t minus t delta is a t value). |
| Aster Global Findings - Round 2 | The audit team notes this parameter has been dropped. The finding is closed. |

| Item Number | 151 |
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| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Up,t |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | ARR Methodology |

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| **Aster Global Round 1 Findings** | The source of data notes sourced from field measurements, however, the methodology defines approaches beyond field measurements for this parameter, for example remote sensing measurements. It is unclear how this is appropriate as written. Similarly, the first paragraph speaks to field measurements, however, the second paragraph is about remote sensing.<br><br>The description of measurement methods and procedures to be applied refers to parameters such as UP=woody,t however no such parameters exist, nor do they represent the uncertainty as implied. It is unclear why for the remote sensing model for 2 times the root mean squared error of the regression is appropriate, rather than a 95% confidence interval.<br><br>Pools are defined in the comments, rather than their own separate parameter. Please address.<br><br>The methodology states "Where conservative default values of SOC are applied, parameter Up=SOC,t is assumed to equal zero. " It is unclear what the referenced conservative default values mentioned refer to, as they are not defined within the methodology.<br><br>For the census based quantification approach, it is unclear how the uncertainty associated with harvested wood products is equivalent to the uncertainty associated with woody biomass, as there is no requirement that the entirety of woody biomass stocks be harvested in a given period.<br><br>No QA/QC procedures are included, nor are calculation methods defined as required by the template. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Treatment of uncertainty when using double or 2-phase sampling approaches now clarified: "Where double or 2-phase sampling approaches are employed for aboveground woody biomass, using a wall-to-wall remote sensing metric, parameter Up=woody,t is represented by model error in the relationship (ratio or regression) between the remote sensing metric auxiliary variable and aboveground woody biomass, referencing the 905% confidence interval of the ratio or 2 1.67 times the root mean squared error of the regression. Sample error in the auxiliary variable is not treated, because it must be subject to a complete census (see parameter table for C_(WP-woody-AB,t) above)." Note that the allowance for double or 2-phased sampling approaches allows for direct field measurement to be *augmented with* (*not* "replaced by") remote sensing to improve precision and efficiency of field measurements. Discussion of default values of SOC removed. Harvested wood products no longer included in the accounting boundary. Calculation of uncertainty is not pool dependent, thus this single parameter table is sufficient to address all pools (and exceeds precedent of VM45, which simply references variance in equations without corresponding parameter tables). |

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| **Aster Global Findings - Round 2** | It is unclear why the RMSE is multiplied by 1.67 to determine sample error at a 90th % confidence in the case that p is woody carbon stock, and is estimated through double or 2-phase sampling. Additionally, it is specifically noted that users must employ a 90% confidence interval of the ratio where p is woody biomass and ratio estimation is employed. The Methodology allows for ratio estimation of litter and herbaceous biomass; it is unclear why it is not also stated that users must employ a 90% confidence interval of the ratio where p is litter or non-woody biomass and ratio estimation is employed. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 2 Response from Methodology Developer** | With double sampling for CWP-woody-AB,t, the first stage must be a complete census (so no sample error). Relevant t value referenced changed from 1.67 to 1.645. In the parameter table for Up,t, we have added the following text "Where double or 2-phase sampling approaches are employed for non-woody biomass and/or litter, i.e. where subsampling is employed to estimate dry-to-green weight ratio that is then applied to a sample estimate of green weight (see parameter tables for DMWP-herb,t and DMWP-LI,t), parameters Up=non-woody,t and Up=litter,t are calculated propagating sample error of the green weight estimate and sample error of the estimate of dry-to-green weight ratio." and have also noted the different uncertainty under comments in the non-woody biomass and litter parameter tables). |
| **Aster Global Findings - Round 3** | The assessor finds that the multiplier for RMSE to estimate the margin of error has been correctly changed. The assessor also finds that the "Description of measurement methods and procedures to be applied" field for Upt now directs users how to correctly determine uncertainty in the instance where users apply double sampling to estimate non-woody pools of carbon stock. This finding is closed. |

| **Item Number** | 152 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Aburn,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how the potential for projects employ stratification is accounted for in this parameter.<br><br>The parameter description is "area burnt at time t." However, in the equation it is used in, it is described as "area burnt in year t". |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | As per other findings responses, references to stratification deleted. Parameter description now consistent throughout as "Area burnt in the monitoring interval ending in year t" |

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| **Aster Global Findings - Round 2** | The description of Aburn,t has been clarified. This finding is closed. |

| **Item Number** | 153 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Afert |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear why an areal component for fertilizer application is necessary. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Emissions from fertilizer application are estimated using mass applied and area over which the mass of fertilizer is applied. Emissions are first calculated as an average tCO2e per unit area, and then multiplied by A_fert to calculate total emissions in tCO2e. |
| **Aster Global Findings - Round 2** | Pending response to MWP,SF,I,t and MWP,OF,I,t. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | |
| **Round 2 Response from Methodology Developer** | |
| **Aster Global Findings - Round 3** | This finding is closed following revisions to the methodology with regards to an areal component used in this parameter's relevant equations. |

| **Item Number** | 154 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | MWP,SF,I,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The data unit for this parameter is stated as "t fertilizer" However its application in equations is in t fertilizer ha-1. It is unclear how this is appropriate.<br><br>It is unclear what the "i" in this parameter refers to. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |

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| **Round 1 Response from Methodology Developer** | As per other findings responses, references to stratification (subscript i) deleted. Units for this parameter are now consistent throughout as t per ha. |
| **Aster Global Findings - Round 2** | Given that Mwp,SF,t is described as "Average mass of N containing synthetic fertilizer applied in Afert in the monitoring interval ending in year t" and the source of data is "Average mass of N containing synthetic fertilizer applied in Afert in the monitoring interval ending in year t", it remains unclear why Afert needs to be scaled by area.<br><br>Mwp,SF,t is described differently in Data and Parameters than in text. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify the description of Mwp,SF,t<br>CL: Please ensure consistent descriptions of parameters throughout Methodology. |
| **Round 2 Response from Methodology Developer** | See response to finding #42. Afert removed and accounting of N2O fertilizer emissions now changed to exclude area component (now solely mass-based). Description of Mwp,SF,t now consistently "Mass of project N containing synthetic fertilizer applied in the monitoring interval ending in year t" |
| **Aster Global Findings - Round 3** | Following revisions to the methodology both issues raised in this finding are now adequately addressed. |

| **Item Number** | 155 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | MWP,OF,I,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | The data unit for this parameter is stated as "t fertilizer" However its application in equations is in t fertilizer ha-1. It is unclear how this is appropriate.<br><br>It is unclear what the "i" in this parameter refers to. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | As per other findings responses, references to stratification (subscript i) deleted. Units for this parameter are now consistent throughout as t per ha. |
| **Aster Global Findings - Round 2** | Given that Mwp,OF,t is described as "Average mass of N containing organic fertilizer applied in Afert in the monitoring interval ending in year t" and the source of data is "Average mass of N containing organic fertilizer applied in Afert in the monitoring interval ending in year t", it remains unclear why Afert needs to be scaled by area.<br><br>Mwp,OF,t is described differently in Data and Parameters than in text. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify the description of Mwp,OF,t<br>CL: Please ensure consistent descriptions of parameters throughout Methodology. |

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| **Round 2 Response from Methodology Developer** | See response to finding #42. Afert removed and accounting of N2O fertilizer emissions now changed to exclude area component (now solely mass-based). Description of Mwp,OF,t now consistently "Mass of project N containing organic fertilizer applied in the monitoring interval ending in year t" |
| **Aster Global Findings - Round 3** | Following revisions to the methodology both issues raised in this finding are now adequately addressed. |

| **Item Number** | 156 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | BSDW,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team what the phrase "may be selected by project proponents based on capacity and appropriateness" means.<br><br>It is unclear what is meant by the statement sample measurements must "apply fixed size thresholds."<br><br>The methodology states "For each standing dead tree, stem volume must be estimated using published volume equations (species-, genus-,family-or forest type-specific, in order of preference from higher to lower, as available), applied to one or more measured tree attributes, minimally including dbh and remaining stem height. " It is unclear how volume equations are to be applied for broken stem trees when using volume equations as prescribed. Further, no minimum height threshold is provided within the methodology so it is unclear how dbh would be determined on a tree shorter than breast height. It is noted that remaining stem height is a required element, however, not all volume equations require stem height. It is unclear if a volume equation not utilizing stem height would be appropriate.<br><br>It is unclear how the statement "Evidence must be provided confirming that equations have been validated with direct measurements collected from within the national boundary" is appropriate at a national level, rather than a more defined geography. For example, it is unclear how volume equations for Gulf Coastal Pines would be appropriate for the application of volume for the same species growing in mountainous regions.<br><br>The frequency is listed as every 5 years or less, however, additional detail is needed to ensure consistent application of the methodology. It is unclear if this timeline relates to the update of a subsample of plots or all plots. |

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| **Round 1 Response from Methodology Developer** | All instances (3) of "Acknowledging the wide range of valid approaches, and that relative efficiency and robustness are circumstance-specific, sampling, measurement and estimation procedures are not specified in the methodology and may be selected by project proponents based on capacity and appropriateness" have been removed. Requirement to apply fixed size thresholds clarified to "Apply fixed dbh and any other size thresholds on independent variables used in biomass estimation (e.g. diameter at breast height, diameter at root collar, height) maintained through the crediting period" See other responses on related parameters (addressing duplicate findings). |
| **Aster Global Findings - Round 2** | The assessment team could not identify which equation Bsdw,t is used in. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify which equation Bsdw,t is used in. |
| **Round 2 Response from Methodology Developer** | See response to finding #102. Bwp-sdw,t and Bwp-LDW corrected to BSDW,t and BLDW,t (now consistent with parameter tables). BSDW,t and BLDW,t are both used in the dead wood equation to produce CWP-DW (currently eq. 11) |
| **Aster Global Findings - Round 3** | The methodology developers have corrected the name for this parameter. This finding is closed. |

| **Item Number** | 157 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | BLDW,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team what the phrase "may be selected by project proponents based on capacity and appropriateness" means.<br><br>It is unclear what is meant by the statement sample measurements must "apply fixed size thresholds."<br><br>The frequency is listed as every 5 years or less, however, additional detail is needed to ensure consistent application of the methodology. It is unclear if this timeline relates to the update of a subsample of plots or all plots. |

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| **Round 1 Response from Methodology Developer** | All instances (3) of "Acknowledging the wide range of valid approaches, and that relative efficiency and robustness are circumstance-specific, sampling, measurement and estimation procedures are not specified in the methodology and may be selected by project proponents based on capacity and appropriateness" have been removed. Requirement to apply fixed size thresholds clarified to "Apply fixed dbh and any other size thresholds on independent variables used in biomass estimation (e.g. diameter at breast height, diameter at root collar, height) maintained through the crediting period" The frequency relates to the monitoring and reporting of the parameter, not to any particular component sample unit - it is implicit that this could be derived in any number of ways (complete remeasure, subsample remeasure of original, completely independent time 2 inventory). |
| **Aster Global Findings - Round 2** | The audit team could not identify which equation Bldw,t is used in. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify which equation Bldw,t is used in. |
| **Round 2 Response from Methodology Developer** | See response to finding #102. Bwp-sdw,t and Bwp-LDW corrected to BSDW,t and BLDW,t (now consistent with parameter tables). BSDW,t and BLDW,t are both used in the dead wood equation to produce CWP-DW (currently eq. 11) |
| **Aster Global Findings - Round 3** | The methodology developers have corrected the name for this parameter. This finding is closed. |

| **Item Number** | 158 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | DMWP-LI,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | ARR Methodology |
| **Aster Global Round 1 Findings** | It is unclear how the unit t d.m. ha.-1 is appropriate as there is no mention of an areal component within the description of this parameter.<br><br>The frequency of monitoring is defined as at t=0 and subsequently every 10 years or less. However, additional details are required, particularly regarding the breadth of the sampling effort and why sampling is only required every 10 year for this parameter but 5 years for most of the others. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Description clarified to dry mass per hectare. Required monitoring frequency revised to every 5 years or less. |
| **Aster Global Findings - Round 2** | The audit team confirms the changes in developer's response were incorporated. This finding is closed. |

| **Item Number** | 159 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | CWP-soil,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | VCS ARR Methodology12August2022, Nelson and Sommers, |
| **Aster Global Round 1 Findings** | It is unclear to the assessment team how this parameter can be reliably determined from the information provided, given the project proponent is able to choose the methods for sampling, measurement, and estimation. A significant burden is placed on the assessment team to determine the appropriateness of the sampling and analysis methods chosen by the project developer.<br><br>Some specifics on sampling are provided and multiple references citing soil sampling best practices are provided. However it is unclear which of these references is preferable, and how project proponents are to determine which one to use.<br><br>Further, it is unclear how this parameter is to be estimated from sampling. It is unclear how allowing the project proponent to choose their estimation method is appropriate, as no specifics are provided regarding estimation and no suggested guidance is provided.<br><br>It is unclear to the assessment team what the phrase "may be selected by project proponents based on capacity and appropriateness" means.<br><br>It is unclear how the unit t C ha.-1 is appropriate as there is no mention of an areal component within the description of this parameter.<br><br>QA/QC procedures to be followed are provided, but elsewhere it is stated that project proponents are to determine QA/QC procedures and outline them in the monitoring plan. It is unclear how this is appropriate.<br><br>The frequency of monitoring is defined as at t=0 and subsequently every 10 years or less, however additional details are required, particularly regarding the breadth of the sampling effort and why sampling is only required every 10 year for this parameter but 5 years for most of the others.<br><br>Please note that the Nelson and Sommers chapter in Methods of Soil Analysis is superseded by the 1996 version of the same chapter. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |

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| **Round 1 Response from Methodology Developer** | All instances (3) of "Acknowledging the wide range of valid approaches, and that relative efficiency and robustness are circumstance-specific, sampling, measurement and estimation procedures are not specified in the methodology and may be selected by project proponents based on capacity and appropriateness" have been removed. Frequency of monitoring has been revised to "At time t=0 and subsequently at every verification subsequently (every 10 5 years or less).<br><br>Where soil disturbance from the project activity (i.e. from site preparation);<br>• occurs no more than once during the project crediting period (i.e. at site preparation) and<br>• does not involve soil inversion to a depth exceeding 25 cm (e.g. that would result from a moldboard plow)<br>soil organic carbon may be monitored less frequently (not less than every 10 years) than other pools and reported as zero during intervening verifications." The allowance for less frequent sampling (where no net losses/emissions would go unreported) would mean that SOC change would be assigned to the vintage year in which it is reported and verified (even though accumulation has been ongoing prior to that reporting year) - this treatment is justified based on VCS RIP v4.1, Section 4.1.2 which states that "The Verra Registry can display separate vintages within one verification period" and "The creation of such separate VCU issuance records in respect of one verification period is only possible where the monitoring report and associated verification report specify the vintage breakdown." This would suggest that if the monitoring report does not specify the vintage breakdown the vintage assigned to all credits would be the year in which the verification occurs. Reference to Nelson and Sommers updated to 1996 edition. |
| **Aster Global Findings - Round 2** | The assessment team noted that in the "Frequency of Monitoring/Reporting" section that monitoring must occur at every verification (every 5 years or less) in one section, and not less than every 10 years in another sentence. It is unclear what the frequency of monitoring is to be. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Text for soil organic carbon parameter frequency revised for clarification: "soil organic carbon may be *measured* less frequently (not less than every 10 years) than other pools and reported as zero during intervening *monitoring and verification* events" The assessment team agreed that it was reasonable to measure SOC on a less frequenct basis than other pools, provided that no significant emission could be expected to go un-accounted for (hence the included required conditions: "Where soil disturbance from the project activity (i.e. from site preparation);<br>• occurs no more than once during the project crediting period (i.e. at site preparation) and<br>• does not involve soil inversion to a depth exceeding 25 cm (e.g. that would result from a moldboard plow)") => the parameter tables now makes clear that SOC, and all pools, must be monitored and reported every 5 years or less, but that measurement of SOC may be on a less frequent basis. |
| **Aster Global Findings - Round 3** | Revisions to the Methodology now make it clear that SOC must be monitored/recorded at a frequency of every 5 years or less but must be measured every 10 years or less. |

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| **Item Number** | 160 |

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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **Appendix A**<br>Data and Parameters Available at Validation |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A |
| **Aster Global Round 1 Findings** | All parameters used in identified equations are not defined in this section. |
| **Round 1 NCR/CL/OFI** | CL: Please ensure all necessary parameters are appropriately defined. |
| **Round 1 Response from Methodology Developer** | The only parameter included in equations that is not calculated is SI, which has a parameter table. MD (multivariate distance metric) is unspecified and no parameter table is provided (consistent w VM45 re Mahalanobis Distance). |
| **Aster Global Findings - Round 2** | The audit team affirmed the completeness of the Data and Parameters table. |

| **Item Number** | 161 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Data and Parameters Monitored |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A |
| **Aster Global Round 1 Findings** | All parameters used in identified equations are not defined in this section. |
| **Round 1 NCR/CL/OFI** | CL: Please ensure all necessary parameters are appropriately defined. |
| **Round 1 Response from Methodology Developer** | The only parameter included in equations that is not calculated is SI, which has a parameter table. MD (multivariate distance metric) is unspecified and no parameter table is provided (consistent w VM45 re Mahalanobis Distance). |
| **Aster Global Findings - Round 2** | The audit team affirmed the completeness of the Data and Parameters table. |

| **Item Number** | 162 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Siscenario,l,t |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A |
| **Aster Global Round 1 Findings** | It is unclear what this parameter is referring to. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with assessor findings. |
| **Round 1 Response from Methodology Developer** | Parameter name in table changed to SI_control,scenario,i,t and SI_wp,t for clarity. |
| **Aster Global Findings - Round 2** | The assessment team affirmed the inclusion of SI_control and SI_wp in the Data and Parameters table. However, SI is described as (1) the stocking index, (2) the stock index value, and (3) Index of carbon stocks. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure consistent description of parameters. |
| **Round 2 Response from Methodology Developer** | Now referred to consistently in the Appendix as stocking index (or plural stocking indices). |
| **Aster Global Findings - Round 3** | The assessment team confirmed consistent usage of stocking index. This finding is closed. |

| **Item Number** | 163 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Public Comments |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Public Comments |
| **Aster Global Round 1 Findings** | The assessment team reviewed the public comments. Due to the scope of changes the draft methodology contains and will contain, the assessment team believes it should be re-posted for public comments. At the very least, an updated draft should be provided to the original commenters, similar to what occurred for the Leakage Module. |
| **Round 1 NCR/CL/OFI** | OFI: Consider re-posting the methodology for public comments, or providing a revised draft to the original commenters for their review prior to assessment. |
| **Round 1 Response from Methodology Developer** | Verra has determined that repost the methodology would cause considerable delay. It is typical for methodologies to change after public comment review. |
| **Aster Global Findings - Round 2** | The methodology developer has chosen not to repost for comment , citing determination from Verra. Item closed. |

| **Item Number** | 164 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | VVB must ensure that terms are used consistently across the methodology. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team noted that in Section 2 under the description of census-based approach, it refers to tree plantings. It is unclear why this language is appropriate or consistent with the rest of the methodology that includes both woody and non-woody plantings. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the language applied is appropriate and consistent. |
| **Round 1 Response from Methodology Developer** | Language in Section 2 clarified with "tree (or other defined “planting unit”, including e.g. bamboo plantings) " Non-woody biomass is excluded from the census-based approach accounting boundary per Tables 1 and 2. |
| **Aster Global Findings - Round 2** | The clarification and edits made are sufficient to close this finding. Item closed. |

| **Item Number** | 165 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Baseline approach Specification |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The methodology states that either baseline approach or a combination of the two can be applied as long as approach specific applicability conditions are met and they do not overlap. It is unclear how this is to be assessed, as no guidance has been provided for this process. Further, it leaves open the possibility of falsely including surrounding areas around planted trees using the census approach with the area-based approach at a scale that is irrational. **This is related to the Finding in Methodology Requirements under Section 2.3.7.**<br><br>Further, it is unclear how area would be determined for plantings that spread over the life of the project, for example bamboo, as it could potentially increase "project area" over the course of the project lifespan. |

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| **Round 1 NCR/CL/OFI** | CL: Please clarify in the methodology how the allocation of approaches is to be applied. Further, please clarify how the allocation allows for consistent determination and prevents the potential inclusion of areas into the area-based approach that would otherwise be unavailable in the census based approach.<br><br>CL: Please clarify how the allocation of approaches is to be done on plantings that will likely expand or adjust project areas over the course of the project lifespan. |
| **Round 1 Response from Methodology Developer** | Clear criteria are now provided to select the quantification approach, see Table 1. Projects must use the census-based approach if the ARR activity will not produce continuous vegetative cover on any contiguous area exceeding 1 hectare. Projects must use the area-based approach The if the ARR activity ARR activity can be clearly delineated spatially, and area calculated using GIS will produce continuous vegetative cover on any contiguous area exceeding 1 hectare (i.e. can be clearly delineated spatially). Area is only necessary using the area-based approach, in which case project area spatial layer is fixed. Expansion via rhizomes (scenario suggested) could be accomodated via a grouped project approach, whereby expansion areas beyond original instance boundary are incorporated into the project at a later date as a new instance. |
| **Aster Global Findings - Round 2** | CL1: The assessment team believes bamboo to be considered aboveground non-woody biomass. Table 2 explicitly excludes aboveground non-woody biomass if using the census-based quantification approach, while Table 1b (note there are erroneously two Table 1s) appears to allow bamboo in the census-based approach.<br><br>CL2: The clarification of this item will further inform our assessment of how the "spreading" of bamboo could lead to double-counting if a project utilizes both the area and census-based approaches. Please ensure the Definitions section of the methodology includes these key terms for the various pools (e.g., aboveground woody biomass versus aboveground non-woody biomass). |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the finding. |
| **Round 2 Response from Methodology Developer** | The definition of woody biomass is now specified in the methodology, and includes bamboo, as well as palms. Note that IPCC GPG2006GL includes palms and bamboo under woody biomass, while acknowledging in the definition that this is not strictly correct in the botanical sense. We have added to Table 1 the following requirement: "Based on growth traits of planted species, individual planting unit crowns are unlikely to expand beyond 10 meters radius from their originally established location" to avoid area-based/census-based overlap. Note that this would preclude, e.g. running bamboo types from application of the census-based approach. And in Section 5 we have added the following: "For the census-based quantification approach, there is no spatial accounting boundary. However, to ensure non-overlap in accounting boundaries when using area-based and census-based approaches in combination, and to assess VCS eligibility and methodology applicability conditions. the relevant spatial boundary for the census-based approach is a 10 meter radius buffer around the recorded GPS location of each planting unit. " These requirements for a constrained spatial footprint for planting units would in practice, and readily appraised by a VVB |

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| | at project validation, disallow the use of running bamboo types in the census-based approach. |
| **Aster Global Findings - Round 3** | The Methodolody Developers have added language to define–and keep constrained–the project area of an instance using the census-based approach to a 10-m radius around each planting unit. Further, the expected growth of planting units should be expected not to exceed a 10 m radius. Thus spreading plants (e.g. those that reproduce clonally) are precluded from the census-basis. In addition, Methodology Developers have provided precedent for the treatment of bamboo as woody biomass. This finding is closed. |

| **Item Number** | 166 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Planting Unit |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 3: Definitions |
| **Aster Global Round 1 Findings** | The definition "clearly defined woody plants" then specifies "bamboo clump" for example. It is unclear how a clump is in line with the earlier portion of the definition. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify the definition to allow for consistent application. |
| **Round 1 Response from Methodology Developer** | Clarified to *discrete* bamboo clump. Clump is the appropriate unit in this case (in place of a culm) because the clump is a single plant, and readily delineated (in clumping species). |
| **Aster Global Findings - Round 2** | The discretization of bamboos into clumps rather than individual stems assumes allometric equations are available to estimate biomass. The assessment team is aware of allometric equations relying on diameter at breast and culm height. Further, the Parameter CWP-woody-AB gives guidance on applying allometry for trees only and not bamboos or other woody non-tree plants. |

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| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please provide a reference that would demonstrate the definition of bamboo as a clump would be workable for estimating biomass. |
| **Round 2 Response from Methodology Developer** | The planting unit definition states: "Clearly defined individual woody plants (e.g,. tree, shrub, discrete bamboo clump) that are identifiable in the field " See Lieurance et al 2018 (provided w this response) - "Bamboo species are often divided into running (leptomorph) and clumping (pachymorph) types based on the morphology of their rhizomes ... Clumping bamboo species have a smaller footprint and short, thick rhizomes that curve upwards ending in a culm, forming dense clumps with minimal spatial spread (McClure, 1966)." Clumping bamboo identifiable as a discrete planting unit in the field. Per the methodology then, each sampled planting unit requires a biomass estimate. In this case, biomass would be readily estimated by measuring each culm in the clump, applying a biomass equation (e.g. Tripathi, S. K., and K. P. Singh. "Culm Recruitment, Dry Matter Dynamics and Carbon Flux in Recently Harvested and Mature Bamboo Savannas in the Indian Dry Tropics." Ecological Research 11, no. 2 (August 1996): 149–64.), and then summing them to the clump level. This finding is more appropriately directed to applications of the methodology, rather than the methodology itself -> a project proponent will have to demonstrated that their selected planting unit meets the methodology definition and a biomass estimate can be calculated at the planting unit scale. |
| **Aster Global Findings - Round 3** | The Methodology developers gave an example for how allometry could be applied to clumping bamboo to produce an estimate of the Parameter CWP-woody-AB.<br>This finding is closed. |

| **Item Number** | 167 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1. Project Accounting Boundary |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The text outlines the project accounting boundaries and where they are to be applied for the related baseline. However, this is not located in the project boundary section of the methodology as required. |
| **Round 1 NCR/CL/OFI** | NCR: Please ensure all project boundary details are included in the appropriate project boundary section, rather than Table 1. |
| **Round 1 Response from Methodology Developer** | The project boundary is included here to provide an overview of the differences between the accounting approaches. The table is consistent with the formal project boundary requirements established in Tables 2 and 3 (that respond directly to the methodology template). |
| **Aster Global Findings - Round 2** | Thank you for the clarification, the assessment team determined that the inclusion of project boundary information in the referenced section is appropriate. However, the assessment team noted that there are two "Table 1"s in the methodology. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please update table numbering and all associated references. |

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| **Round 2 Response from Methodology Developer** | Table numbering and references have been updated |
| **Aster Global Findings - Round 3** | The assessment team confirmed the tables have been appropriately updated, noting that the first "Table 1" falls outside the body of the methodology itself. Item closed. |

| **Item Number** | 168 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1. Census-based |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The quantification approach states this method is best applied to dispersed planting activities that do not result in a change in land cover/land use. It is unclear if this method is allowed for larger parcels where all trees are incorporated, for example a 20-acre planted forest.<br><br>Similarly, it is unclear if there a maximum or minimum number of planting units *Ni*. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify if the census-based approach is allowed for larger parcels, for example cover/land use changes.<br><br>CL: Please clarify if there are limits on the number of *Ni*. |
| **Round 1 Response from Methodology Developer** | There is no maximum or minimum numbering of planting units (nor does this need to be made explicit). As per other finding responses, Table 1 has been updated to clearly delineate circumstances in which the census approach must be used - "Projects must use the census-based approach if the ARR activity will not produce continuous vegetative cover on any contiguous area exceeding 1 hectare." |
| **Aster Global Findings - Round 2** | Pending resolution of findings pertaining to area in the census-based approach. |
| **Aster Global Findings - Round 3** | The assessment team has closed relevant findings pertaining to the census based approach, upon which this item was pending. Item closed. |

| **Item Number** | 169 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1. Census-based |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |

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| **Aster Global Round 1 Findings** | The methodology states that GPS is to be used for the planting units. However, the assessment team was unable to locate a level of precision to be used with this determination. This could have bearing, especially dependent on plantings with smaller spacings, where inaccuracies of commercial grade GPS exceed planting spacings. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the GPS locations are to be used in the methodology and clarify whether a specified GPS precision is required. Further, please clarify how the approach taken addresses the assessment team concerns of small planting spacing. |
| **Round 1 Response from Methodology Developer** | GPS accuracy now specified - "with minimum accuracy of 5 meters." Also, each planting unit now must be given a physical marker onsite (added to Table 1). |
| **Aster Global Findings - Round 2** | A minimum of 5m accuracy has been clarified. The assessment team is wondering if the developer has considered the potential cost prohibitiveness of requiring a tag and unique ID for every tree in a large-scale ARR census-based project. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | OFI: Please reconsider the requirement to tag and GPS every planting unit, but also consider how this may affect the inventory accuracy. |
| **Round 2 Response from Methodology Developer** | The critical element of accuracy needed for the inventory is to locate a specific planting unit from the census list. The GPS location will allow measurement personnel to find the approximate location (within GPS error) of the planting unit, and then search and identify the specific planting unit of interest confirming its unique ID (corresponding to the census list from which it was sampled) with the physical tag (with unique ID written on it). |
| **Aster Global Findings - Round 3** | The methodology developer's resposne clarified the purpose of tagging/GPS planting units. As this was on OFI, no action was required. Item closed. |

| **Item Number** | 170 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1. Census-based |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The assessment team noted that no pre-existing biomass may be removed to provide space for the plantings. It is unclear to the assessment team how this requirement would account for other encroachment from the planting onto existing woody or non-woody biomass over the course of the project life, e.g., bamboo plantings that may overtake other vegetation, or trees that may shade out pre-existing trees nearby or grasses/shrubs. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the condition as presented is appropriate and please address assessment team findings. |

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| **Round 1 Response from Methodology Developer** | Questions about the validity of a zero baseline using the census-based approach have been raised. As explained in the methodology, the relevant baseline scenario for the approach is represented by the absence of planting, i.e., planting units are not propagated and planted. This is justified because by the applicability condition (Table 1): "Planting units must be directly planted through the project activity", which means that plantings are directly attributable to the project activity, and would not exist otherwise (further supported by the required additionality demonstrations, that the project activity is not common practice and faces a financial barrier). Again, the project boundary is the planting unit itself, and has no areal component. We acknowledge that planting units in reality do not exist in a vacuum, and will occupy some area of growing space on the land; concern about negative impacts on existing vegetation caused by the project activity should technically be considered leakage. Negative impacts could result from, (1) removal of pre-existing biomass during site prep and planting, (2) competition with neighbors, or (3) displacement of future vegetation (that could have occupied that growing space). Number 1 is directly addressed by the applicability condition (Table 1) "No pre-existing woody biomass (e.g., trees or shrubs) is removed to provide space for the plantings (confirmed via pre-project photos and/or attestation)." Negative impacts from numbers 2 and 3 would be of concern where growing space is limited and trees are likely to become established. Such conditions would be represented in a forest, and thus the additional applicability condition (Table 1) "The project activity must take place within an area with pre-existing tree canopy cover < 30% [i.e. not a forest] and/or subject to continuous cropping or in a settlements or other lands land use category [i.e. land management is such that significant new tree establishment is unlikely to be permitted]." The additional applicability condition (Table 1) "will not produce continuous vegetative cover on any contiguous area exceeding 1 hectare" further minimizes potential for significant negative effects from competition/displacement, disallowing the example scenario (spreading bamboo) from using the census-based approach. Regarding competition with neighbors, plantings established in the census-based approach would compete with, and equally be subject to competition from, any neighboring pre-existing vegetation. We would expect these effects to be roughly equal and cancel out. We are also conservatively ignoring positive effects produced around plantings, due to e.g. mycorrhizal networks, increased water availability (via hydraulic lift), and amelioration of limiting site and microclimate conditions. |

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| **Aster Global Findings - Round 2** | Table 1(b) states "Projects must use the census-based approach if the ARR activity will not produce continuous vegetative cover on any contiguous area exceeding 1 hectare." This appears to somewhat conflict with the proceeding statement that "The project activity must take place within an area with pre-existing tree canopy cover < 30% and/or subject to continuous cropping4 or in a settlements or other lands land use category." "Vegetative cover" is not the same as "tree canopy cover," and these should be the same within this table and for consistency. The concern is that trees could be planted within a shrub field, thus removing existing vegetation.<br><br>Although the applicability conditions referenced in the finding do provide for minimization of potential for competition, there is concern that 30% is a high bar and that planting within areas within a canopy cover of up to 30% is more applicable to an IFM project.<br><br>This is also pending the above finding about whether bamboo should be considered woody or non-woody. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address the finding. |
| **Round 2 Response from Methodology Developer** | Requisite consdition for census-based approach in Table 1 now revised to "The project activity must take place within an area with pre-existing woody biomass cover < 10% " and "vegetative cover" revised to "woody biomass cover" consistently. |
| **Aster Global Findings - Round 3** | The revised applicability conditions adequately address the concerns raised in this finding. |
| **Aster Global Findings - Round 6** | The removal of Table 1 resulted in a review of the revised applicability conditions. It was noted that the response to the Finding from Round 2 indicates the use of "canopy" was changed to "woody biomass". However, it appears the final applicability condition (4) uses canopy again, thus re-inserting the concern about woody biomass being removed as a result of the project. |
| **Round 6: NCR/CL/OFI** | CL: Please clarify why canopy is being utilized instead of woody biomass in the final applicability conditions. |
| **Round 6 Response from Methodology Developer** | *The developer noted the finding in an email and responded with the following:*<br><br>Replaced “canopy” with “woody biomass” in applicability conditions to address finding 1 below. |
| **Aster Global Final Findings** | The changes are sufficient to address the finding. Item closed. |

| **Item Number** | 171 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1. Census-based |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The table describes the approach as having no spatial boundary. However, this appears to run in direct conflict with detail laid out in Section 5 that specifies a boundary must be delineated for the census-based approach. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the boundary as presented is appropriate in line with the assessment team findings. |
| **Round 1 Response from Methodology Developer** | In the census-based approach, the area is not an accounting boundary, so statement in Table 1 is accurate (and now clarified to "no *spatial* accounting boundary). Referenced Section 5 also makes clear ("Note that the project boundary must be delineated even for the census-based quantification approach, to assess VCS eligibility and methodology applicability conditions") that the boundary is used to assess VCS eligibility and methodology applicability conditions (again, not as an accounting boundary). Under Section 9.3 #5, reference to "spatially" eliminated. |
| **Aster Global Findings - Round 2** | Pending Finding 42. |
| **Aster Global Findings - Round 3** | The assessment team has closed relevant findings pertaining to the census based approach, upon which this item was pending. Item closed. |

| **Item Number** | 172 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1. |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The methodology lays out pools that are applied for either the area-based or census-based cases. However, no guidance is provided for a project that employs both cases simultaneously. |
| **Round 1 NCR/CL/OFI** | CL: Please provide guidance clarifying accounting boundaries when both baseline scenarios are applied. |
| **Round 1 Response from Methodology Developer** | Text preceding Table 1 ("Where the two approaches are used together, they must be applied in non-overlapping areas defined at the project start") makes clear that the approaches are not used together on the same location (i.e. "stacked"), but must be accounted separately, with different accounting boundaries specified at project start (more restricted in the census-based). |
| **Aster Global Findings - Round 2** | Pending Finding 42. |
| **Aster Global Findings - Round 3** | The assessment team has closed relevant findings pertaining to the census based approach, upon which this item was pending. Item closed. |

| **Item Number** | 173 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 4: Applicability Conditions |
| **Aster Global Round 1 Findings** | The table states a complete census of all planting units is maintained. However, throughout the methodology, sampling is applied for the census approach, thus not maintaining a complete census. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how the methodology as currently presented with allowable and often required partial sampling is appropriate for the maintenance of a complete census of all planting units. Otherwise, please modify the methodology to ensure that all equations and procedures for the census-based approach maintain a complete census. |
| **Round 1 Response from Methodology Developer** | Table 1 amended to delete "maintained" A census does not need to be maintained, only an initial census. |
| **Aster Global Findings - Round 2** | The clarification that a census is not maintained, but rather an initial census conducted is sufficient to close this finding. Item closed. |

| **Item Number** | 174 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Census-Based boundary delineation |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 5: Project Boundary |
| **Aster Global Round 1 Findings** | The project states that boundary and project area must be determined for year t. However, it is unclear how/when the project area would change following start date in the absence of a grouped project design, which is handled externally from the methodology, thus necessitating the year t component. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify how total project area changes from the project start date and how this is appropriate. |
| **Round 1 Response from Methodology Developer** | Subscript t dropped. |
| **Aster Global Findings - Round 2** | The referenced subscript has not been dropped in the referenced location of the current version of the methodology. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please ensure that subscript t is dropped from the "area" parameter throughout the entire methodology. |
| **Round 2 Response from Methodology Developer** | Subscript t dropped from all instances of parameter A. |

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| **Aster Global Findings - Round 3** | The assessement team confirmed the subscript has been appropriately dropped. Item closed. |

| **Item Number** | 175 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Census-Based boundary delineation |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 5: Project Boundary |
| **Aster Global Round 1 Findings** | The section states that project boundary for the census-based approach must be delineated. It is unclear based on the presented text how this is to be done. Further, it is unclear how the assessment addresses the potential for planting growth over the lifespan of the project. **This is related to the previous Finding 171 above.** |
| **Round 1 NCR/CL/OFI** | CL: Please clarify and provide methods for how the census based boundary is to be delineated, addressing assessment team findings. Further, please clarify the appropriate parameter for this determination. |
| **Round 1 Response from Methodology Developer** | The boundary of the project is the census of all planting units |
| **Aster Global Findings - Round 2** | Pending Finding 42. |
| **Aster Global Findings - Round 3** | The assessment team has closed relevant findings pertaining to the census based approach, upon which this item was pending. Item closed. |

| **Item Number** | 176 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Applicability |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 6: Baseline |

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| **Aster Global Round 1 Findings** | This section is very light on details, especially when it comes to the census-based accounting approach, as that does not have an accompanying appendix to point to. In the performance benchmark appendix, it states (though not explicitly in the applicability conditions) that the baseline will need to be updated every 5 years - a current conservative variation to the VCS allowances. However, there is no mention of the baseline needing to be updated within a certain timeframe within this section, especially in the census-based approach.<br><br>Notably, the VCS Methodology Requirements Section 3.10 is missing explicit baseline requirements for ARR methodologies (all other AFOLU types were depicted in this section). An email was sent to Verra on 22 September 2022 pointing this out. Please note this could yield additional Findings on more specificity being included in the baseline section. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | The baseline would be reassessed at every verification for the area-based approach, which must be done at least every five years. The census based approach allows for a 0 baseline that would be static for the life of the project. |
| **Aster Global Findings - Round 2** | The clarification provided is sufficient to close the identified finding. |

| **Item Number** | 177 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Project Emissions |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Section 8 |
| **Aster Global Round 1 Findings** | The assessment team was unable to locate methods for accounting for burnt CO2, in line with included GHG sources. |
| **Round 1 NCR/CL/OFI** | NCR: Please ensure computational methods are provided for CO2 emissions from burning in line with included GHG sources. |
| **Round 1 Response from Methodology Developer** | CO2 emissions are accounted via stock change calculated from remeasurements. |
| **Aster Global Findings - Round 2** | The clarification and edits made are sufficient to close this finding. Item closed. |

| **Item Number** | 178 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Methodology |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The assessment team noted that the text as written is inaccurate for a number of sections. |
| **Round 1 NCR/CL/OFI** | CL: Please correct text to be in line with computational methods. |
| **Round 1 Response from Methodology Developer** | Will be addressed in technical edit. |
| **Aster Global Findings - Round 2** | Pending other items pertaining the necessity of the technical edit. |
| **Aster Global Findings - Round 3** | The technical edits made are sufficient to close this item, noting that a final technical edit will be conducted by Verra. |

| **Item Number** | 179 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Biomass Burning |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The methodology outlines that burning for tree biomass is to be accounted for, however, equations include non-tree biomass elements. It is unclear why this is applied this way. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | If these are included pools they need to be accounted. |
| **Aster Global Findings - Round 2** | Thank you for the clarification. Table 3 now includes "burning of biomass" rather than "burning of tree biomass". Item closed. |

| **Item Number** | 179.1 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Biomass Burning |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |

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| **Aster Global Findings - Round 2** | it is unclear why eq. 27 uses N initial population size. e.g. if 100 propagules were planted at time 0 but the fire occurs at year 5 and not all propagules have survived to year 5, would use of N overestimate the Bwp,t? |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings |
| **Round 2 Response from Methodology Developer** | N (without a 1-Mt correction) is the correct value in this equation, because nt is a sample from the initial census N, so nburn/nt yields the percent of N burned. E.g. if initial N = 100, and at time t only 50 survive, and of those 25 are burned, a sample of the original list of 100 would yield nburn/nt of 25%, * 100 (N) = 25, which is correct. |
| **Aster Global Findings - Round 3** | The clarification provided is sufficient to close the identified finding. Item closed. |

| **Item Number** | 180 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Biomass Burning |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | The methodology justification for burning biomass speaks to anthropogenic, planned causes for burning. It is unclear whether the methodology accounts for unplanned burning events as written. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | It would apply both instances regardless of natural or anthropogenic causes. |
| **Aster Global Findings - Round 2** | Thank you for the clarification. However, this is not made clear anywhere in the methodology, notably Table 3. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | In table 3 have clarified biomass burning as (whether by natural or anthropogenic causes) |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 181 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.2 |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | It is unclear how shrubs are accounted for in this section, as the parameters used in calculation do not provided information for inclusion of shrubs. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Removed from the methodology |
| **Aster Global Findings - Round 2** | Section 8.2.2 still includes references to shrubs, including in the Section title. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Woody biomass now only categorically defined in definitions. Confusing instances of "woody biomass (trees and shrubs)" removed. |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 182 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | Section 8.2.2 of the methodology states "Where estimations are applied for different tree and/or shrub species, the sum across all the tree and/or shrub species must be calculated." It is unclear how this is appropriate as relevant equations do not include the notation for doing so. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Removed from the methodology |
| **Aster Global Findings - Round 2** | Section 8.2.2 still includes references to shrubs, including in the Section title. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 2 Response from Methodology Developer** | Woody biomass now only categorically defined in definitions. Confusing instances of "woody biomass (trees and shrubs)" removed. |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| Item Number | 183 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Section 8.2.2 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | Section 8.2.2 of the methodology states "Section 8.5 provides procedures for the accounting of tree harvesting." However, mention of this is only in the "area based quantification" approach section. It is unclear how this is appropriate, as HWP are also included in the census based approach. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| Aster Global Findings - Round 2 | HWP being dropped from the methodology is sufficient to close this finding. Item closed. |

| Item Number | 184 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Section 8.2.2 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | Section 8.2.2 of the methodology states "The change in carbon stock in woody biomass is estimated using the stock difference method." However, this statement is not elaborated on. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | The text in section 8.2.2 following the description of the stock difference method elaborates how this is done. "Any pre-existing woody biomass is also measured and included in the above and below ground biomass estimates; stock change accounted in the with-project scenario subtracts initial t=0 stocks estimated immediately prior to initiation of the project activity. Any removals of pre-existing woody biomass as part of the project activity (e.g. due to site preparation) are accounted by calculating stock change referencing initial t=0 stocks." |
| Aster Global Findings - Round 2 | The clarification is sufficient to close this finding. Item closed. |

| Item Number | 185 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | Section 8.2.2 of the methodology states "Any pre-existing woody biomass is also measured and included in the above and below ground biomass estimates; stock change accounted in the with-project scenario subtracts initial t=0 stocks estimated immediately prior to initiation of the project activity. "However, no guidance for measurement nor inclusion are provided within the methodology. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Any pre-existing stocks are accounted as Cwp-woody at time t=0, to which all stock change calculations are benchmarked. |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| **Item Number** | 186 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | Section 8.2.2 of the methodology states "Any removals of pre-existing woody biomass as part of the project activity (e.g. due to site preparation) are accounted by calculating stock change referencing initial t=0 stocks. Initial woody biomass stocks may be assumed to equal to zero if canopy cover of woody trees and shrubs, averaged across the project area, is less than 5% at t=0, assessed using aerial photographs or high resolution (<= 5 meters) satellite imagery."<br><br>See finding above regarding lack of guidance for measurement/inclusion.<br><br>It is unclear if pre-existing and initial woody biomass as described in this section refer to the same thing.<br><br>It is unclear to the assessment team how the application of assuming the removal of stocks ;less than 5% is equivalent to zero is sound and in line with the requirements of the project being additional and the credits being determined to be real, as the project could potentially get credits for the reduction of carbon stocks. |

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| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Any pre-existing stocks are accounted as Cwp-woody at time t=0, to which all stock change calculations are benchmarked. Referenced text now clarifies that "initial t=0" is equivalent to "pre-existing" The previous allowance for assuming zero t=0 stocks where pre-existing canopy cover <5% has been removed (would not provide a valid de minimis demonstration where <5% canopy cover = significant component of stock change, e.g. where single large trees have been retained in pasture). |
| **Aster Global Findings - Round 2** | The assessment team notes that all pre-existing woody biomass (i.e., at t=0) must now be measured and accounted when using the area-basis. This finding is closed. |

| **Item Number** | 187 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |
| **Aster Global Round 1 Findings** | Section 8.2.2 of the methodology states: "Any deliberate vegetative propagation from original planting material must be accounted in a new cohort of planting units j, subject to complete census to produce a new parameter, Ni." It is unclear how this is appropriate, as Ni is already a defined parameter. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | Removed from the methodology |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| **Item Number** | 188 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Methodology |

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| **Aster Global Round 1 Findings** | Section 8.2.2 of the methodology states: "Any deliberate vegetative propagation from original planting material must be accounted in a new cohort of planting units j, subject to complete census to produce a new parameter, Ni. New planting units attributable to vegetative propagation sourced from existing planting units must be identified based on:<br>a) being of the same species,<br>b) proximity to an existing planting unit (within 1 km), and<br>c) attestation from a project participant."<br><br>1. It is unclear how Ni is to be determined in line with the above text. It is unclear if the intention is for this to be monitored over time, if so it is unclear how Ni is appropriate, as it is determined at validation.<br><br>2. It is unclear how cohort j is utilized, as it does not appear in census based calculations.<br><br>3. It is unclear how new planting units are derived from existing planting units as the methodology defines the initial population as determined at the project start, in line with non-monitored N.<br><br>4. It is unclear how a, b, and c defined above are to be applied. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings 1-4. |
| **Round 1 Response from Methodology Developer** | Removed from the methodology |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| Item Number | 189 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 8.2.4 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Harvested Wood Products. |
| **Aster Global Round 1 Findings** | The methodology applies factors derived from Winjum et al. 1998. It is unclear whether the text is still appropriate in 2022 as new milling technologies have advanced. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings 1-4. |
| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in long-term wood products. |
| **Aster Global Findings - Round 2** | HWP being dropped from the methodology is sufficient to close this fining. Item closed. |

| Item Number | 190 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Section 8.2.6 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | Section 8.2.6 identifies two methods for estimating carbon stock in litter. However, no clear indication is provided regarding which approach is preferable. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | Default approach for litter now removed - must be direct-measured. |
| Aster Global Findings - Round 2 | The clarification and edits made are sufficient to close this finding. Item closed. |

| Item Number | 191 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Section 9.3 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Methodology |
| Aster Global Round 1 Findings | Section 9.3 of the methodology states that the specification of the quantification approach must be defined and states "area based or census based". It is unclear how this language is appropriate, as the methodology elsewhere states that a combination of the approaches can be used. |
| Round 1 NCR/CL/OFI | CL: Please address assessor findings. |
| Round 1 Response from Methodology Developer | Both approaches are covered by the methodology. A project activity may only use one or the other (area or census). Multiple activities may occur in a single project. |
| Aster Global Findings - Round 2 | Section 9.3 does not include information regarding how projects with multiple project activities are to incorporate multiple project activities into the creation of the monitoring plan. |
| Round 2: NCR/CL/OFINCR/CL/OFI | CL: Please clarify how multiple project activities are to be incorporated into the creation of the monitoring plan. |
| Round 2 Response from Methodology Developer | We have added the following text to Section 9.3: "Where area-based and census-based quantification approaches are used on the same project, the monitoring plan will specify the spatial accounting boundary for the area-based approach, and demonstrate non-overlap with the census-based approach (applying area specifications detailed in Section 5)." |

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| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 192 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section 9.3 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | |
| **Aster Global Round 1 Findings** | Section 9.3 of the methodology states that planting units must be clearly defined if using the census-based approach. However, specifics on how to "clearly define" the planting unit are not provided. |
| **Round 1 NCR/CL/OFI** | OFI: Please consider including more information on how a project proponent is to "clearly define" a planting unit. |
| **Round 1 Response from Methodology Developer** | How projects define planting units is intentionally left non-prescriptive, but the requirement in its current form demands that projects establish definitions up front (in the same way that dbh definitions are established in SOPs). E.g. a bamboo project could define a clump or culm as a planting unit. Section 9.3. already specifies: "If using the census-based approach, clearly define the planting unit". |
| **Aster Global Findings - Round 2** | Thank you for the clarification. As the finding was an OFI, no action is required. |

| **Item Number** | 193 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | **Appendix A: Performance Method** Section: Performance Benchmark |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The assessment team reviewed Appendix A and determined that it lacks sufficient details necessary to enable methodology users to effectively derive the performance benchmark. Necessary information, equations, and definitions of parameters are not included in the Appendix, leading to gaps in information and processes that would be required for the performance benchmark to be effectively derived. These issues are noted in additional Findings regarding the Performance Benchmark, but these other Findings should not be considered all-inclusive of potential issues, as the assessor's main issue is summarized here. |
| **Round 1 NCR/CL/OFI** | CL: Please revise Appendix A in line with assessor findings to ensure consistent application of the Appendix in deriving the performance benchmark by methodology users. |

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| **Round 1 Response from Methodology Developer** | The Appendix has been revised and expanded extensively to provide better clarity on stepwise procedures, necessary equations and parameter (requirements around Stocking Index). Content in Appendix A specifying procedures for deriving the performance benchmark is consistent in detail with similar section in VM45. |
| **Aster Global Findings - Round 2** | The revisions made are sufficient to close the identified findings. |

| **Item Number** | 194 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section: Performance Benchmark |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Applicability Conditions |
| **Aster Global Round 1 Findings** | The applicability conditions should include the requirement for monitoring intervals, to be more clear. |
| **Round 1 NCR/CL/OFI** | CL: Please address assessor findings. |
| **Round 1 Response from Methodology Developer** | In Appendix A: Applicability Conditions add a third condition. • The performance benchmark must be updated at the time of each verification or every five years, whichever is comes first. |
| **Aster Global Findings - Round 2** | The assessment team notes a monitoring interval is now listed. |

| **Item Number** | 195 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section: Performance Benchmark |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The section states “Methodology Equation 37 applies the performance benchmark for the crediting baseline”. It is unclear to the assessment team how this reference is even relevant given that "Equation 37" does not exist in the ARR methodology.<br><br>The section states “Methodology Equation A4 derives the performance benchmark for both demonstration of additionality and the crediting baseline”. However, the assessment team noted that equation A4 estimates weight of remotely-sensed project plot. Clarification is requested as to why such discrepancy exists. |

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| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the findings. |
| **Round 1 Response from Methodology Developer** | Equation numbering and references to be updated in final version of methodology. |
| **Aster Global Findings - Round 2** | Equations are now consistently numbered within the Appendix A |

| **Item Number** | 196 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | APPENDIX A: PERFORMANCE METHOD/Performance Benchmark, Section 9.2 Data and Parameters Monitored (CWP-woody-AB,t) |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method, ARR Methodology |
| **Aster Global Round 1 Findings** | The Appendix A: Performance Method states "Accounting of emission reductions and removals is treated in Section 8 Quantification of GHG Emission Reductions and Removals, and is dependent on direct field measurement." However, the assessment team noted Section 9.2 (CWP-woody-AB,t) of the ARR Methodology states "Plot-based sampling approaches (using area-based quantification) may be augmented using double or 2-phase sampling approaches combining limited direct plot-based field measurements with wall-to-wall remote sensing metrics to eliminate sample error (and replace with model error)." The assessment team is unclear about the appropriateness of this disparity. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the assessor findings. |
| **Round 1 Response from Methodology Developer** | Statement in Appendix "Accounting of emission reductions and removals is treated in Section 8 Quantification of GHG Emission Reductions and Removals, and is dependent on direct field measurement" is accurate. The referenced parameter table states that field measurements "may be augmented with" not *replaced by*. The allowance for 2-phase sampling is still dependent on direct field measurement. Guidance on 2-phase sampling (e.g. 3P, not to be confused with estimated derived from remote-sensing alone) has been clarified. |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| **Item Number** | 197 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 2.2 Evaluate remotely-sensed control plots |

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| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The assessment team noted "These polygons represent prospective remotely-sensed control plots. For example, remotely-sensed control plots may be represented by individual pixels or aggregates of pixels defined using segmenting tools in GIS." The assessment team is unclear about the criteria for aggregating individual pixels. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the assessor findings. |
| **Round 1 Response from Methodology Developer** | Text clarified to: "Divide the entire project area into polygons of from 0.09 hectares (30x30 m) to 10 hectares in area. Polygons must be of equal size and must be >=75% within the project area boundary. Remotely-sensed project plots may be represented by individual pixels or aggregates of pixels." |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| **Item Number** | 198 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | 2.2 Evaluate remotely-sensed control plots |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The assessment team noted "Similarly, divide the entire project area into aggregates of pixels of comparable scale to the remotely-sensed control plots, and select a representative sample of remotely-sensed project plots (via random or systematic, stratified or un-stratified sampling)." The assessment team is unclear of the basis of comparison in this. It is also unclear how the sample size for remotely sensed project plots is determined. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the assessor findings. |
| **Round 1 Response from Methodology Developer** | Remotely-sensed project and control plots must now be of equal size. New requirement inserted: "Divide the entire project area into polygons of from 0.09 hectares (30x30 m) to 10 hectares in area. Polygons must be of equal size and must be >=75% within the project area boundary. Remotely-sensed project plots may be represented by individual pixels or aggregates of pixels." Minimum sample size is specified as n=30. |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| **Item Number** | 199 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Section: Performance Benchmark<br>Step 2 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The assessment team noted that the terms "virtual control plots" and "remotely sensed control plots" are used interchangeably. The same goes for "virtual project plots" and "remotely sensed project plots". Clarification is requested as to how the terms used are appropriate and consistent. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the findings. |
| **Round 1 Response from Methodology Developer** | All instances of "virtual" now replaced with "remotely-sensed." |
| **Aster Global Findings - Round 2** | The editing is sufficient to close this finding. Item closed. |

| **Item Number** | 200 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Table 1<br>Factor: Outside any registered AFOLU project |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The section in Table 1 states "Optionally, and as available, the donor pool area will exclude boundaries of any AFOLU projects registered under a carbon offset program". Similar statement is noted in Step 3 (b) as "within the boundaries of any AFOLU projects registered under a carbon offset program (optional)". It is unclear to the assessment team why it is identified "optional". It is unclear to the assessment team how it is appropriate other carbon offset program to be included in donor pool area. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the findings. |
| **Round 1 Response from Methodology Developer** | Inclusion of AFOLU projects would likely penalize projects by selecting controls where carbon finance is driving increases in SI. However, in absence of a database of all shapefiles of AFOLU projects It may not be possible to exclude areas enrolled in a carbon project, therefore it should not be required. |
| **Aster Global Findings - Round 2** | The clarification is sufficient to close this finding. Item closed. |

| **Item Number** | 201 |
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| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Step 2. Select control plots outside of the project area 2.2 Evaluate remotely-sensed control plots |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | Step 2 is labeled "Select control plots outside of the project area." However, the assessment team noted that the section "2.2 Evaluate remotely-sensed control plots" also includes instructions for dividing the project area into remotely-sensed project plots. The assessment team is unclear how it is suitable because the primary title (Step 2) only mentions the methods for selecting control plots outside of the project area. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the findings and include description on “remotely-sensed project plots” under an appropriate section as necessary. |
| **Round 1 Response from Methodology Developer** | Stepwise approach is now clarified. With-project remotely-sensed plots are selected first in Step 1, and then control remotely-sensed plots are selected (delineated) in Step 2.2. |
| **Aster Global Findings - Round 2** | Section 2.2 is still termed "Evaluate remotely-sensed control plots" but asks users to evaluate SI for project plots. |
| **Round 2: NCR/CL/OFINCR/CL/OFI** | CL: Please clarify in line with the findings and include description on “remotely-sensed project plots” under an appropriate section as necessary. |
| **Round 2 Response from Methodology Developer** | Section 2.2. title changed to "Evaluate remotely-sensed project plots" |
| **Aster Global Findings - Round 3** | The changes to the methodology are sufficient to close the identified finding. Item closed. |

| **Item Number** | 202 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Equation A3 and A4 |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | In section of equation A3 and A4 the assessment team noted “where nht: Number of remotely-sensed project plots and matched controls (i) in stratum h with values assessed at time t”. It is not clear to assessment team what controls specify. |
| **Round 1 NCR/CL/OFI** | CL: Please provide clarification in accordance with the findings and make sure to keep the wording consistent. |
| **Round 1 Response from Methodology Developer** | Reference to strata (subscript h) now removed. "Controls" now specified as "control plots." |
| **Aster Global Findings - Round 2** | The changes now satisfy this finding and it is closed. |

| Item Number | 203 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Step 3. Monitor remotely-sensed control and project plots |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A: Performance Method |
| Aster Global Round 1 Findings | It is unclear to the assessment team how parameters ΔSIcontrol,t and ΔSIwp,t are calculated. |
| Round 1 NCR/CL/OFI | CL: Please clarify in line with the findings. Please include equations as required. |
| Round 1 Response from Methodology Developer | Step 5 of the Appendix states "calculated as the slope of the weighted linear regression of the accumulated time series of SI values for the respective population of plots" Procedures to calculate weighted least squares regressions are well-established in the statistical literature and need not be repeated in the methodology (and there is precedent in other methodologies, VM7 e.g., referencing regression approaches without providing step by step procedures for deriving slopes). |
| Aster Global Findings - Round 2 | The assessment team finds that standard estimates of sample summary and distribution statistics are well-established and need no further elaboration, following precedence (e.g., VM0042, VM0045) |

| Item Number | 204 |
|---|---|
| VCS Methodology Requirements 22 June 2022, v4.2 (Description) | Step 2. Select control plots outside of the project area. Equation A2 |
| Evidence Used to Assess (Location in Methodology or Supporting Documents) | Appendix A: Performance Method |
| Aster Global Round 1 Findings | It is unclear to the assessment team how parameters [Mean value of covariate x in the population of remotely-sensed project plots ( $\bar{x}$_wp,x), Mean value of weighted sums of covariate x in the population of matched sets of remotely-sensed control plots ( $\bar{x}$_bsl,x) ,and Standard deviation of covariate x in the population of remotely-sensed project plots (x σwp,x) are calculated. |
| Round 1 NCR/CL/OFI | CL: Please clarify in line with the findings. Please include equations as required. |
| Round 1 Response from Methodology Developer | The mean and standard deviation, referenced in the SDM calculation, are standard statistics that are well-established in the statistical literature and require no further specification in the methodology. |

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| **Aster Global Findings - Round 2** | The assessment team finds that standard estimates of sample summary and distribution statistics are well-established and need no further elaboration, following precedence (e.g., VM0042, VM0045) |

| **Item Number** | 205 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Data and parameters monitored SIscenario,i,t |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | The equations section is labeled A2 in the "Data and parameters monitored" table, and the description states, "Index of carbon stocks in scenario (remotely-sensed control plot j,i or remotely-sensed project plot i at time t". However, the text in Step 1 specifies equation A2 as an equation for determining standard deviation of means (SDM). It is unclear to the assessment team why such discrepancy exists. |
| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the findings and make corrections as necessary. |
| **Round 1 Response from Methodology Developer** | Equation numbering and references to be updated in final version of methodology. |
| **Aster Global Findings - Round 2** | Equations are now consistently numbered within the Appendix A |

| **Item Number** | 206 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | SIscenario,i,t /Data and parameters monitored |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | [Source of data] (Data and parameters monitored) states “SI is an unspecified remote sensing metric with demonstrated correlation with terrestrial carbon stocks (e.g. Normalized Degradation Fraction Index from Landsat imagery, or average canopy height derived from Lidar)”. In [QA/QC procedures to be applied] section it is states “An assessment of percent vegetative cover from aerial imagery may serve as a valid SI”. It's also unclear why the [percent vegetative cover method] is under the QA/QC section. It is unclear whether percent canopy cover is intended to evaluate the SI derived by NDFI or LiDAR canopy height. Given that each of these three methods has a different relationship to biomass, it is unclear which method should be utilized and what the requirements for employing the given methods are. |

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| **Round 1 NCR/CL/OFI** | CL: Please clarify in line with the assessor findings. |
| **Round 1 Response from Methodology Developer** | We have removed detailed discussion of percent vegetative cover (confusingly included under QA/QC). Percent vegetative cover is just one potential index that could meet the requirements for SI, and this is now clarified in the text ("*e.g.* Normalized Difference Fraction Index from Landsat imagery, or average canopy height derived from Lidar, or percent canopy cover interpreted from aerial imagery"). Also, "Normalized Degradation Fraction Index" corrected to "Normalized Difference Fraction Index" |
| **Aster Global Findings - Round 2** | The assessment team notes that the text has been modified to be consistent with Data and Parameters, and also to avoid prescriptive or preferential selection of remote sensing metrics. This finding is closed. |

| **Item Number** | 207 |
|---|---|
| **VCS Methodology Requirements 22 June 2022, v4.2 (Description)** | Data and parameters monitored |
| **Evidence Used to Assess (Location in Methodology or Supporting Documents)** | Appendix A: Performance Method |
| **Aster Global Round 1 Findings** | Multiple parameters identified in Appendix A are not defined in either the Appendix or the text of the methodology. |
| **Round 1 NCR/CL/OFI** | NCR: Please ensure all appropriate parameters are defined in the methodology . |
| **Round 1 Response from Methodology Developer** | Methodology has been reviewed to ensure all parameters are defined |
| **Aster Global Findings - Round 2** | The assessment team notes all necessary parameters have been defined. |

# APPENDIX C: PUBLIC COMMENTS ASSESSMENT

| **Comment Number** | 1 |
|---|---|
| **Commenter** | Caio Gallego |
| **Organization** | Biofilica |
| **Date Received** | 1/28/2022 |
| **Public Comment** | The methodology allows for two quantification approaches: an area-based and a census-based, with regard to the applicability of the census-based approach, the project activity may not result in land use and land cover change. We would like to request if there are defined criteria to identify and quantify land use and land cover change in the projects, and if applicable, we would like to request the criteria. |
| **Response from Methodology Developer** | The requirement only specifies no change in "land use", thus no land cover definitions are needed. We have added clarity on "land use" referrring to the 6 IPCC "land use categories" (forest land, cropland, grassland, wetland, settlements and other land). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for defined criteria to ID LULC change. The developer stated no definition of LULC was needed. However, they did not ask for a definition of LULC but defined "criteria to identify" LULC. |
| **Aster Global Initial Findings** | CL: Please explain where and how criteria to ID LULC change is located in the methodology, to address the original comment. |
| **Round 1 Response from Methodology Developer** | Condition regarding LULC change now removed |
| **Aster Global Round 2 Findings** | The referenced condition regarding LULC change is still included in the methodology. It is unclear how this comment has been addressed. |
| **Aster Global Round 2 NCR/CL/OFI** | CL: Please explain where and how criteria to identify LULC change is located in the methodology, to address the original comment. |
| **Round 2 Response from Methodology Developer** | The condition re LULC change was previously included in Table 1 as an applicability condition for the census-based approach. It is no longer included (or relevant). |
| **Aster Global Round 3 Findings** | The clarification provided is sufficient to close the identified finding. |

| **Comment Number** | 2 |
|---|---|
| **Commenter** | Caio Gallego |
| **Organization** | Biofilica |
| **Date Received** | 1/28/22 |

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| **Public Comment** | When choosing the area-based quantification approach, it is necessary to use the performance benchmark to define the project baseline as well as its additionality. In order to be possible, the observed rate of increase in vegetative stock on the control plots, when compared to the project area, must have the same characteristics. Despite a good explanation in the Verra Webinar, these characteristics are not well defined in the methodology, which may in the future generate misinterpretations by developers and generate methodological divergences between ARR projects around the world. Thus, it is plausible that Verra could include a greater and better delineation of the characteristics that should be taken into account. |
| **Response from Methodology Developer** | The criteria to define matches between controls and project area are defined in detail in the methodology appendix (performance benchmark). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Pending closure of relevant findings issued by the assessment team. |
| **Aster Global Round 4 Findings** | Relevant findings related to Appendix A have been closed. Consequently, this finding is closed and the Methodology developers have addressed their commenter. |

| **Comment Number** | 3 |
|---|---|
| **Commenter** | Caio Gallego |
| **Organization** | Biofilica |
| **Date Received** | 1/28/22 |
| **Public Comment** | The proposed methodology makes no reference to the guidelines applicable to grouped projects in the first instance. Even though there are no significant differences in the use of the methodology, we emphasize the fact that, at the very least, a guideline should be included on how to use it in grouped projects. |
| **Response from Methodology Developer** | Guidance is provided in the appendix to specify how the performance benchmark is developed for grouped projects. Otherwise, the operation of the methodology is identical for grouped projects and no further mention is made nor is needed (following precedent on other VCS methodologies). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted that the proposed methodology does not include guidelines applicable to grouped projects in the first instance. The developer took due account by noting that the performance benchmark includes guidance for grouped projects. Further, the developer noted that the operation of the methodology is identical for grouped projects and appropriately noted that no further mention is needed, as grouped project requirements are covered in other VCS guidance and similar to other VCS methodologies. |

| **Comment Number** | 4 |
|---|---|
| **Commenter** | Leon-Jacques Theron |

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|---|---|
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 2 |
| **Page** | 6 |
| **Public Comment** | Section 2 states that, “The performance benchmark is calculated from ex-ante observations of business-as-usual transitions from non-forest to forest cover in areas comparable to the project area.” Based on the of the PB in Section 6 (p. 11) [AB1] and Appendix 1 as “the businessas-usual rate of establishment of new vegetative cover and productivity relative to the project” and the description provided in the webinar, PB not only includes non-forest to forest transitions but also includes non-forest vegetation dominated land cover transitions AND increases in “vegetation stock” (i.e., biomass). The text in Section 2 should be changed to reflect this and avoid confusion |
| **Response from Methodology Developer** | Text in Section 2 amended. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted confusing text between the summary description and appendix of the methodology. The developer took due account of the comment and amended the text to state "The performance benchmark is calculated from ex-ante observations of business-as-usual expansion of new vegetative cover in areas comparable to the project area. Provisions are also made available for a simplified “zero” performance benchmark where initial conditions clearly preclude the establishment of vegetative cover." The new language does not limit to forest cover but now also appropriately includes vegetative cover. |

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| **Comment Number** | 5 |
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 2 |
| **Page** | 6 |
| **Public Comment** | What about baselines that are not agroforestry, but small-scale subsistence agriculture and the baseline is an annual crop. The project is agroforestry or small woodlots that will be difficult to measure with traditional plots, can this also be considered for the census approach? |
| **Response from Methodology Developer** | yes. this is exactly the kind of activity the census-based approach was designed to accommodate. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about small-scale subsistence agriculture on small woodlots difficult to measure with traditional plots. The developer took due account of the comment and noted that is exactly why they have included the census-based approach. No further changes to the methodology were required. |

| Comment Number | 6 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 2 |
| **Page** | 6 |
| **Public Comment** | Why make the area based and census-based approach mutually exclusive? The same project may plant scattered trees and woodlots, is it possible to allow projects to use both and account for carbon using each approach and then combining? |
| **Response from Methodology Developer** | good point. Methodology amended to allow combining approaches in geographically-separate areas. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked why the two approaches were mutually exclusive. The developer took due account and agreed with the comment and revised the methodology. Section 4 now states "One or the other approach, or a combination of the two approaches, may be used, provided approach-specific applicability conditions are met." The assessor notes the action taken by the developer is appropriate. |

| Comment Number | 7 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 4 |
| **Page** | 8 |
| **Public Comment** | Is the methodology applicable in situations where the baseline is degraded forest or only where the baseline has already changed to non-forest? Would this fall under regeneration? If the latter only it will exclude large numbers of initiatives to restore degraded forests and they will be forced to apply REDD methodologies which are not a good fit for ARR. Please clarify |
| **Response from Methodology Developer** | you'll notice that the methodology deliberately does not reference a forest definition, and this allows for accounting just the scenario you describe. Many areas were ARR activities will be directed may already meet a national forest definition (especially those countries where minimum canopy cover is set to 10%). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for clarification on forest definition to see if degraded areas would also be allowed. The developer addressed the comment by noting forest was specifically not defined in the methodology to allow for this greater application to degraded areas. No change to the methodology was required, which the assessor notes is appropriate. |

| Comment Number | 8 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 4 |
| **Page** | 8 |
| **Public Comment** | The definition of wetland combined with organic soils is confusing. Some project proponents only consider wetlands as areas with organic soils. It is important that the definition of wetland must be explained better to remove any ambiguities. The intention is to stop planting of trees in all wetland areas, regardless of whether they have organic soils or not.<br>There is a need to provide clarity regarding the above point other than those likely to have occurred under historic natural conditions.<br>1. Are the rules regarding manipulation of the water table only relevant if there are organic soils or wetlands in the project area? Or do the rules regarding water table manipulation apply in all cases?<br>2. Are there any restrictions to reforesting degraded drained wetlands? These areas may provide essential freshwater functions and should be considered as wetland restoration areas rather than for afforestation, which would increase transpiration and potentially exacerbate water issues.<br>3. Regarding manipulation of the water table and hydrology:<br>a. If project activities were to include fast-growing species known to have higher water consumption than native species, would that constitute "intentional manipulation of hydrology"? Does that depend on the "intention" with which the project activities were implemented, and how would that be assessed?<br>b. What if the species used for project activities had lower water consumption? Would change in the water table need to be monitored, and how would the effects of project activities be isolated from the effects of climate?<br>4. With regard to the definition of "historic natural conditions", which is a term open to broad, subjective interpretation, a clear definition needed for both "historic" and "natural".<br>a. What time frame should be considered as "historic"?<br>b. Does "natural" mean in the absence of humans? Does it mean in the absence of colonization and/or establishment of settler states, where applicable? Does "natural" preclude the use of any introduced species?<br>c. What if an introduced species has become "naturalized" and/or where seed exists in soil seed banks or seed dispersal is likely from existing populations in the region? |

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| **Response from Methodology Developer** | The applicability condition is not meant to "to stop planting of trees in all wetland areas, regardless of whether they have organic soils or not.", it is meant to exclude project activities which increase CO2 and methane emissions from soils (which are not treated). The applicability condition has been clarified to reference the IPCC definition of wetlands. Re excluding ARR activiities that manipulate hydrology by planting e.g. a non-native "naturalized" tree species with high water consumption, the act of planting these species intuitively makes it "deliberate." You can still plant trees on wetlands and use the methodology, but only, as stated, species likely to have occurred under historic natural forest conditions in the project area, ensuring that species used are characteristic of forested wetlands and would not significantly alter site hydrology (whether raising or lowering water tables). Applicability conditions cannot be monitored, so no monitoring is involved, hence the focus of this ex ante evaluation on tree species (not water consumption). The first sentence of the condition is clear - water table manipulation applies in both wetland and/or organic soil cases. WRC activities, which involve deliberate restoration of altered/degraded hydrology are not treated by this methodology (mangrove restoration e.g. would go to VM33). Finally, we should note that this applicability condition has been reviewed, applied and audited extensively under the CDM and American Carbon Registry. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter had questions about the wetland conditions/definition. The developer took due account and clarified the definition of wetland to the IPCC definition. Further, the developer pointed out the definition has been applied and successfully used in other Programs (CDM and ACR). However, it does not appear the developer responded to the questions on "historical" and "natural" and how those terms would be applied between various sites internationally. |
| **Aster Global Initial Findings** | CL: Please explain how the questions on historic and natural wetland conditions were clarified. |
| **Round 1 Response from Methodology Developer** | Reference to "historic" and "natural" removed (admittedly ambiguous). Condition now included new text: "If species planted are other than those naturally occurring in organic soils or wetlands within the same biome (as defined by Olson et al 2001 ) per best available knowledge (relevant literature and/or consultation with local experts), it is assumed that the project activity on organic soils or wetlands results in an intentional manipulation of the water table" |
| **Aster Global Round 2 Findings** | The assessment team determined that removal of the terms "historic" and "natural" paired with the provided explanation is sufficient to close the finding. Item closed. |

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| **Comment Number** | 9 |
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 4 |
| **Page** | 9 |

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| **Public Comment** | There is no mention of no planting of exotic plantations in native ecosystems. Is it possible to expand on the rules of native ecosystems captured in the Standard in this methodology? It is a rule that is interpreted loosely by both proponents and VVBs e.g. only considering forests as native ecosystems or simply arbitrarily classifying an area as “degraded” and then using that as justification that the baseline is not a native ecosystem and then for the exotic plantation ARR activity to go ahead. Also, if ARR is allowed in degraded forests, how will the native ecosystem rule be applied? |
| **Response from Methodology Developer** | Planting of exotic species is not excluded in the methodology, which is solely focused on accounting climate impacts. If ARR happens in a degraded natural forest, the VCS prohibition on clearing native ecosystems (not repeated in the methodology) still applies. Because a natural forest is degraded doesn't mean it ceases to be a natural forest - there is no ambiguity in the VCS rule. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Section 3.2.4 of the VCS Standard states "Activities that convert native ecosystems to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any ARR, ALM, WRC or ACoGS project areas were not cleared of native ecosystems to create GHG credits (e.g., evidence indicating that clearing occurred due to natural disasters such as hurricanes or floods). Such proof is not required where such clearing or conversion took place at least 10 years prior to the proposed project start date. The onus is upon the project proponent to demonstrate this, failing which the project shall not be eligible."<br><br>Section 3.2.5 of the VCS Standard states "Activities that drain native ecosystems or degrade hydrological functions to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any AFOLU project area was not drained or converted to create GHG credits. Such proof is not required where such draining or conversion took place prior to 1 January 2008. The onus is upon the project proponent to demonstrate this, failing which the project shall not be eligible."<br><br>Section 3.17.16 of the VCS Standard states "2) To reduce damage to the ecosystems on which the local stakeholders rely:<br>a) The project shall not introduce any invasive species or allow an invasive species to thrive through project implementation.<br>b) The project shall justify the use of non-native species over native species, explaining the possible adverse effects of non-native species."<br><br>Thus, the developer is correct in asserting there is no ambiguity in the VCS rule. The assessor believes these rules will ensure any exotic plantings will not result in invasive species prevalence. Native ecosystems will be prioritized for ARR activities. |

| **Comment Number** | 10 |
|---|---|
| **Commenter** | Leon-Jacques Theron |

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| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 7, Step 2b, 1) |
| **Page** | 15 |
| **Public Comment** | Must a project demonstrate only one, or all of them (investments institutional). The barriers analysis is quite subjective and it would be quite easy for a project to create a narrative of one barrier and therefore be additional. Suggestion determining some thresholds |
| **Response from Methodology Developer** | Only one barrier must be demonstrated. Quantitative thresholds are included for the investment barrier. Note that this demonstration is only necessary where the performance benchmark is not used - we expect the vast majority of ARR activities at scale to use the performance benchmark. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for clarification on whether only one barrier was required to be proven and stated it would be easy for a project to comply to be additional. The developer stated yes, there is only one barrier required and further stated they expect most projects to use the performance benchmark instead. The assessor agrees that the barrier analysis is in line with barrier analyses required throughout most other methodologies, and no changes to the methodology were needed based on this comment. |

| **Comment Number** | 11 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 7, Step 2b, 1), a, ii |
| **Page** | 16 |
| **Public Comment** | Verra should clarify that i and ii are examples only, and that other financial analysis could be performed. It is not clear what is the threshold so the project activity would be consider additional. |
| **Response from Methodology Developer** | The insertion of "e.g." is clear and will be understood by VVBs. The thresholds are clearly stated, threshold for "ii" is implicitly any value more than zero. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for more clarity on the financial analysis step of the barrier analysis and what threshold would be required. The developer noted the two sub-bullets were examples by the usage of "e.g." and stated a threshold was implicit with sub-step ii. Although the assessor believes the commenter's concern about thresholds not being specified was not addressed, in consulting other barrier analyses from other methodologies, we did not note a threshold. Thus, the assessor does not believe a change to the methodology was required as a result of this comment. |

| **Comment Number** | 12 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |

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|---|---|
| **Date Received** | 1/28/22 |
| **Section** | 7, Step 2b, 2) |
| **Page** | 17 |
| **Public Comment** | Please provide more clarity to ensure the reader understands a combination of evidence must be provided |
| **Response from Methodology Developer** | A combination of evidence is not required. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested more clarity to the barrier analysis, and the developer noted there was none needed. The assessor generally agrees. See previous comments. |

| **Comment Number** | 13 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.2, Area based quantification |
| **Page** | 21 |
| **Public Comment** | If canopy cover is <5% and woody biomass is removed for site preparation, does the removal still have to be quantified and deducted as project emissions? |
| **Response from Methodology Developer** | No. This is clear in the "pre-existing woody biomass" section. If % canopy cover is <5%, it is assumed that pre-existing woody biomass stocks (prior to site prep, which is part of the project activity) are zero. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding whether removal of woody biomass for site preparation needs to be quantified and deducted as project emissions. The developer clarified that this removal does not need to be included as project emissions. However, the assessment team has issued findings regarding this item and thus this item is pending.<br><br>Additional clarifications made to this statement in response to Round 1 findings are sufficient to close this finding. |

| **Comment Number** | 14 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.2, Census based quantification, 1) |
| **Page** | 22 |

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| **Public Comment** | Please provide clarification, the same individual species or group of species planted. could regeneration of different spp as result of the project activities (e.g. fencing) be accounted for? It should if also attested that was result of the project activity (thus the #1 would be invalid) |
| **Response from Methodology Developer** | If a new species is planted "not from the original planting material" (this text important), e.g. live fencing, they would count as new planting units. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification on quantification of regeneration of different species as a result of the project activities. Though the assessor did not find the exact verbiage "not from the original planting material" in Section 8.2.2 of the methodology, the text included in the methodology explains how to account for deliberate vegetative propagation from original planting material. No change was needed in the methodology as a result of the comment. |

| **Comment Number** | 15 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.4 |
| **Page** | 23 |
| **Public Comment** | How does the project proponent demonstrate control and right of use of wood products after they have been sold? Most parameters in this section can vary a lot, considering the uncertainties, more rigour should be introduced for proponents to qualify to claim for HWP such as quantifying wood density for species planted and keeping detailed records of all harvested wood products, particularly considering that the source of emissions factors used dates back to 1998. |
| **Response from Methodology Developer** | See reporting and documentation requirements for parameter Vex in the parameter tables. The PP does not have to maintain ownership or chain of custody of HWP (as an accounted stock they attribute to the area where they were produced/sourced, following VCS methodology precedent). It's a good question re uncertainty around the estimation of longterm residency of C in HWP. We are aware of no other potentially globally applicable studies to reference. The only other alternative would be to exclude HWP from the accounting boundary and assume all extracted volumes are immediately emitted. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted the HWP values should include more rigor and are from 1998. The developer stated they were unaware of any other potentially global studies. The assessor used a search engine to locate the following study, for example: https://pubs.acs.org/doi/10.1021/acs.est.9b05721<br><br>Though this study may be broad, It is unclear if the developer considered it's application (or that of a more recent study) to potentially including more recent values in the methodology. |
| **Aster Global Initial Findings** | CL: Please provide further evidence that more recent, rigorous wood products data applicable to the uses of the methodology does not exist. |

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| **Round 1 Response from Methodology Developer** | Harvested wood products dropped from methodology accounting boundary (conservative) because of noted lack of data on residence time of carbon in longterm wood products. |
| **Aster Global Round 2 Findings** | Removal of harvested wood products is sufficient to close this finding. Item closed. |

| **Comment Number** | 16 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.6, Conservative defaut factor-based method |
| **Page** | 27 |
| **Public Comment** | What about litter in the context of harvesting? After the final harvesting most litter will be a potential source of emissions. Should this pool be considered for projects with harvesting? If litter is removed or lost through activity other than anthropogenic, can litter still be claimed? |
| **Response from Methodology Developer** | In almost all cases litter will be de minimis. If litter were excluded from the accounting boundary, and the ARR activity involves harvesting which results in a loss of forest litter, the project would be failing to report a net zero result (because the litter pool is an addition from the ARR activity). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about litter quantification. The developer provided a response, but it is unclear if the response truly addresses the concern for non-reporting of increased project emissions in the harvesting scenario. |
| **Aster Global Initial Findings** | CL: Please further clarify why not including litter by assuming it is de minimus is actually a conservative assumption when harvesting occurs. |
| **Round 1 Response from Methodology Developer** | If litter is ignored in the accounting boundary, emissions from litter after harvest would also be ignored. However, the litter pool acting as a source in this case was accumulated post t=0 from the growing trees, and so emissions from litter (if complete) would bring this pool back to zero, so a net zero result and not non-conservative. Is the question really about coarse woody debris (which makes more sense in the harvesting context, i.e. logging slash that then becomes a source)? If so, the methodology would not produce a non-conservative outcome - (1) if the lying dead wood pool were excluded, then any harvest is assumed as a complete emission of AGB, and (2) if the lying dead wood pool were included, harvest would result in a sudden input to the pool, and subsequent emissions would be accounted via monitoring. |
| **Aster Global Round 2 Findings** | Since litter is included in the area-based approach, the assessment team believes the original concern has been addressed inherently in the methodology. This item is addressed. |

| **Comment Number** | 17 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |

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|---|---|
| **Date Received** | 1/28/22 |
| **Section** | 8.2.7, Deafult factor-based method |
| **Page** | 28 |
| **Public Comment** | Is there clear evidence that planting trees in unwooded areas always leads to increases in SOC, especially in cases where the baseline and shrub stratum are lost in the with-project scenario. There is conflicting evidence in the literature. Consider excluding the default factor based method. |
| **Response from Methodology Developer** | The dafault factor based method to estimate SOC is removed from the methodology. Therefore, only direct SOC sampling will be accepted |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted planting trees may not always lead to increases in SOC. The developer took due account and removed the allowance of a default factor, only allowing direct soil sampling (see Section 8.2.7). The assessor notes this change was appropriate and will result in real SOC emissions quantifications. |

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| **Comment Number** | 18 |
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.7, Deafult factor-based method, 2) |
| **Page** | 28 |
| **Public Comment** | Provide clear definitions of the land use states described above using terms such as non-native grassland instead of grassland as ARR on native grassland is not allowed. |
| **Response from Methodology Developer** | Text unnecessary and stricken. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted text that could be problematic, and the developer took due account and removed the text. The assessor agrees the removal was appropriate, as the original text was unnecessary. |

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| **Comment Number** | 19 |
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 8.5, Census-based quantification, Accounting for tree harvesting |
| **Page** | 39 |

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| **Public Comment** | Does this mean AFOLU Guidance: Example for Calculating the Long-Term Average Carbon Stock for ARR Projects with Harvesting is no longer applicable? |
| **Response from Methodology Developer** | The long-term average should still be used and applied by project proponents |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for clarification on the accounting for harvesting in the census-based approach. The developer answered the question, and no changes to the methodology were required, noted as appropriate by the assessor. |

| **Comment Number** | 20 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 9.2, CWPwoodyAB,t |
| **Page** | 66 |
| **Public Comment** | Please provide additional guidance as to how this would work. |
| **Response from Methodology Developer** | It's not clear what you're referring to. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for guidance to how a monitored parameter would work, but the developer stated it was not clear to what the comment was referring. Given the findings on the noted parameter, the assessor believes the developer should have at least attempted to respond to the comment in general terms, at the very minimum. |
| **Aster Global Initial Findings** | CL: Please note assessor comments on the parameter "CWP−woody−AB,t" elsewhere in the Findings, and provide a response here that indicates the comment was taken into account. |
| **Round 1 Response from Methodology Developer** | Cwp-woody is monitored via representatively sampled direct field measurements, with estimation of above- and belowground biomass using allometric equations. |
| **Aster Global Round 2 Findings** | The developer provided a response to how Cwp-woody parameter "would work" which is what the commenter has initially requested clarification on. Item closed. |

| **Comment Number** | 21 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 9.2, CWPwoodyAB,t |
| **Page** | 66 |

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| **Public Comment** | aerial photogrammetry can meet requirements to get canopy height in areas with scattered trees. Suggest including as a possibility where the correlation can be proved. |
| **Response from Methodology Developer** | This is allowed under the double sampling approach outlined in the parameter table, provided it meets the specified requirements. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested aerial photogrammetry could allow height estimation, and the developer concurred that would be allowed, noting specific requirements are met. The assessor notes this is sufficient to take into account the comment. |

| **Comment Number** | 22 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 9.2, CWPwoodyAB,t |
| **Page** | 67 |
| **Public Comment** | Does this exclude the use of stand based and other generic allometric equations? In some natural forests with diverse growth forms stand based equations sometimes provide more accurate answers. Can this not be left to the proponent to provide evidence of applicability? |
| **Response from Methodology Developer** | Stand-based yield projections are not allowed. I assume you mean regional or forest type-specific equations like Chave et al. This is a good point, especially in cases where the ARR activity is facilitated natural regeneration and results in a high diversity of tree and shrub species. Have added this allowance for forest type-specific equations. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about stand-based allometric equations. The developer noted stand-based yield projections are not allowed but added an allowance for forest type-specific equations. The assessor notes the developer took due account and amended the methodology to allow for more accurate accounting of natural regeneration. However, it was not noted in the methodology specifically where stand-based projections were disallowed. |
| **Aster Global Initial Findings** | CL: Please clarify where stand-based projections are excluded or disallowed. |

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| **Round 1 Response from Methodology Developer** | Criteria have been elaborated to select appropriate allometric equations: "Aboveground woody biomass of each sampled tree will be estimated using published allometric equations applied to one or more measured tree attributes.<br>For project activities involving facilitated natural regeneration or with more than two species in a single area, equation(s) must be chosen with priority from higher to lower preference, as available, as follows:<br>(a) Ecoregional (ecoregion defined at the realm level ) forest type-specific,<br>(b) Global forest type-specific<br>Otherwise (e.g. in the case of monoculture plantations), equation(s) must be chosen with priority from higher to lower preference, as available, as follows:<br>(a) Ecoregional species-, genus-, family-specific,<br>(b) Global species-, genus-, family-specific<br>Note where global allometric equations are used, equations must have been developed from or validated with datasets including direct measurements collected via destructive sampling from within the same ecoregion as the project." Note especially that projects may conduct site-specific destructive sampling to validate existing published equations. |
| **Aster Global Round 2 Findings** | Methodology developer has made revisions to clarify that allometry will be calculated on an individual woody plant basis rather than using area-based yield tables.<br>The assessment team notes however that the Data and Parameters related to allometry specifically provides guidance for trees and not other woody plant forms. |
| **Aster Global Round 2 NCR/CL/OFI** | OFI: Please clarify how allometry will be applied to non-tree woody plants. |
| **Round 2 Response from Methodology Developer** | Reference to allometrics in parameter tables revised to "woody plant (e.g. tree, shrub)" so not necessarily a tree. |
| **Aster Global Round 3 Findings** | The changes to the methodology are sufficient to close the identified finding. Item closed |

| **Comment Number** | 23 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 9.2 |
| **Page** | 68 |

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| **Public Comment** | Many of these tables describing how parameters should be measured or calculated are open-ended. The “open-endedness” of this methodology is both a strength and a weakness: The pro is that it allows for flexibility and the use of more advanced techniques at the cutting edge of forest measurement and a wide range of data and collection methods tuned to the specific circumstances of each project. The con is that it may result in wildly inconsistent accounting methods between projects and potentially between project accounting and monitoring periods for a single project unless such practices are specifically prohibited. Since accusations and evidence of subjective baselines and inconsistent accounting have been cause for recent critiques of carbon offsetting projects (though they were aimed at REDD projects most recently) and because such concerns have been shown to be warranted in some cases, this methodology needs to critically evaluate how it can maintain flexibility while also retaining scientific rigor and producing consistent carbon accounting between projects. Sources are cited for applying "best practices", but maybe specific guidance should be included on minimum sample size (i.e., number of plots) and connected with uncertainty calculations. |
| **Response from Methodology Developer** | These tables are not meant to be a user manual, nor serve as standard operating procedures. Projects will have to develop these kind of detailed step by steps, as well as sample designs, to guide the collection of field data and ensure that the "bare" requirements in the parameter tables and methodology are met. As you recognize, the tables are deliberately non-prescriptive to allow flexibility and innovation for PPs seeking to improve cost efficiencies, while providing enough requirements to ensure minimization of bias (sample design, QA/QC procedures) and permit proper estimation and accounting of sample error (sample design), namely via these overarching provisions: 1. Be demonstrated to be un-biased and derived from representative sampling<br>2. Accuracy of measurements and procedures is ensured through employment of quality assurance/quality control (QA/QC) procedures (to be determined by the project proponent and outlined in standard operating procedures governing field data collection) |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted both benefits and concerns to leaving the methodology and data and parameters/monitoring open-ended but expressed the methodology should focus on maintaining scientific rigor and consistent carbon accounting between projects....<br><br>The assessment team has issued several findings related to the elements in this comment. This issue will likely be resolved upon the developer's response to assessor findings at final assessment. However, this is marked Pending here to ensure the entirety of the comment gets resolved during the assessment process. |
| **Aster Global Round 4 Findings** | Following closure of all findings related to parameters, the assessment team determines the public comment has been adequately addressed and has closed this finding. |

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| **Comment Number** | 24 |
| **Commenter** | Leon-Jacques Theron |

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| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | 9.2, tC ha |
| **Page** | 86 |
| **Public Comment** | The VCS Standard has recently been revised to use the equivalent volume approach which is more appropriate in situations where soil compaction is changed. Suggest the guidelines are revised in line with Standard. |
| **Response from Methodology Developer** | It's equivalent soil *mass* that's required to avoid confounding results of soil compaction. We now reference the Wendt Hauser 2013 ESM approach in the parameter table for soil remeasurement. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter notes a recent VCS revision regarding soil compaction, and the developer noted it relates to soil mass and not volume but that they revised the parameter table to reference the required approach. The assessor believes this change was sufficient to appropriately address the comment. |

| **Comment Number** | 25 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 1, 1) |
| **Page** | 92 |
| **Public Comment** | Please provide additional information how “political jurisdiction” should be applied |
| **Response from Methodology Developer** | Language has been clarified and expanded, and now aligns roughly with JNR guidance. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for clarification on the definition of political jurisdiction. The developer took due account and revised the criteria to state "The donor pool area will exclude any areas of the jurisdictional boundary (defined above) with presence/absence of any operating government-funded program providing incentives for tree planting that differs from the project area," which they claim lines up with JNR guidance language.<br><br>The assessor questions the use of "program...that differs from the project area." Wouldn't a program that "is similar" to the project area within the same policy environment create a biasing problem for the donor pool of the performance benchmark? |
| **Aster Global Initial Findings** | CL: Please see the Finding and clarify. |
| **Round 1 Response from Methodology Developer** | |

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| **Aster Global Round 2 Findings** | The commenter asked for clarification on the definition of political jurisdiction. The developer took due account and revised the criteria to state "The donor pool area will exclude any areas of the jurisdictional boundary (defined above) with presence/absence of any operating government-funded program providing incentives for tree planting that differs from the project area," which they claim lines up with JNR guidance language.<br><br>The assessor questions the use of "program...that differs from the project area." Wouldn't a program that "is similar" to the project area within the same policy environment create a biasing problem for the donor pool of the performance benchmark? |
| **Aster Global Round 2 NCR/CL/OFI** | CL: Please see the Finding and clarify. |
| **Round 2 Response from Methodology Developer** | Table A1 is clear on the delineation of the jurisdictional boundary: "If the project area is within a subnational jurisdiction either registered under Jurisdictional and Nested REDD+ (JNR) or delineated by the national or subnational government for reporting REDD+ (e.g. delineated as a discrete Forest Reference Emission Level), the relevant jurisdictional boundary is the subnational jurisdiction (not below the second administrative level from the national level). Otherwise, the jurisdictional boundary used is the national boundary." |
| **Aster Global Round 3 Findings** | As the developer addressed the initial comment and took due account by revising the criterion language, and performance benchmark criteria have been addressed in other areas of this assessment, this comment is addressed. |

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| **Comment Number** | 26 |
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 2, Table 5, Factor 'Land Tenure' |
| **Page** | 93 |
| **Public Comment** | Although more precise classification would assist in finding similar areas (e.g. same level of enforcement, budget/resources...), independent analysis could create a totally new set of control points and find different results (e.g. argue that it is not additional). The control points need to be used with a lot of attention. |
| **Response from Methodology Developer** | |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Pending other Findings related to the matching criteria. |
| **Aster Global Round 3 Findings** | As the developer has addressed matching criteria questions in other portions of this assessment, the assessor believes this comment is addressed. |

| **Comment Number** | 27 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 2 |
| **Page** | 93 |
| **Public Comment** | Why a 25% forest definition threshold? Are there no minimum area or height requirements (e.g., for reforestation vs. revegetation)? Are country-specific forest definitions not considered? |
| **Response from Methodology Developer** | These criteria have been removed. There is now no forest definition threshold. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the 25% forest definition threshold and consideration of country-specific definitions. The developer removed the 25% forest definition threshold, which the assessor believes resolves the original comment. The methodology was appropriately revised. |

| **Comment Number** | 28 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 3 |
| **Page** | 93 |
| **Public Comment** | what is the process to resolve different results from method 1 and 2? |
| **Response from Methodology Developer** | There is now only 1 approach, using a remote sensing metric. |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted resolving differences between the two approaches could be problematic. The developer revised the methodology to remove the 2-approach option, only allowing the remote sensing metric. The assessor believes this is appropriate and took due account of the original comment. |

| **Comment Number** | 29 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 3, 1), b |
| **Page** | 94 |
| **Public Comment** | Is “project boundary” the same as “project area”? What is the definition of “project region”? Are there similarity requirements as were applied for control plot selection? Could direct measurements of aboveground biomass come from the project biomass plots within the project area? |
| **Response from Methodology Developer** | Following VCS convention, "project boundary" refers to accounting boundary (which pools/sources are included), and "project area" refers to the project geographic boundary. "Project region" is not used. Similarly requirements governing the selection of control plots are laid out in detail. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the differences between project boundary, area and region. The developer noted the differences are in line with traditional VCS definitions, and no changes to the methodology were needed. |

| **Comment Number** | 30 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 4, Step 4a |
| **Page** | 95 |
| **Public Comment** | Please consider the following scenario and provide clarification, if the control plots result in a greater EVS than project area, is it not going to be additional? In case of projects looking for removals credits from activities that permit or facilitate natural regeneration <Section 4> that use forest guards and patrols to prevent re-conversion of reforested areas and these areas are within control plots, the EVS in control plots may be higher than project. How will this type of project demonstrate additionality? |

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| **Response from Methodology Developer** | If average change in EVS in the control plots exceeds that in the project area, there are not net positive impacts to report and zero credits are accounted. Registered project areas are excluded from selection of control plots. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for clarification on a specific scenario that could occur for the performance benchmark. The developer took due account and explained how the scenario would not result in net positive impacts. The assessor believes they adequately accounted for the comment, and no further changes were needed. |

| **Comment Number** | 31 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 4, Step 4b, 2) |
| **Page** | 96 |
| **Public Comment** | Please clarify - 50 points to estimate the EV and 250 as control plots? Why that many - compared with the 50 points |
| **Response from Methodology Developer** | This approach removed and sample size requirements made explicit for the remote sensing metric approach. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the differing sample sizes between the estimated EV and control plots. The developer took due account and removed the approach that contained this allowance. The assessor believes this was appropriate. |

| **Comment Number** | 32 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 5 |
| **Page** | 96 |
| **Public Comment** | another equation should be added here to explicitly illustrate how the change in EVS is calculated on a plot-by-plot basis |
| **Response from Methodology Developer** | See eq A1 |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for an example of how the change in EVS is calculated on a plot-by-plot basis. The developer took due account and noted Equation A1, which the assessor believes provided the requested example. |

| **Comment Number** | 33 |
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| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 5 |
| **Page** | 97 |
| **Public Comment** | a step may be missing, since there is no explanation or equation as to how to calculate the "increase in average estimated vegetative stocking (EVS) in the project area, in the interval from t = 0 to T". Perhaps it should be step 4c, to "Re-evaluate EVS and calculate cumulative increase in EVS for project area plots". The methodology as currently written only includes the step for calculating dEVS_control and does not include a step for calculating this value: dEVS_WP. In addition, the subscripts here could be incorrect. There should be no I subscript on the change in average EVS in the project area, since i is used to denote the number of the control plot. |
| **Response from Methodology Developer** | Good point. Equation has been expanded to include derivation of average EVS for project area. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Pending other Findings related to the performance benchmark equations. |
| **Aster Global Round 2 Findings** | The assessment team noted the commenter's concern has been addressed since Appendix A has been substantially revised and average annual increase in stocking index is included. |
| **Aster Global Round 2 NCR/CL/OFI** | |
| **Aster Global Round 4 Findings** | All findings related to equations to derive the performance benchmark have been addressed and closed. Consequently, this finding is closed. |

| **Comment Number** | 34 |
|---|---|
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |

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| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 5 |
| **Page** | 97 |
| **Public Comment** | should a new term "j" be defined to denote each project area plot |
| **Response from Methodology Developer** | See revised equation. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The revised equation denotes j as the control plot, compared to the project plot i. This seems to sufficiently address the original comment. |

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| **Comment Number** | 35 |
| **Commenter** | Leon-Jacques Theron |
| **Organization** | Conservation International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1:Performance Benchmark, Performance Benchmark, Procedure to define the performance benchmark, Step 5 |
| **Page** | 97 |

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| **Public Comment** | Calculation of EVS and dEVS in the project area<br>- Though there is an explanation for how the estimated vegetative stock (EVS) is calculated for the “virtual control plots”, it is not entirely clear how EVS is calculated for the project area. This is essential, because this value is used to derive the performance benchmark (PB) in Appendix 1, Step 5, Equation A2. I would assume that the same method chosen for quantifying EVS in Step 3 (e.g., percentage cover, LIDAR-derived canopy height, NDFI) would be applied to the control plots and the project area plots in order for a meaningful comparison of EVS to be made when calculating the PB.<br>- Was the intention of the authors that the same biomass plots established to measure woody biomass in the project area (Section 9.2) be used as the "virtual” project area plots for calculating EVSWP? Therefore, the change in EVS for each plot j (ΔEVSWP,j) plots would averaged to calculate ΔEVSWP? This needs to be clarified in the methodology text. This commentator suggests such an approach because it would (a) allow for comparable data between the project area and control plots when evaluating EVS, and (b) allow for the calculated EVS to later be compared to actual measured changes in biomass in the project area once such data have been collected, allowing for an accuracy assessment of the chosen EVS quantification method and a means of quality control. At the risk of being redundant, another equation should be added here to explicitly illustrate how the change in EVS is calculated on a plot-by-plot basis<br>- Also unclear from the current text: Once established at validation, does the methodology allow project developers to change the EVS quantification method during subsequent evaluations performed every 5 years? Should changes in the method be allowed or possibly required if a different method can be shown to provide a higher accuracy and/or more conservative estimate with regard to the calculation of net GHG benefits?<br>- Finally: Why is **Δ**EVS data averaged across plots? What is the justification for choosing an average over a median or another summary statistic depending on the distribution of **Δ**EVS values? Should multiple statistics be calculated and the one that results in the most conservative GHG benefit be chosen?<br><br>Data comparability requirements<br>There should be requirements to ensure that comparisons between project and control plots and between years are meaningful, i.e., that data are comparable and that data can be reasonable aggregated when calculating annual average change in EVS.<br>- Imagery source and resolution: For remote-sensing metrics, multispectral data should be from the same source (i.e., the same satellite or satellite array, unless harmonization is used, in which case a detailed method should be provided). A minimum acceptable spatial resolution should be established.<br>- Consider phenology and seasonality: The methodology currently suggests that the most recent imagery be used. However, if the project area and surroundings have strong climatic or seasonality (e.g., pronounced wet and dry seasons, pronounced hot and cold seasons that affect vegetation growth) and/or phenologic considerations such as deciduous trees and shrubs and/or seasonal vegetation senescence, the dates of imagery used for quantifying EVS should always be from the same month or season, and climate data (e.g., from public third-party sources or local weather stations, when available) should be used to evaluate. Otherwise, data between years and between plots will not provide meaningful comparison. Where Step 4 requires the “most recent imagery” to be used, it would be better to require the "most recent appropriate imagery accounting for seasonality and phenology" to ensure EVS is measured in a consistent way |

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| | and that data between plots are comparable.<br><br>PERFORMANCE AND ACCURACY OF EVS AND ΔEVS QUANTIFICATION METHODS<br><br>Given the diversity of methods allowed for quantifying EVS, how does the methodology expect to achieve consistency between projects in terms of quantification of net GHG benefits?<br>Though the methodology does not require specific methods for quantifying EVS, it describes three potential types of measurements that could be used: area-based measurements (e.g., percent cover), canopy height measurements (e.g., LIDAR, radar), and spectral-based measurements (e.g., NDFI). Since EVS is being used as a proxy for vegetative stocking (i.e., biomass and, by extension, carbon), it is important that EVS have a statistically significant correlation to biomass and carbon, as should be required by the methodology. However, another important consideration is that each of the three measurement types have distinct relationships to biomass, and that these relationships can also vary by species. Though not an exhaustive list, each of these three measurement types mentioned have distinct pros and cons and introduce different biases that would lead to overestimation or underestimation of biomass change under different circumstances. Some examples are:<br><br>- Percent-cover measurements – Do not capture additional changes to vegetative stock once a stand reaches canopy closure, even though additional biomass growth in overstory trees and understory species will continue to occur.<br>- Height-based measurements – Relationship between tree height and biomass/carbon varies by species, but species composition data will likely not be available for control plots where field data is not collected. This method also ignores above-ground biomass pools and sinks in the understory unless accounted for in another way, such as a ratio factor from literature and/or field measurements.<br>- Spectral methods (optical spectra) (e.g., NDFI) - Methods based in optical imagery are likely to become saturated with respect to a pixel's "greenness" and therefore the estimated fraction of photosynthetic vegetation. These are also affected by short-term climatic fluctuations, phenology, and seasonal changes, which must be accounted for. Furthermore, since understory vegetation is not captured using this method in closed-canopy conditions, there is potentially an underestimate in biomass increase in the understory. Alternatively, increases in photosynthetic vegetation fraction as measured by NDFI could include growth of herbaceous vegetation which have short-term and low levels of above-ground biomass when compared to shrub and tree biomass, thus introducing bias in measurement of biomass change. Souza et al. (2005) highlights the usefulness of the NDFI metric for disturbance including degradation (i.e., biomass/carbon loss), but does not evaluate the accuracy of NDFI in estimating positive change in vegetative stocking (i.e., biomass/carbon gains), which is the measurement that the methodology aims to capture.<br><br>Given the differences in biases between types of measurements and differences in their performance across forest types and no requirement to test their performance, the openness of the methodology leaves room for project developers to potentially manipulate GHG benefit calculations by choosing the EVS quantification method that produces the highest GHG |

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| | benefits.<br><br>Suggestions for improvement<br><br>We recognize that there are trade-offs associated with each method and that in many cases it will not be possible to visit the control sites, which makes a "virtual" plots a necessity. There will also be limitations: differences in data availability and quality and biases in the dates for which data is available due to factors such as cloud cover or uncertainty in dates/seasons of imagery. Therefore, these comments are aimed at addressing these biases and limitations based on the best available scientific evidence Therefore, an important question is: What additional quality controls and safeguards could be added to ensure that EVS accurately reflects not only changes in cover but also changes in "vegetation stock" (i.e., biomass and carbon)? Some suggestions are provided here:<br><br>1. In order the provide rigorous quality controls when using remote-sensing methods, the requirements laid out for remote-sensing estimates of $CWPwoody\ AB,t$ in Section 9.2 could also be applied for the performance benchmark process:<br>- Significant correlation with aboveground biomass pools included in the project boundary, previously substantiated with published studies<br>- Validated with direct measurements of aboveground biomass pools included in the project boundary from the project region (within the national boundary), demonstrating a statistically significant ($p < 0.05$) relationship<br>- Model (ratio or regression) error quantified and assessed in parameter $Up,t$ where $p$ = woody<br><br>Why not apply the same requirements here and provide guidelines for acceptable statistical evidence (e.g., regression types) and equations for calculating error?<br><br>2. Another approach would be to require project developers to test multiple EVS quantification methods (e.g., percent cover AND NDFI) and choose the most accurate or most conservative method.<br><br>For both of these approaches, biomass data collected from the project area plots (or third-party data from the region with similar vegetation) could be used the fit the models and provide this quality control. Since data will be collected to directly measure change in biomass in the project area, this should be compared to calculated **Δ**EVS to show whether it is representative of what is known to be actually happening in the project area. If percent change in the quantified EVS metric is not similar to directly measured biomass change occurring over the same time period, then the method used to quantify EVS is not accurate for this specific context. Therefore, additional steps should be taken or another of the possible acceptable methods for measuring EVS should be tested.<br><br>3. In addition to the aforementioned steps, the methodology could provide a table to suggest which methods of quantifying EVS should be used given the biophysical and vegetation characteristics of the project area and control plots. The most credible and recent data from authoritative or peer-reviewed sources relating biomass to imagery and remote-sensing metrics should be used. |

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| **Response from Methodology Developer** | EVS is the project area is estimated the same way as for the control plots. Direct measurement plot data from the project area are not used for the performance benchmark (and measurable biomass is not typically available on ARR projects until years 5-10). Assessment of EVS in the project area is an independent process. Remember that EVS is not an estimate of biomass used for accounting, and this is deliberate (because the technology is not yet there), it's use is constrained to assessing *ratios* of stock change in control plots *relative* to the project area (from which a simple percent discount is derived). The text has been clarified that the EVS approach must be kept constant through the crediting period (to ensure consistency and eliminate opportunities for gaming), and the same approach must be used for both control plots and the project area. Guidance on the EVS parameter has been expanded to address some of the comments. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about explanation on how stocking index is calculated for the project area. The developer responded by stating stocking index in project area is estimated the same way as for the control plots. The assessor reviewed the Appendix and determined that the developer's response is appropriate, as stated in the Appendix.<br><br>The commenter inquired whether the same biomass plots (direct measurement plots) established to measure woody biomass in the project area are used as the virtual project plots and suggested such approach to be appropriate as it allows for comparison of EVS (stocking index) with actual biomass in the project area and allowing accuracy assessment of the chosen EVS (stocking index) method and a means of quality control. The developer clarified by stating direct measurement plot data from the project area are not used for the performance benchmark and measurable biomass is not typically available on ARR projects until years 5-10. The developer also added EVS (stocking index) is independent of biomass estimation used in net GHG accounting. The assessor confirms the response to be appropriate and revision of Appendix on guidance of EVS (stocking index) addresses this comment.<br><br>The commenter inquired whether change in EVS (stocking index) quantification method is allowing during subsequent evaluation every 5 years. The developer clarified saying EVS (stocking index) method is kept constant throughout the crediting period while using same approach for both project and control plots. The assessor finds the developer's response to be appropriate and also notes this from the Appendix "The same remote sensing metric must be used for monitoring SI ex post in both control plots and project sample plots. Where more accurate remote sensing metrics become available over time, the remote sensing metric used for monitoring SI ex post may be changed, provided that the complete time series (from t=0 through year t) of SI values is replaced (to produce new estimates of ΔSIscenario,i,t)." which addresses the commenter's concern.<br><br>The commenter inquired why the averaging approach was chosen over alternative summary statistics. The developer responded by stating "Guidance on the EVS parameter has been expanded to address some of the comments". However, the assessor noticed that there has been no response to this comment, nor has there been any clarification in the guidance. The assessment team reviewed the referenced document and noted that it does not specifically address the specific concerns identified by |

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| | the commenter.<br><br>The commenter asked about the comparability of project and control plots in consideration of seasonality and phenology. The assessor noted that the revisions made in the updated guidance document adequately address the comment and provide additional instruction.<br><br>The commenter noted multiple EVS (stocking index) quantification methods (NDFI, LiDAR canopy height and Percent vegetative cover) and asked about the requirement on appropriateness of using the given methods. The commenter also recommended the methodology to include a table outlining which approaches to EVS quantification should be employed in light of the project area's biophysical and vegetational features as well as the control plots. However, the assessment team reviewed the referenced document and noted that it does not specifically address the specific concerns identified by the commenter. |
| **Aster Global Initial Findings** | CL: Please provide further information regarding how the specific situations raised by the commenter are addressed by the text of the methodology. |
| **Round 1 Response from Methodology Developer** | The performance benchmark is now derived as the ratio of average annual increment of the control plots to the treatment plot. The average annual value represents the weighted least squares slope of the accumulated time series of stocking indices, from time t=0 to time t. Consideration was given to quantifying the performance benchmark on the basis of a "bookends" approach, referencing only values from time t=0 and time t, but this approach was rejected because it ignores the wealth of data generated across the full time series (that better distinguishes trends). |
| **Aster Global Round 2 Findings** | The developer's response adequately addresses the initial comment identified. Item closed. |

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| **Comment Number** | 36 |
| **Commenter** | Steve Klosterman |
| **Organization** | Earthshot Labs |

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| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 4, Step 4a |
| **Page** | 79 |
| **Public Comment** | If a remote sensing metric is used to pick virtual control plots, as opposed to the percentage cover method, should the +/- 10% requirement be considered a relative percentage range as opposed to absolute range like in the example given for percentage cover? In other words, if the project area has an estimated 50 Mg/ha above ground live biomass from remote sensing, would the +/- 10% acceptable range for a control plot be 45-55 Mg/ha? |
| **Response from Methodology Developer** | This requirement has been removed, and replaced with initial EVS as a matching covariate. Control plots are weighted in proportion to their similarity in initial EVS to the project area. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenters is requesting clarification regarding an approach that has since been removed. This item is addressed. |

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| **Comment Number** | 37 |
| **Commenter** | Steve Klosterman |
| **Organization** | Earthshot Labs |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark |
| **Page** | 75 |
| **Public Comment** | In retrospect this explanation makes sense and the recorded webinar was helpful in confirming my mathematical understanding of equation A2, although initially the presentation of this equation seemed somewhat confusing. It may be helpful to rephrase this quote or add some text, either here or when equation A2 is presented, explaining the meaning of the coefficients. Maybe starting with something like this: “Equation A2 shows how to calculate the performance benchmark as the ratio of average change in EVS over the virtual control plots to the change in EVS in the project area”. Then it may be helpful to rearrange equation A2 to make this intent clearer. The way I’m understanding it, the first coefficient (t) is conceptually linked to the last coefficient (inverse of change in EVS in the project area), and when multiplied together they give the inverse of the rate of change of EVS in the project area. Similarly the middle three coefficients represent the rate of change of EVS averaged over the control plots.<br>It would also be helpful to have some verbal confirmation that the rate of change calculation has two different starting points in time, e.g. 5 years before project start for the control plots and project start for the project area, and a comment on why this is. |

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| **Response from Methodology Developer** | Text added preceding equation to better explain. Approach to performance benchmark has been revised substantially. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The assessment team has found the public commenter's concerns have been addressed because: 1) the equation's accompanying text has been substantially revised; 2) The equation has been modified; and 3) The rate of change calculation for both control plots and project plots are now equivalent. This finding is closed. |

| **Comment Number** | 38 |
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| **Commenter** | Steve Klosterman |
| **Organization** | Earthshot Labs |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 5 |
| **Page** | 80 |
| **Public Comment** | Should the capital T here be lowercase? It seems like this should correspond to “t: Time elapsed since project start date (y) |
| **Response from Methodology Developer** | t is lowercase |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted a potential mis-id'd unit, but the developer clarified it was already lowercase. This appears to sufficiently address the comment. No changes to the methodology were needed. |

| **Comment Number** | 39 |
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| **Commenter** | Marcela Vera |
| **Organization** | Ecotierra |
| **Date Received** | 1/19/22 |
| **Section** | 4, Table 2, Census-based |
| **Page** | 8 |
| **Public Comment** | How it was explained in the PowerPoint presentation, we understood that under this approach, it will be imperative to tag and defined GPS location for each tree, shrub, etc. In agroforestry grouped project with a potential area of 4 000 Ha, it will be a very expensive process. In this case, should we tag each project parcel unit instead of each tree? or should we develop the project under the area-based quantification approach? |
| **Response from Methodology Developer** | No. Areas of this scale should use the area-based approach. |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the difficulties of using the census-based approach for large-scale projects. The developer clarified it would be in the best interest of the project to use the area-based approach in that case. The developer took due account of the comment, and no changes to the methodology were needed. |

| **Comment Number** | 40 |
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| **Commenter** | Marcela Vera |
| **Organization** | Ecotierra |
| **Date Received** | 1/19/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 2 |
| **Page** | 76 |
| **Public Comment** | Should we know the sub-steps (in detail) to delineate the eligible control area? |
| **Response from Methodology Developer** | Steps to define the eligible control area are laid out in detail in the Appendix (Step 2), and guidance has been expanded in the revised appendix. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested more detail on the performance benchmark sub-steps, and the developer added more detail and pointed the commenter to the appendix. The assessor believes this took due account of the comment, and the changes to the appendix to include more detail are warranted. |

| **Comment Number** | 41 |
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| **Commenter** | Marcela Vera |
| **Organization** | Ecotierra |
| **Date Received** | 1/19/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 2 |
| **Page** | 76 |
| **Public Comment** | The PowerPoint presentation is clear about the number of control plots and their size, however; the size of the eligible control area is not specified. What will it be the size of the eligible control area? |
| **Response from Methodology Developer** | There is no minimum required area for the control, only a minimum sample size. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the size of the eligible control area. The developer clarified there is no minimum control area, which sufficiently answered the question posed in the comment. |

| Comment Number | 42 |
|---|---|
| Commenter | Marcela Vera |
| Organization | Ecotierra |
| Date Received | 1/19/22 |
| Section | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 2 |
| Page | 76 |
| Public Comment | For grouped projects, where the eligible area for the project is large, is the control area determined by each instance or by the eligible area? |
| Response from Methodology Developer | This guidance is now clear in the appendix - for grouped projects, each annual cohort will have controls assigned to it. |
| Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate. | The commenter asked a clarification on the how the control area is determined for a grouped project with a large eligible project area. The developer indicated they revised the appendix to be more clear and stated each annual cohort will have [specific] controls assigned to it. The appendix now states "a separate performance benchmark is developed for each annual cohort of instances." This revision to the methodology is appropriate and adequate to sufficiently take due account of the comment. |

| Comment Number | 43 |
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| Commenter | Ronja Knippers |
| Organization | Form International |
| Date Received | 1/28/22 |
| Section | 4 |
| Page | 7 |
| Public Comment | The applicability criteria for this method are few. As such, hypothetical projects that lead to negative consequences for biodiversity and climate could be eligible to claim credits by using the proposed methodology. This could include tree planting on originally non-forest habitats (grasslands, deserts, non-forest land with high albedo) as well as the burning of native trees in favour of tree plantations (with native or non-native species) |
| Response from Methodology Developer | These safeguards are provided in the VCS Standard (which governs the methodology). |
| Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate. | The commenter noted the few applicability criteria could lead to a situation where project developers could use this methodology and also have negative biodiversity and climate impacts. The developer took due account of the comment and noted the overall VCS Standard requirements contain rules that would mitigate/disallow negative impacts from occurring. No changes to the methodology occurred as a result of this comment. |

| Comment Number | 44 |
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| Commenter | Ronja Knippers |

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| **Organization** | Form International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark |
| **Page** | 75 |
| **Public Comment** | For the calculation of the Performance Benchmark, virtual plots in a control area outside of the project area are used. This control area must strictly resemble the project area and must be large, as it must encompass 250+ +/- 1 ha circular plots.<br>For project areas that are atypical for the national context (for example degraded forest that is surrounded by a lot of pristine forest) it may pose a serious challenge to identify a control area. No alternative to the use of a control area is mentioned in the proposed methodology. As such, carbon projects might be excluded from using the proposed methodology. |
| **Response from Methodology Developer** | 250 ha is not large, and we expect few situations where sample size will be an issue. These are virtual control plots drawn from large regional landscapes. Further, many of the matching criteria are not exact, and thus implicitly provide flexibility in sourcing controls. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted it may be a serious challenge for projects with atypical national contexts to locate control plots. The developer responded that they would expect few situations where that would occur, as the plots are drawn from large regional landscapes, and the matching criteria are not exact, providing flexibility. However, the assessor does raise the question of what would projects in those "few situations" do in those cases? |
| **Aster Global Initial Findings** | CL: Please explain what projects would do if they were not able to locate sufficient matching criteria for their control plots. What is their recourse? |
| **Round 1 Response from Methodology Developer** | The Appendix now specifies that if the SDM threshold (=goodness of fit of the match) cannot be met … "the matching steps above are repeated after (a) progressively expanding the radius of the donor pool in 100 km increments, and/or (b) with smaller decreasing the k value, for all remotely-sensed project plots,s until a valid overall match is achieved." However, if data on the required donor pool selection criteria (Table A1) and matching covariates (historic stocking indices) are unavailable, the methodology cannot be applied. |
| **Aster Global Round 2 Findings** | The developer provided an alternative for what projects would do if they are not able to locate sufficient matching criteria. This alternative is feasible, noting that there may still be scenarios in which the methodology cannot be used. Item closed. |

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| **Comment Number** | 45 |
| **Commenter** | Ronja Knippers |
| **Organization** | Form International |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark |
| **Page** | 75 |

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| **Public Comment** | Moreover, the proposed methodology mentions that if land tenure changes or if the control area becomes subject to government-funded tree planting, control plots are no longer valid. However, no mention is made of a situation in which private-funded afforestation or reforestation in the control area starts taking place. This will positively influence the EVS in the control area over time, thereby negatively impacting the amount of credits that can be claimed by the project. The motivation for this choice is currently not elaborated on in the proposed methodology. |
| **Response from Methodology Developer** | If there is private non C-funded reforestation taking place, that is part of the business as usual by definition and should be included in the baseline (and reduce project crediting). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about privately funded afforestation or reforestation in the control plots, and why that would be treated differently than government-funded interventions in the control plots. The developer responded that private ARR would be captured in the baseline analysis.<br><br>However, it is unclear why government-funded programs would not also be captured in the baseline analysis. Further, these control plots are monitored, and there is a requirement for any newly discovered government-funded ARR activities to be removed from the control plots after discovery. At this point, the baseline (in relation to privately funded ARR activities in the control plots) has already been set, so why would these areas (privately funded) not also be excluded here? |
| **Aster Global Initial Findings** | CL: Please address the Finding. |
| **Round 1 Response from Methodology Developer** | If additional information on non-C financed private tree plantings is available, the methodology now allows for incorporation of additional data sources to constrain the selection of controls - "The project may include other spatially explicit, categorical, include additional filtering layers to further refine the eligible control area according to region-specific and culturally-relevant drivers of drivers of carbon regeneration or reforestation, . Any additional factor used to delineate the donor pool area must be provided they are justified on a theoretically sound, or empirically-demonstrated, basis (e.g. peer-reviewed study)." Once matches have been established however, the influence of private non-C financed reforestation is considered part of the business as usual scenario. (Controls only invalidated ex post if policy environment changes or if they become located within a registered AFOLU project). |
| **Aster Global Round 2 Findings** | It is unclear how the response addresses the root concern of why these funding sources are treated differently. |
| **Aster Global Round 2 NCR/CL/OFI** | CL: Please further explain why private versus government funding is treated differently in Appendix 1. |
| **Round 2 Response from Methodology Developer** | Government funding is included as a matching criteria to avoid non-conservative outcomes , e.g. if the project area is within an area where government funding for tree planting is available and implemented, and the project area were matched to areas where that funding was not available, in which case the business as usual conditions are not comparable and the baseline would be low and yield a non-conservative ER result. The current treatment avoids this situation and stands as is. |

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| **Aster Global Round 3 Findings** | The current revision of the methodology appendix states "The project may include other spatially explicit, categorical, drivers of carbon regeneration or reforestation…" which are justifiable in theory or in-fact. Therefore, project proponents can filter the donor pool, optionally via differential sources of private funding, and must filter by similar policy environment. As a consequence, the revisions have alleviated the concern originally raised by the public comment. |

| **Comment Number** | 46 |
|---|---|
| **Commenter** | Ronja Knippers |
| **Organization** | Form International |
| **Date Received** | 1/28/22 |
| **Section** | 7 |
| **Page** | 12 |
| **Public Comment** | In the area-based approach, the additionality is incorporated through the implementation of the performance benchmark. Apart from regulatory surplus, no other aspects of additionality are considered. Due to the limited amount of explanation in the proposed methodology, it remains unclear how it will be safeguarded that projects are additional, i.e. that they could not have taken place without the establishment of the VCU revenue stream. |
| **Response from Methodology Developer** | We have added demonstration of an implementation barrier to the area-based approach as an added safeguard. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commentor requested clarification regarding the determination of additionality when utilizing the performance benchmark. The developer responded by noting that the methodology has been revised to include an implementation barrier aspect for the determination of additionality. Per the Standardized Methods Expert, this comment mixes standardized approaches with CDM principles. In CDM, a project had to demonstrate that the revenue stream was required for the project to proceed, but that is not necessary for standardized methods. It can be in addition to business as usual, but not generate sufficient revenue to even cover costs. The assessment team therefore notes the developer appropriately responded to this comment. |

| **Comment Number** | 47 |
|---|---|
| **Commenter** | Ronja Knippers |
| **Organization** | Form International |
| **Date Received** | 1/28/22 |
| **Section** | 8.4 |
| **Page** | 31 |
| **Public Comment** | The 15% deduction that is applied at the end of the equation warrants some explanation and justification, which is currently not present in the proposed methodology. |
| **Response from Methodology Developer** | This follows the VCS standard and that guidance is not repeated in the methodology. |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding the 15% deduction applied at the end of the equation for uncertainty. The methodology developer clarified that this follows the VCS standard, appropriately addressing the comment. |

| **Comment Number** | 48 |
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| **Commenter** | Vega Tapia Tejedor |
| **Organization** | Fundación Repsol and Sylvestris |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 4 |
| **Page** | 78 |
| **Public Comment** | In general terms, we think that the demonstration of additionality in projects should not prevent them from being carried out due to their complexity or cost. It seems that this methodology is designed for big projects, but smaller projects should also be considered, and we propose to differentiate some requirements regarding the size of the project as we specifically mention below.<br>Step 4: Select and monitor control plots from the eligible control area<br>- We think that the number of control plots is too high (250 or more) and does not consider the size of the project. As an example, we would need more information on how to proceed in the case of small, burned areas (e.g. <200ha). In this case, we would leave too much area outside the project (250 plots of 1ha each) so it would not make much sense.<br>- Moreover, in these small projects, control plot size is significant: 1ha is too big and could be resize according to the project area.<br>- We propose to simplify requirements for control plots based on the surface area of the project. |
| **Response from Methodology Developer** | These are *virtual* control plots that do not need to be owned, managed or visited by the project proponent. The required sample size is not excessive compared to other methodologies, and is needed to provide adequate precision in reporting. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested additional clarification for several items regarding application of the performance benchmark to projects of smaller size. The developer addressed the concern of required amount of sampling by clarifying that control plots are virtual and do not need to be directly measured. Regarding the number of control plots, the developer stated that the required sample size is not excessive compared to other methodologies. It is unclear to the assessment team how this response is appropriate, as it is unclear which methodologies utilize a similar sample size. |
| **Aster Global Initial Findings** | CL: Please clarify which methodologies utilize a similar sample size to justify this response. |

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| **Round 1 Response from Methodology Developer** | The minimum control plot sample size has been removed (and k value to be determined by project proponent). The process to calculate the performance benchmark is dependent on deriving statistically significant differences in slopes, which will drive needed sampling intensity (and allow projects to optimize the amount of data collection conducted). |
| **Aster Global Round 2 Findings** | The developer's response and adjustment to the methodology have sufficiently taken due account of the comment. Item closed. |

| **Comment Number** | 49 |
|---|---|
| **Commenter** | Vega Tapia Tejedor |
| **Organization** | Fundación Repsol and Sylvestris |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1: Performance method, Performance Benchmark, Procedure to define the performance benchmark, Step 4, Table 6 |
| **Page** | 81 |
| **Public Comment** | Step 5: Derive performance benchmark<br>· Table 6 (page 81), It is not clear to us how to make the eligibility of the control plots (t=-5): In page 77 the table says that As the Initial land use/land cover: Non forest/forest classification must be based on remote sensing observations within ±1 year of time $t = -5$ , we see a problem with areas burnt within the 5 previous years of the start of the project. As an example, if we are planning to start a project in an area that was burnt 3 years ago, and we select the control plots in this area, any of them will be eligible because 5 years ago, the Initial EVS (Percentage Canopy Cover) would be at 100% and the project area in t=0 would be at 0%.<br>· We propose some flexibility in time when an event like this occurs, starting the measurement of control plots in the time of the event. |
| **Response from Methodology Developer** | Control plots cannot be within the project area. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding timeframes of establishment of control plots in burnt areas. The developer clarified that control plots cannot be established within the project area, which appropriately addresses the commenters concern. |

| **Comment Number** | 50 |
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| **Commenter** | Florian Reimer |
| **Organization** | Kennemer |
| **Date Received** | 1/22/22 |
| **Public Comment** | 1. Could Verra please clarify if existing CDM A/R methodologies will continue to be applicable for VCS ARR projects or is there a plan to phase them out? |

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| **Response from Methodology Developer** | A final decision has not yet been made. Verra would publish any decision to phase-out the CDM A/R methodology and grace period in a timely manner. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter raised concern regarding the presence of CDM A/R methodology. The developer responded that VERRA will be phasing out the CDM A/R methodology in a timely manner but will provide an appropriate grace period. The assessor notes this response took due account of the comment, and no changes to the methodology were needed. |

| **Comment Number** | 51 |
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| **Commenter** | Florian Reimer |
| **Organization** | Kennemer |
| **Date Received** | 1/22/22 |
| **Section** | 6 |
| **Page** | 11 |
| **Public Comment** | 2. We note that the ARR Methodology section 6 on Baseline does not include "Conditions under which carbon stock and change in carbon stock may be estimated as zero" such as in section 5. of CDM A/R Tool 14. Those might be relevant and useful for areas of evidently high levels of erosion, frequent slash-and-burn cycles and other conditions. These conditions might not be representatively captured by a random sample of visual interpretation plots of e.g. the iTrees tool as their condition might vary considerably on a small-scale of only a few hundred meters. Thus, a delineation of a "eligible control area" as per Appendix 1 Step 2. We suggest that more conditions of section 5. of CDM A/R Tool 14 are incorporated into Step 1 of Appendix 1. |
| **Response from Methodology Developer** | See Step 1 in the Appendix - this sets out circumstances where a zero performance benchmark may be assumed (under "simplified performance benchmark"). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter raised concern over the conditions under which carbon stock and change in carbon stock may be estimated as zero for several specific situations. The commenter responded by stating that pertinent information pertaining to these scenarios can be found in Step 1 of the Appendix. However, the assessment team reviewed the referenced text and noted that it does not specifically address the specific situations identified by the commenter. |
| **Aster Global Initial Findings** | CL: Please provide further information regarding how the specific situations raised by the commenter are addressed by the text of the methodology. |
| **Round 1 Response from Methodology Developer** | We have removed the allowance for a simplified zero baseline on the area-based approach. |
| **Aster Global Round 2 Findings** | Removal of the simplified zero baseline approach would be sufficient to address this comment. However, references to the simplified zero baseline still appear in the methodology. |
| **Aster Global Round 2 NCR/CL/OFI** | CL: Please clarify if the simplified zero baseline approach has been removed from the methodology and make the necessary associated edits. |

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| **Round 2 Response from Methodology Developer** | Reference to a simplified baseline with the area-based approach stricken from Section 2. |
| **Aster Global Round 3 Findings** | The changes to the methodology are sufficient to close the identified finding. Item closed |

| **Comment Number** | 52 |
|---|---|
| **Commenter** | Florian Reimer |
| **Organization** | Kennemer |
| **Date Received** | 1/22/22 |
| **Section** | 7 |
| **Page** | 12 |
| **Public Comment** | 3. Additionality: We notice that the methodology proposes a changed Additionality Demonstration to VT001 "TOOL FOR THE DEMONSTRATION AND ASSESSMENT OF ADDITIONALITY IN VCS AGRICULTURE, FORESTRY AND OTHER LAND USE (AFOLU) PROJECT ACTIVITIES". Verra needs to clarify how the new proposed ARR methodology and VT001 will relate. |
| **Response from Methodology Developer** | The methodology will not use VT001. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about application of VT0001 "TOOL FOR THE DEMONSTRATION AND ASSESSMENT OF ADDITIONALITY IN VCS AGRICULTURE, FORESTRY AND OTHER LAND USE (AFOLU) PROJECT ACTIVITIES" in ARR methodology. The developer noted that the tool is not being utilized in methodology. The assessor notes that this adequately answers the comment.<br><br>Pending below. |
| **Aster Global Initial Findings** | Pending resolution of finding below. |
| **Aster Global Round 3 Findings** | The methodology developer has provided adequate explanation as to why VT001 is not utilized in this methodology, addressing the comment initially raised. Item closed. |

| **Comment Number** | 53 |
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| **Commenter** | Florian Reimer |
| **Organization** | Kennemer |
| **Date Received** | 1/22/22 |
| **Section** | 7 |
| **Page** | 12 |

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| **Public Comment** | 4. Additionality: The new proposed ARR methodology does not include the optional Step 2 Investment Analysis. This option continuous to be important for ARR projects such as VCS Project ID 2412. Especially in the critical context of Agroforestry the Step 2 analysis will be key. While we see some improvements in the Additionality Requirements of the new proposed ARR meth (Regulatory Surplus, also good point Step 2b 1.a) i. "5% of implementation costs" better than previous "no other income" of VT001), we think that also VT001 holds points stronger than the currently proposed version of the new ARR meth (e.g. VT001 Step 2). We there propose that Verra rather update VT001 and incorporates some of the good points into a generally applicable new version of VT001. Performance Benchmark should not be part of the Additionality demonstration. Additionality demonstrations that are methodology specific should be avoided as they lead to "cherry picking". It would be good for VCS AFOLU credibility if Additionality demonstrations remain unified. Thus new proposed ARR meth should refer to VT001. |
| **Response from Methodology Developer** | The current methodology under development will not refer to VT0001 |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter raised concern about the revised version of the methodology no longer referencing VCS VT0001. The commenter responded by stating that the current methodology will no longer refer to VT001. It is unclear to the assessment team how this response addresses the concerns raised by the commenter. |
| **Aster Global Initial Findings** | CL: Please provide additional clarification regarding the concerns identified in this comment. |
| **Round 1 Response from Methodology Developer** | The methodology establishes its own procedures for demonstration of additionality, via application of performance benchmark, financial barrier test (for census-based approach and projects with commercial species, and approach adapted from VT001 tool) and common practice (for census-based approach). |
| **Aster Global Round 2 Findings** | The developer's response describes the procedures for demonstration of additionality as set out by the methodology. However, it is unclear to the assessment team how this response addresses the commenter's initial concern. The VT0001 tool had required elements that were vetted and applicable to a wide range of activities. It is unclear why this tool could not be used. |
| **Aster Global Round 2 NCR/CL/OFI** | CL: Please address the commenter's concerns pertaining to the establishment of methodology specific procedures for determining additionality when compared to VT001. The commenter was specifically concerned about "cherry-picking," and the developer's response did not address that. |

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| **Round 2 Response from Methodology Developer** | VCS Methodology requirements are met re additionality - methodologies may provide their own procedures, provided they meet the required elements. Area-based approach uses a performance benchmark, thus VT0001 is irrelevant (and the area-based accounting applies a financial barrier as an added safeguard that exceeds the VCS methodology requirements). For the census-based approach, VCS additionality requirements are met within the methodology, applying regulatory surplus, a financial barrier and common practice. The latter two approaches are found in VT0001, but the current methodology constrains the barrier to a financial barrier (less subjective than other barriers included in VT0001) and a more standardized, quantitative approach to demonstrate common practice (than the ambiguous guidance in VT0001). |
| **Aster Global Round 3 Findings** | The methodology developer has provided adequate explanation as to why VT001 is not utilized in this methodology, addressing the comment initially raised. Item closed. |

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| **Comment Number** | 54 |
| **Commenter** | Bjorn Brooks |
| **Organization** | Living Carbon |
| **Date Received** | 1/28/22 |
| **Section** | 4 |
| **Page** | 7 |

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| **Public Comment** | Section 4, Applicability Conditions, states the following: "This methodology is not applicable under the following conditions: • Project activities take place on organic soils or wetlands and result in an intentional manipulation of the water table (i.e., the project activity must not involve manipulation of hydrology or otherwise affect hydrology). If species planted are other than those likely to have occurred under historic natural conditions in the project area, per best available knowledge (relevant literature and/or consultation with local experts), it is assumed that the project activity on organic soils or wetlands results in an intentional manipulation of the water table."<br>In particular, the above criterion states that "If species planted are other than those likely to have occurred under historic natural conditions in the project area... it is assumed that the project activity... results in an intentional manipulation of the water table." And therefore a project would be ineligible for consideration under the ARR protocol. The criterion would seem to exclude trees arising from gene editing. This is at odds with our understanding of the motivation for this new methodology development, which was to enhance the inclusion of a broader range of project types, though in its current form the methodology is exclusive of the types of high-quality carbon projects we're working to develop. Contrary to the methodology passage above, some landscapes that are the product of environmental degradation will not readily support the nutrient and soil condition demands of historically endemic species, which would seem to automatically eliminate many potential afforestation project areas in the Eastern United States.<br>As an example of the potential magnitude of carbon projects affected, there are no less than one-half million acres of former mine land throughout the Eastern US, which are sites of prior fossil fuel extraction, and have yet to be reforested. These tracts still exist as unforested landscapes, despite in some cases as many as 4 decades of "recovery". The substrates of abandoned mine lands commonly consist of compacted, nutrient-poor backfill material, with little to no soil development. This typically will not support historically endemic species, as evinced by the lack of trees after decades of time. However other non-endemic species or species that are engineered to have enhanced root growth and high tolerance to toxic metals can grow in these settings and reestablish canopy cover and amend soil conditions over time. It may be important to include options for trees that are the product of gene editing, which is one of few options for reforesting degraded lands that require robust tree stocks in order to restore canopy cover. We would like to ask the protocol authors for more clarity in the passage above and we strongly argue that engineered tree species present a unique opportunity to quickly restore various barren landscapes where endemic species otherwise would not grow. Such projects have not been and are not financially viable without support from programs such as carbon credit projects.<br>We have collected extensive remote sensing, in situ, as well as historical information on land-use development and costs directly from landowners of abandoned mine land in the Eastern US. We would be happy to share this information as evidence that such reforestation projects would not proceed without financial support through programs such as the ARR carbon methodology. |

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| **Response from Methodology Developer** | The methodology does not exclude planting genetically-modified trees on non wetlands and non organic soils. It's reasonable to expect that many genetically-modified trees will have higher water consumption rates (associated with faster growth), and if planted in a wetland environment, would draw down the water table resulting in soil carbon dynamics not captured in the methodology (but potentially captured in VM33). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted the potential exclusion of GMO trees planted in wetlands and how that would exclude projects trying to reforest areas where native, endemic species will not grow due to environmental degradation/contamination. The developer noted GMO trees are not explicitly excluded and that their impact would be captured in other rules related soil carbon loss and non-native species impacts.<br><br>However, the assessor asserts that functionally, the way the applicability exclusion #3 is written, projects planting GMO trees in areas like mine reclamation would never inherently be able to pass the hurdle of the applicability condition, as these [GMO] species would not have likely occurred under historic natural conditions (from a validation perspective).<br><br>This is also pending the comment about WRC being included in the methodology. |
| **Aster Global Initial Findings** | CL: Please address the Finding by clarifying how a project planting GMO species in wetlands could ever pass the applicability condition criteria from a validation/verification perspective. |
| **Round 1 Response from Methodology Developer** | Applicability condition has been revised to "If species planted are other than those naturally occurring in organic soils or wetlands within the same biome (as defined by Olson et al 2001 ) per best available knowledge (relevant literature and/or consultation with local experts), it is assumed that the project activity on organic soils or wetlands results in an intentional manipulation of the water table." In a wetland or organic soil context (unlikely in mine reclamation), it would be assumed that a GMO species (which would be excluded via the applicability condition) would have higher productivity and water consumption and have an impact on soil moisture/water table. Also, we have clarified that the methodology does not apply to WRC activities. |
| **Aster Global Round 2 Findings** | Because reference to WRC activities have been removed from the methodology, the assessor believes this public comment is no longer applicable. The commenter appears to be concerned about the disqualification of potentially beneficial degraded area projects, but the exclusion of these project from the methodology is still conservative, and perhaps a future methodology could be developed to allow these types of activities. This item is addressed. |

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| **Comment Number** | 55 |
| **Commenter** | Dan Harburg |
| **Organization** | Mombak |
| **Date Received** | 1/28/22 |

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| **Public Comment** | 3. Eligibility requirements should only look at the previous 5 years and should prohibit other land uses<br>We believe that the methodology should prohibit the inclusion of lands that (i) are enrolled in reforestation incentive programs, or (ii) have tree canopy on more than 10% of the land area on a per-hectare basis. We also believe the eligibility criteria should meet the following guidelines, in cases where reforestation takes place on land that was previously in agricultural production:<br>a. Land parcels must be in continuous agricultural production for at least 5 years or fallow for 5 years or less. This criterion is based on the assumption that lands with at least 5 years of continuous agricultural would remain active, even as productivity declines through land degradation, for the duration of the project, thereby preventing reforestation. We believe this is a more realistic performance benchmark than the more than 10 years in the current methodology draft. Fallow lands should only be considered for inclusion in the project area if they were in agricultural production for at least 5 years prior to becoming fallow, and have been in fallow for no more than 5 years - which is the maximum period allowed before reclearing is prohibited in Amazon under Brazil's Native Vegetation Protection Law (NVPL) - without significant natural regeneration occurring during the fallow period.<br>b. No alternative financial incentive programs for reforestation are in use. These include government-funded programs and other greenhouse gas (GHG) removal programs. Any landowner that is currently engaged in these programs should not be eligible to enroll in projects. Disincentives (penalties) for failing to reforest areas, however, will not disqualify land, as these are not effective mechanisms for overcoming economic barriers. It is critical to highlight that most, if not all, of the financial incentive programs in Amazon are for forest conservation, and not reforestation, given the importance of preserving lands held in Legal Reserve from being deforested. Put simply, this methodology should focus on areas where reforestation would not occur were it not for the sale of carbon credits. |

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| **Response from Methodology Developer** | Some of these comments reach beyond the methodology and are best addressed by Verra in the VCS Standard's guidance around eligible project activities.<br><br>The methodology deliberately allows inclusion of lands enrolled in reforestation incentive programs. Their baselines must be drawn from areas with similar policy in place, and as well they must show an implementation barrier (e.g. the incentive is insufficient to incentivize the tree planting). Such a project would meet expectations for additionality, and be accounted against an appropriate baseline (with an incentives policy already in place and some levels of adoption/enrollment).<br><br>Appendix 1 of the VCS Standard v4.2 includes the eligible AFOLU project categories and there is no restriction to implement ARR activities in areas that has a canopy cover higher than 10%. Per Section A1.1 of the VCS Standard v4.3 document, "ARR activities are those that increase carbon sequestration and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover (forest or non-forest) through the planting, sowing or human-assisted natural regeneration of woody vegetation."<br><br>Re the 10 yrs demonstration, the bar should be high for allowing the simplified (zero) performance benchmark. 10 years would seem a minimum to confirm recalcitrance of land use. The fallow scenario described would require a 10 yr look back to confirm. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted additional items/detail needed in the eligibility requirements. The developer noted these would be under the purview of other VCS Standard documents. However, the assessment team reviewed these (and existing CDM eligibility conditions, for example) and did not note an area that has a maximum timeline exclusion for project eligibility.<br><br>The developer took due account of other comments related to maximum canopy cover and directed the reader to other VCS rules not explicitly defining this, which the assessor agrees is appropriate (in terms of whether VCS would require a change or not). |
| **Aster Global Initial Findings** | CL: It is unclear how the applicability/eligibility conditions from the methodology and other VCS Program documents ensure project areas have not been cleared of native ecosystems a certain period prior to project implementation. |
| **Round 1 Response from Methodology Developer** | The outstanding comment is related to the simplified zero performance benchmark (Re the 10 yrs demonstration, the bar should be high for allowing the simplified (zero) performance benchmark. 10 years would seem a minimum to confirm recalcitrance of land use. The fallow scenario described would require a 10 yr look back to confirm.). This approach has been eliminated from the methodology. Further, the VVB's comment re no clearing of native ecosystems within a 10 yr timeframe prior to start date is mandated in the VCS rules and need not (and should not) be included/repeated in the methodology. |

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| **Aster Global Round 2 Findings** | Removal of the simplified zero baseline approach would be sufficient to address this comment. However, references to the simplified zero baseline still appear in the methodology. |
| **Aster Global Round 2 NCR/CL/OFI** | CL: Please clarify if the simplified zero baseline approach has been removed from the methodology and make the necessary associated edits. |
| **Round 2 Response from Methodology Developer** | Reference to a simplified baseline with the area-based approach stricken from Section 2. |
| **Aster Global Round 3 Findings** | The changes to the methodology are sufficient to close the identified finding. Item closed |

| **Comment Number** | 56 |
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| **Commenter** | Dan Harburg |
| **Organization** | Mombak |
| **Date Received** | 1/28/22 |
| **Public Comment** | 4. Reassess the baseline every 10 years<br>We support Verra's performance benchmark approach of comparing the increase in vegetative stocking between the project site and control sites. However, we believe that the baseline should be reassessed every 10 years versus every 5 in the draft methodology. Establishing a 10-year timeframe for baseline reassessment generates an accurate and smooth performance benchmark, given the cyclical nature of carbon removal on commercial forests due to harvesting cycles, which can be 7-8 years for eucalyptus plantations. A 10 year reassessment also allows more certainty in the development of projects which will attract more project developers and encourage those developers to create more projects.<br><br>In addition to our recommended changes to the methodology, there are also requirements in the ARR methodology that align closely with Mombak's carbon removal principles. We agree that land parcels should not be included that would otherwise be reforested as a result of regulatory requirements, unless they are held in a Legal Reserve or Permanent Preservation Area and deemed additional. This is because Brazil's NVPL8 regulates that (i) 20-80% of a rural private land parcel must be held in Legal Reserve and (ii) ecologically sensitive areas (such as buffer zones around water bodies, steep slopes and mountaintops) must be held in Permanent Preservation Areas, and maintained as native vegetation. Landowners are technically required to address any deficits through native vegetation recovery or, in the case of land in Legal Reserve, off-setting is also allowed in certain situations. Historical rates of compliance are <10% in the Amazon9, enforcement is very weak, and insufficient funding mechanisms exist at national or local levels to support higher conformity to the law10,11. For many landowners, the transaction, opportunity, and establishment costs associated with achieving compliance are insurmountably large relative to their incomes12. This is consistent with the VCS definition of regulatory surplus, per section 3.5.3 of the VCS Methodology Requirements. Brazil, as a Non-Annex I country, does not systematically enforce compliance with the law, making these practices additional.<br><br>Our vision is to restore native forests and hold them permanently in this state. As such, we would like to encourage mechanisms in Verra's Non-Permanence Risk Tools that will align with this vision and will convince developers and our buyers that these forests are not restored for the |

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| | purposes of clearing the forest with timber harvest following the permanence period. We look forward to future discussions about mechanisms within the Non-Permanence Risk Tools that can provide this level of assurance. |

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| **Response from Methodology Developer** | Currently no differenciation exists between ARR activities that restore native forests and others within the non-permanence risk tool.<br><br>The 5 year re-assessment period reflects JNR and the evolution of thinking on fixed historic baselines. We are exploring instead a purely ex post baseline, which offers the following: • No potential for results to drive the application – better prevents gaming • Better attribution of project results, zeros out externalities (as compared to ex ante, which could, e.g. have a baseline be driven by drought, accounted against an ex post project not subject to drought) • Less complicated accounting and equations (mismatch of timing between baseline and project in current ex ante application creates some confusion and added complexity of equations to align timeframes; i.e. current performance benchmark compares change in the baseline from t=-5 to t=0 to project from t=0 to t=5) • Ex post provides less investment certainty, however, the control plots are now matched in part based on historic change, which we expect to be indicative of future change, thus through methodology application that information is generated which can help inform investment |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The baseline being re-assessed every 5 years is conservative.<br><br>The commenter noted regulatory surplus is not categorically enforced in Brazil, but the methodology's requirement of it is conservative.<br><br>The non-permanence risk tool is outside of the scope of this methodology. |

| **Comment Number** | 57 |
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| **Commenter** | Maria Fernanda Buitrago Acevedo |
| **Organization** | South Pole |
| **Date Received** | 1/28/22 |
| **Public Comment** | Other standards have a standardized excel file for the ER estimations. There are still doubts about the LTA calculation, and there will be for sure doubts about the leakage, and HWP estimations. Perhaps Verra could think about giving an example or a dummy calculation, so there are less questions about these estimations. |
| **Response from Methodology Developer** | We will consider providing examples, but in the long run we are going to be digitalizing our methodologies, which should provide some structure for the types of calculations the stakeholder wants more guidance on. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked for Excel tools to facilitate calculations. The developer took due account but was not required to provide those tools. |

| **Comment Number** | 58 |
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| **Commenter** | Maria Fernanda Buitrago Acevedo |
| **Organization** | South Pole |
| **Date Received** | 1/28/22 |
| **Section** | 9.2 Data and parameters monitored |
| **Page** | |
| **Public Comment** | ¿How is it defined “an appropriate representative sample” for accounting mortality in the census-based approach? |
| **Response from Methodology Developer** | The same as for monitoring, specified as "… a stratified systematic sample, within each annual cohort, selecting planting units systematically with a random start from the list of unique censused planting units" |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter expressed concern regarding sampling to account for mortality in the census based approach. The developer took due account by referencing the text in the methodology that provides information on the sampling to be conducted. However, the assessment team has issued findings pertaining to the sampling approach, thus this item is pending.<br><br>The sampling approach has been deemed to be appropriate through the methodology assessment process. This item is no longer pending and has been closed. |
| **Aster Global Round 4 Findings** | The assessment team has similarly addressed findings related to sampling mortality, as well as accounting for the uncertainty associated with sampling mortality. Following closure of those items, the assessment team determines that the public comment has been adequately addressed. |

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| **Comment Number** | 59 |
| **Commenter** | Maria Fernanda Buitrago Acevedo |
| **Organization** | South Pole |
| **Date Received** | 1/28/22 |
| **Section** | 9 |
| **Page** | 34 |
| **Public Comment** | Document states "Rj : The source of data must be chosen from the following sources, listed in descending order of reference: 1) Detailed data collected using common practices for root sampling in the area 2) Published study specific to project region and vegetation community 3) Global forest type-specific or eco-region-specific value (e.g., from the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry5)" In the previous methodology was suggested to use the Rj calculated with an equation based on the biomass. Is this not required now? RSR equation: R=e^(-1,085+0,9256*lnB)/B<br>From: CDM_AR_tool_14. "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities".Page 25 |

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| **Response from Methodology Developer** | The RSR equation is not used. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding whether the revised methodology still requires application of the RSR. The developer clarified that the revised methodology no longer utilizes the RSR equation but rather, now utilizes a different approach. |

| **Comment Number** | 60 |
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| **Commenter** | Maria Fernanda Buitrago Acevedo |
| **Organization** | South Pole |
| **Date Received** | 1/28/22 |
| **Section** | 9 |
| **Page** | 55 |
| **Public Comment** | Document states"Plot-based sampling approaches (using area-based quantification) may be augmented using double or two-phase sampling approaches combining limited direct plot-based field measurements with wall-to-wall remote sensing metrics to eliminate sample error (and replace with model error). Any remote sensing metrics employed must have demonstrated correlations with biomass (e.g., the Normalized Degradation Fraction Index31 from Landsat imagery, or average canopy height derived from Lidar). The remote sensing metric applied must satisfy the following" We do not understand the “maybe augmented using double or two phase sampling approaches”. What do they mean with double? Do we need to increase the sampling plots to double, and for what reason? |
| **Response from Methodology Developer** | Double sampling will be understood by VVBs and biometricians using the methodology. It is a well-established sampling approach using two sources of data (hence double), e.g. one source being field measurement plots (sample-based, w incomplete coverage) and the other source being aerial imagery (w complete coverage). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commentor requested clarification regarding a sampling approach described in the methodology. The developer responded by stating that VVBs and biometricians utilizing the methodology will understand the approach then gave a brief summary of the approach. The assessment team has also raised concerns regarding this approach and thus this item is pending. |
| **Aster Global Round 4 Findings** | The assessment team has similarly addressed findings related to two phase sampling. Following closure of those items, the assessment team determines that the public comment has been adequately addressed. |

| **Comment Number** | 61 |
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| **Commenter** | Maria Fernanda Buitrago Acevedo |
| **Organization** | South Pole |

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| **Date Received** | 1/28/22 |
| **Section** | 9 |
| **Page** | 57 |
| **Public Comment** | Document states "Area-based quantification Volume of commercial timber extracted is sourced from scaled volumes verified from mill or hauling receipts dated to the monitoring interval ending in year $t$, accompanied by records that identify the source area of the received wood. Census-based quantification Volume of commercial timber extracted is calculated from field measurements of sampled planting units (described further in Section 8.2.2) conducted prior to harvest, as:" For the “area based quantification” some projects that are not implemented yet and have not done harvesting will not have volumes verified from mill receipts. In this case and to calculate the ex-ante for the PDD and the validation, a model or a percentage of expected timber wood could be used as an estimate of the expected timber wood. Is this possible? Would it be possible to use secondary information from scientific articles? |
| **Response from Methodology Developer** | The methodology is not overly prescriptive on ex ante estimates. See Section 8.2.10 "8.2.10 Guidance on ex-ante estimation of project net GHG removals." Importantly, the methodology states "carbon stocks of other pools than trees may be estimated as zero." So harvested wood products could be conservatively assumed to be zero ex ante. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding ex-ante calculation of HWP for the census based approach. The assessment team has also requested clarification regarding this, and us such the developer's response is currently pending. |
| **Aster Global Initial Findings** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |

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| **Comment Number** | 62 |
| **Commenter** | Maria Fernanda Buitrago Acevedo |
| **Organization** | South Pole |
| **Date Received** | 1/28/22 |
| **Section** | Data/Parameter BLDW, t |
| **Page** | 68 |

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| **Public Comment** | Document states "Data / Parameter: $BLDW,t$ t dry matter ha-1 Data unit: Description: Biomass of lying dead wood in year $t$" Biomass of deadwood in the previous methodology could be included by using IPCC values. Is this still the case? Or just direct measurements can be applied? |
| **Response from Methodology Developer** | Only direct measurement. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding updates to the methodology regarding biomass of dead wood. The developer clarified that the updated methodology no longer includes use of IPCC values, appropriately addressing the comment. |

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| **Comment Number** | 63 |
| **Commenter** | Eloïse O'Carroll |
| **Organization** | Sylvera |
| **Date Received** | 1/28/22 |
| **Public Comment** | - Sylvera welcomes this new methodology and recommends that it replaces the previous CDM AR ACM-0003 one as it is comprehensive and more conservative than the previous one.<br>- Sylvera would also welcome a mandatory focus on quantifiable biodiversity outcomes for new ARR projects. The biodiversity crisis is the climate's twin crisis. Too often, tree-growing projects do not maximise biodiversity recovery. Many ARR carbon projects are monoculture or polyculture exotic plantations, which sometimes can have a detrimental impact on biodiversity1. |
| **Response from Methodology Developer** | Biodiversity is covered by VCS safeguards, and net posivite impacts on biodiversity are covered by SDVista or the CCB Standards. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted that they believe the proposed methodology should focus on quantifiable biodiversity outcomes, instead of any potential monoculture outcomes. The developer appropriately noted that this is covered by the VCS safeguards and SDvista/CCB. |

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| **Comment Number** | 64 |
| **Commenter** | Eloïse O'Carroll |
| **Organization** | Sylvera |
| **Date Received** | 1/28/22 |

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| **Section** | |
| **Page** | 35 |
| **Public Comment** | In the proposed methodology, the IPCC data referred to on p.35 regarding the aboveground biomass and root to shoot ratios is from 2006. In 2019, the 2006 figures were updated. They can be found on p.18 of Chapter 4: Forest Land of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories2. ○ Is there a reason why 2006 values are used in the methodology and not the latest ones, which are more specific? Sylvera recommends integrating the latest and more specific 2019 values, shown in the tables in the Appendix in the new VCS methodology. |
| **Response from Methodology Developer** | Updated to IPCC 2019 values. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted that the IPCC values identified for the root:shoot parameter are from IPCC 2006 and suggested they be updated to IPCC 2019. The developer stated that they were revised. However, the referenced text for this parameter does not appear to have been updated to reference the new values. |
| **Aster Global Initial Findings** | CL: Please clarify how this comment has been appropriately addressed. |
| **Round 1 Response from Methodology Developer** | Now updated to reference IPCC 2019 refinement in R parameter table. |
| **Aster Global Round 2 Findings** | The assessment team determined the appropriate update has been made and the comment has been appropriately assessed. Item closed. |

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| **Comment Number** | 65 |
| **Commenter** | Eloïse O'Carroll |
| **Organization** | Sylvera |
| **Date Received** | 1/28/22 |
| **Section** | |
| **Page** | 37 |
| **Public Comment** | Whenever there is a choice to select data inputs, such as root to shoot ratios, wood density, or biomass expansion factors, it is stated that “Data must be chosen from the following sources, listed in descending order of preference:” (p.37 of the draft ARR methodology), and default IPCC values come last. - If a project developer chooses default IPCC values, they should state why no other regional or national values exist to justify their data selection choice. |
| **Response from Methodology Developer** | This is implied and will be checked by the VVB (to confirm the process in the methodology was applied). |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding preference of data sources to be used and whether selection of a choice needs to be clarified by a project developer. The commenter responded that this is implied and will be checked by the VVB. This is appropriate, as this is a standard process for VVBs and similar text/processes are included in other VCS methodologies. |

| **Comment Number** | 66 |
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| **Commenter** | Eloïse O'Carroll |
| **Organization** | Sylvera |
| **Date Received** | 1/28/22 |
| **Section** | |
| **Page** | 31 |
| **Public Comment** | Regarding the census-based quantification uncertainty calculation on p.31 of the draft methodology, could you please explain the rationale behind the 15% deduction (equation 38)? |
| **Response from Methodology Developer** | The 15% precision tolerance follows the VCS Standard (and the rationale is deliberately not repeated here). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding the 15% deduction applied at the end of the equation for uncertainty. The methodology developer clarified that this follows the VCS standard, appropriately addressing the comment. |

| **Comment Number** | 67 |
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| **Commenter** | Eloïse O'Carroll |
| **Organization** | Sylvera |
| **Date Received** | 1/28/22 |
| **Section** | |
| **Page** | 19 |
| **Public Comment** | We welcome the introduction of emission factors for harvested wood products (p.19 of the draft methodology) using data derived from Winjum et al. (1998)3. ○ Are there any more recent figures or even methods for evaluating the fraction of wood products that will be emitted between within five years of production and between five and 100 years after production? |
| **Response from Methodology Developer** | Not that we are aware of for global application. |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Pending Aster FInding issued. |
| **Aster Global Initial Findings** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |

| **Comment Number** | 68 |
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| **Commenter** | Eloïse O'Carroll |
| **Organization** | Sylvera |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.7 |
| **Page** | 23 |
| **Public Comment** | Regarding soil organic carbon (SOC) data, there seems to be uncertainty around SOC gains and losses during harvests, which also depends on the type of afforestation project being implemented (e.g. land class etc.)4. The SOC measurement method seems to be more reliable than the default factor-based method. Why is it not listed as the preferred method for SOC measurements? |
| **Response from Methodology Developer** | The default factor-based method to estimate SOC was deleted. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter requested clarification regarding application of SOC measurement compared to a default value-based approach. The commentor noted that the default factor-based method to estimate SOC was deleted, appropriately addressing this comment. |

| **Comment Number** | 69 |
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| **Commenter** | Kelley Hamrick |
| **Organization** | TNC |
| **Date Received** | 1/29/22 |
| **Section** | |
| **Page** | |

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| **Public Comment** | In general, we support: Switching from CDM-approved to VCS methodologies: Currently, Verra does not have its own ARR methodology; instead, it relies on methodologies developed under the Clean Development Mechanism (CDM). As mentioned in our 2019 public comments to the Technical Advisory Body for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), we were concerned that many of the applying standards (Verra, Gold Standard, American Carbon Registry, etc) included methodologies developed under the CDM without additional requirements. Additionally, since the most recent Verra-approved CDM ARR methodology is from 2013, it raises questions about whether this is using the latest technology or science. |
| **Response from Methodology Developer** | No response |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | This comment is informational and contains no actual questions/concerns. As such no response was required from the developer. |

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| **Comment Number** | 70 |
| **Commenter** | Kelley Hamrick |
| **Organization** | TNC |
| **Date Received** | 1/29/22 |
| **Public Comment** | In general, we support: Dynamic Baselines: The Nature Conservancy applauds the inclusion of background rates of restoration occurring in the project landscape as a dynamic input to the project baseline in the ARR methodology. In general, Verra should continue to prioritize and support dynamic baseline approaches. We also appreciate the novel approach taken to leakage accounting which better incorporates productivity, relative carbon stock differences between the project area and areas leakage will be displaced to, and the fact that leakage dynamics change over time. This is an improvement over leakage accounting in many methodologies and a major improvement over the CDM methodologies, one of which contained an error in the formulae used for leakage accounting. |
| **Response from Methodology Developer** | No response |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | This comment is informational and contains no actual questions/concerns. As such no response was required from the developer. |

| Comment Number | 71 |
|---|---|
| **Commenter** | Kelley Hamrick |
| **Organization** | TNC |
| **Date Received** | 1/29/22 |
| **Section** | Appendix 1 |
| **Page** | 78 |
| **Public Comment** | we do have concerns with some of the technical guidance around estimating baselines, including: Step 3.1 from Appendix A states that the percent cover approach to estimated vegetative stocking (EVS) is poorly suited to herbaceous cover. This is a valid point, but the methodology does not seem to provide explicit safeguards against poor quality EVS estimates including 1) overestimating baseline scenario if there is significant herbaceous cover in satellite imagery on virtual control plots, or 2) overestimating with-project scenario if there is significant herbaceous cover on the with-project area. This should be explicitly incorporated given the scant amount of biomass often stored in herbaceous material and the frequent presence of herbaceous plants in newly regenerating areas of forest and agricultural fields. |
| **Response from Methodology Developer** | We have removed the percent cover approach, in part for the concern raised. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The assessment team noted the commenter's concern has been addressed since Appendix A has been substantially revised and percent cover approach has been removed. |

| Comment Number | 72 |
|---|---|
| **Commenter** | Kelley Hamrick |
| **Organization** | TNC |
| **Date Received** | 1/29/22 |
| **Section** | Appendix 1, Step 4 |
| **Page** | 79 |
| **Public Comment** | On a related note, Appendix A, Step 4 includes "Any plots determined to be in a forest use and temporarily un-stocked at $t$=−5 (e.g., recently cut plantation), confirmed via direct visual inspection of Google Earth…". This description is subjective and does not seem to fully safeguard against potential gaming. It would be useful to know whether the authors explored ways to backstop these intuitive methods with some sort of documentation, metric, or objective standard, as this seems to be a better approach than trusting solely on develop experience and/or auditor diligence. |
| **Response from Methodology Developer** | This step has been removed. The matching approach now includes a historic assessment of EVS (without any subjective evaluations of plots). |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The assessment team noted that the commenter's concern has been addressed because Appendix A has been extensively updated and the matching approach now incorporates a historical assessment of stocking index. |

| **Comment Number** | 73 |
|---|---|
| **Commenter** | Kelley Hamrick |
| **Organization** | TNC |
| **Date Received** | 1/29/22 |
| **Section** | Appendix 1, Step 4 |
| **Page** | 78 |
| **Public Comment** | Finally, there does not seem to be a set minimum for the number of virtual control plots. Initially, 250 plots are selected but then some of these may be removed if they are forested or unstocked. This makes sense, but, given the likely variability in the data derived from optical imagery, there should ideally be a large number of plots to prevent any outlier points from having inordinate leverage. We suggest a set minimum sample size for virtual control plots, likely higher than you would use for actual on-the-ground plots (100 seems a logical number), and that if sample size dips below that, the methodology requires repeating previous steps to select additional samples from the same region from which the original 250 plots were selected. |
| **Response from Methodology Developer** | The methodology now has a minimum sample size specified, and uses a more "traditional" paired matching approach, with weights applied to control plots (higher weight to better matches). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The assessment team noted that the commenter's concern has been addressed as the requirement of a minimum sample size and the matching approach specified in the updated appendix. |

| **Comment Number** | 74 |
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| **Commenter** | Kelley Hamrick |
| **Organization** | TNC |
| **Date Received** | 1/29/22 |
| **Section** | |
| **Page** | |
| **Public Comment** | Finally, we recommend that Verra continues to track the remote sensing space; at some point, this data may be able to outcompete a census-based approach when it is able to detect change at the level of individual trees. It might be worth revisiting the methodology at that time. |

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| **Response from Methodology Developer** | Agree. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | This comment is a recommendation and contains no actual questions/concerns. No revision required. |

| **Comment Number** | 75 |
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| **Commenter** | Fiona Kurylowicz |
| **Organization** | Yale Carbon Containment Lab |
| **Date Received** | 1/28/22 |
| **Public Comment** | The CC Lab has reviewed existing Agriculture, Forestry and Other Land Use (AFOLU) carbon offset methodologies that may be applicable for post-wildfire reforestation, and believes that the VCS Methodology may be particularly suitable for this increasingly common use case. By shortening the minimum length of the crediting period relative to other ARR offset methodologies, this Methodology has the potential to attract wide-scale participation from landowners who are unable to make a 50- or 100-year project commitment. This Methodology also allows project developers greater flexibility to choose sampling methods and operating procedures. We strongly support this advance. Below, we propose a set of clarifications and amendments that we believe will make this Methodology more suitable for adoption in post-wildfire and other climate-affected reforestation scenarios. The comments fall under four broad categories: (1) Tree Planting; (2) Performance Benchmark; (3) Carbon Credit Penalties; and (4) Monitoring, Verification, and Crediting. |
| **Response from Methodology Developer** | No response |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter summarized the benefits of the methodology and relayed further comments below. No response from the developer was required here. |

| **Comment Number** | 76 |
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| **Commenter** | Fiona Kurylowicz |
| **Organization** | Yale Carbon Containment Lab |
| **Date Received** | 1/28/22 |
| **Section** | 8.5 |
| **Page** | 32 |

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| **Public Comment** | 1. Tree Planting<br>1a. Commercial Species on Non-Commercial Lands: The Methodology states that, "Where a commercial tree species is planted as part of the project activity, or the project proponent is a forest management entity, it is conservatively assumed that the project area will be subject to harvest" (Section 8.5, "Net GHG Emission Reductions and Removals"). Recommendation: An exemption should be specified for projects that plant species with commercial value (e.g. Ponderosa pine, Douglas fir) but that are being planted on verifiably non-commercial lands (such as tribal or public conservation land), where there is no intent to harvest or there are clear harvest restrictions.<br>1b. Species Mix and Planting Patterns: Currently, the Methodology is silent on the topic of tree species selection and planting patterns, which is a missed opportunity to advance climate resiliency. Recommendation: The Methodology should explicitly permit changing the project area's tree species mix to boost the replanted forest's resilience to climate and other stressors, so long as species are native to the broader region and not planted as monocultures.2 Likewise, the Methodology should include provisions to allow for (or even reward) lower-density planting approaches in non-commercial forests (where relevant) that mimic natural post-wildfire re-seeding and encourage healthier forest regeneration, such as tree island or spatially heterogeneous reforestation.3 In drier and more fire-prone ecosystems, lower density approaches have been shown to result in higher carbon storage per tree and overall in the forested area.4 |
| **Response from Methodology Developer** | Yes, good point. Text now added: "unless the project area is subject to legally-binding constraints precluding even-aged management (e.g. a conservation easement prohibiting the use of clearcuts), or an explicit attestation documented in the Project Description warranting that even-aged management will not occur, supported by e.g. a notarial deed, or a clause in a permit or similar." The methodology is intentionally agnostic on species mix and planting pattern - all of the approaches mentioned are allowed (implicit in the applicability conditions). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the requirement where commercial species are planted, that that area is assumed to be subject to harvest. The developer took due account and included an allowance for that assumption not to occur if legal/formal agreements are in place to restrict even-aged harvesting. The assessor notes this sufficiently addresses the comment.<br><br>The commenter noted they would prefer the methodology be more specific on species mix and planting patterns to contribute to climate resiliency. The developer noted the methodology is specifically non-prescriptive, and no changes were made as a result of the comment. The assessor notes this is appropriate. |

| **Comment Number** | 77 |
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| **Commenter** | Fiona Kurylowicz |

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| **Organization** | Yale Carbon Containment Lab |
| **Date Received** | 1/28/22 |
| **Section** | Appendix 1, Performance Benchmark |
| **Public Comment** | 2. Performance Benchmark<br>2a. Setting a Control Area Based on Data at t = -5 Years: In Appendix 1, the Methodology requires project control areas to be designated based on remote sensing data collected five years prior to the project start date. However, most post-wildfire reforestation projects occur within 1-2 years of a wildfire event, to preclude severe encroachment by shrubs, grasses, or other herbaceous vegetation. Moreover, ecosystem regeneration following a wildfire is largely determined by its prior wildfire history, i.e. a plot near the project area with a different wildfire history may not be representative of baseline regrowth in the project area. 5,6<br>Recommendation: For post-wildfire reforestation projects, the Methodology should allow the designation of control plots within the same burn area as the project, using remote sensing data collected shortly after the wildfire event or at t = 0.<br>2b. 250 Permanent Virtual Control Plots: Appendix 1 of the Methodology stipulates that 250 or more control plots must be designated remotely for each project. However, in the "Illustrated Example of Performance Benchmark Derivation" in Table 6, only 20 control plots are used to calculate the performance benchmark. There is an order-of-magnitude discrepancy between these two values.<br>Recommendation: The Methodology should clarify which value is correct for the required number of control plots; or, if both are correct, explain this discrepancy. Many post-wildfire or other heterogeneous landscapes may not have 250 or more sites with similar fire histories and geomorphological attributes to use for comparable control plots. Furthermore, this may disincentivize small-scale projects, where setting aside 250 or more control plots may result in more land being used for controls than for reforestation. |
| **Response from Methodology Developer** | In the revised appendix, control plots are matched to the project area based on historic vegetative trend. A prior, significant downward trend (due to fire) would then have to be observed in the control plots in your case. As well, those plots closer to the project area (and so potentially within the same burn) are weighted more heavily in the control, improving the appropriateness of the match. The referenced table makes clear that it is *illustrative* (not illustrated), to show how the procedure works, not set methodology guidance. Minimum sample size is clearly specified in the appendix. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter discussed issues related to wildfire reforestation control area plots and also small projects. Though it mentions fire, the response from the developer does not appear to fully address the concerns raised over post-wildfire reforestation timeline, and especially small projects. The response about weighting was clarifying, but the same language was not clear in the methodology. The illustrative example, although an example, implies that fewer plots may be appropriate. It is not clear to the commenter and thus likely will not be clear to other readers. A different example or more clarification would be helpful. |

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| **Aster Global Initial Findings** | CL: Please address all Findings here. |
| **Round 1 Response from Methodology Developer** | The methodology appendix now allows additional attributes to be incorporated in matching, either at the donor pool selection stage (The project may include other spatially explicit, categorical, include additional filtering layers to further refine the eligible control area according to region-specific and culturally-relevant drivers of drivers of carbon regeneration or reforestation, . Any additional factor used to delineate the donor pool area must be provided they are justified on a theoretically sound, or empirically-demonstrated, basis (e.g. peer-reviewed study).) or NN matching stage (Additional matching covariates may be incorporated provided that: (1) they are continuous variables, (2) there is a theoretically sound, or empirically-demonstrated, basis for including them (e.g. peer-reviewed study) and (32) they are derived from direct measurements or published sources.). For example, in the case of post wildfire restoration, geospatial datasets delineating burn scars, and classifying in terms of time and severity, could be included. We acknowledge though, that the more narrow the matching criteria become, the less potential pool of control plots is available. |
| **Aster Global Round 2 Findings** | For 2a, changes to the appendix have been made to allow flexibility in delineating the donor pool area and nullify the original concern.<br><br>For 2b, the original requirement of 250 plots has been omitted and the example revised. Thus, the comment has been addressed. |

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| **Comment Number** | 78 |
| **Commenter** | Fiona Kurylowicz |
| **Organization** | Yale Carbon Containment Lab |
| **Date Received** | 1/28/22 |
| **Section** | 7; 8.2.2; 8.2.6; 8.2.7 |
| **Page** | |

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| **Public Comment** | 3. Carbon Credit Penalties<br>3a. Pre-Planting Project Area Preparation: The Methodology currently penalizes project developers for carbon lost during pre-project land clearing and site preparation: removal of shrubs, removal of litter, and damage to soil organic carbon (Sections 8.2.2, 8.2.6, and 8.2.7). However, the Methodology also describes distressed ecological conditions due to catastrophic natural events such as wildfire or the unfavorable course of natural succession as a barrier to implementation of the project activity, and as a means to prove the project's additionality (Section 7, "Additionality"). Clearing the project area and damaging pre-existing carbon stocks is therefore a necessary first step for many such projects, and enables more resilient growth and a larger carbon sequestration opportunity in the longer term. Recommendation: In instances when reforesting a landscape will prevent it from undergoing verifiably non-anthropogenic habitat conversion or degradation (e.g. shrub or grass encroachment after severe fires), or when project area preparation involves the removal of invasive species, projects should not be penalized for carbon lost during site preparation. Non-anthropogenic habitat conversion can be observed and quantified in selected control areas with the same wildfire or other severe disturbance history. |
| **Response from Methodology Developer** | This methodology is not designed to predict land use conversions like those alluded to, nor to credit avoided emissions from such conversions. Where site prep, as part of the project activity, produces an emission, it must be accounted for to have an accurate accounting of net impacts. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account by clarifying the site prep emissions associated with the project activities must be accounted for. Revisions to the methodology through the process further substantiate this. Clarification is provided that the methodology does not credit avoided emissions from conversion as suggested by the commenter. Additional clarification provided regarding the above comment further substantiate this. This item is addressed. |

| **Comment Number** | 79 |
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| **Commenter** | Fiona Kurylowicz |
| **Organization** | Yale Carbon Containment Lab |
| **Date Received** | 1/28/22 |

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| **Public Comment** | 4. Monitoring, Verification, and Crediting<br>4a. Periods and Timelines: Verra outlines its monitoring, verification, and crediting protocols for AFOLU projects in a set of general, external documents. However, the current draft of the Methodology neither refers readers to these documents, nor shares guidance on monitoring, verification, and crediting issues specific to this Methodology. This makes it difficult for non-specialist developers to understand and adopt the Methodology.<br>Recommendation: For improved clarity, all monitoring, verification, and crediting requirements would ideally be outlined in the Methodology itself. At the bare minimum, the Methodology should make explicit reference to external documents required to understand crediting protocols and timing for this Methodology, for example the "VCS Standard v. 4.0" to determine minimum and maximum crediting period lengths, the "AFOLU Non-Permanence Risk Tool" to calculate buffer pool deductions from credits issued, the "Registration and Issuance Process" to understand buffer pool credit cancellation and "time release," and any others. The Methodology should include resources (or reference to resources) on monitoring and verification timing and requirements, and on timing for credit issuance. The document should also clarify the timing of major Methodology-specific milestones, such as when the first verification after replanting should occur.<br>4b. Failure of Non-Permanence Risk Assessment Upon Subsequent Verification: Though Verra's Non-Permanence Risk Assessment Tool disqualifies projects which initially exceed certain risk thresholds, neither the Registry nor the Methodology address what might occur should a project fail a risk assessment during a subsequent verification. Post-wildfire reforestation projects face changing, often increasing fire risk as replanted forests mature in the midst of a hotter and drier climate, and become more dense through natural regeneration after planting. A number of high-profile carbon offset projects have experienced fire-related reversals after reforestation.7<br>Recommendation: The Methodology should clarify how to proceed if a project's natural risk is deemed too great upon a non-initial verification.<br>4c. Heavily Discounted Upfront Credit Issuance: Credit issuance under the current Methodology occurs after each verification event, with the number of credits issued directly proportional to the amount of carbon sequestered in trees. As a result, while this aligns with actual sequestration, the project payback will be slow, potentially discouraging investment by parties who do not have immediate access to patient capital, such as many Tribal Nations and small landowners. In the CC Lab's experience, the significant upfront costs of reforestation are often a sufficient barrier to prevent replanting on non-commercial forestlands, and could inhibit wider adoption of the Methodology.<br>Recommendation: Verra should allow the issuance of a discounted portion of the project's expected carbon credit generation up front after an initial verification, similar to CAR Climate Forward's Reforestation Forecast Methodology, to help directly defray the upfront costs of replanting. The project proponent could have the option to, or be required to, transition back to a regular monitoring and verification cycle after initial credit issuance, and earn credits for carbon that is verifiably sequestered and stored. |

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| **Response from Methodology Developer** | 4a - Methodologies do not repeat guidance in the overarching VCS Standard or other VCS Program documents. This is so that Verra does not have to go into each methodology whenever updates are made to a Program document.<br><br>4b - The project would become unviable, however Verra is working on updates to the AFOLU NPRT to consider impacts of climate change outset of project development.<br><br>4c - Verra is working on a Projected Carbon Unit to help project proponents to cover the upfront costs. (https://verra.org/early-finance-carbon-unit-public-consultation/) |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | 4a: The methodology developer clarified that guidance from the VCS Standard and other VCS program documents are intentionally not repeated in the methodology. This is an appropriate response.<br><br>4b. The methodology developer noted Verra is working on updates to the NPRT. The commenter's initial concern is unable to be addressed within the context of the methodology, but rather in the context of the NPRT itself.<br><br>4c. The commenters recommendation is not within the context of the methodology, but rather a responsibility of Verra. Due account was taken informing the commenter of the PCU. This item is addressed. |

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| **Comment Number** | 80 |
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |

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| **Public Comment** | Components of the ARR Methodology where alterations could improve accessibility to agroforestry projects are:<br>• Applicability conditions that exclude agroforestry activities where emission sources that are not included in the methodology could be significant (see Section 2.2);<br>• Inclusion of investment analysis as an option for demonstrating additionality (see Section 2.3);<br>• Expanding the conditions for assuming zero baseline emissions from tree biomass to include any land where it can be demonstrated that tree biomass has declined over the last 10-years (see Section 2.4);<br>• An option to include default values for SOC other than the IPCC values in the CDM A/R Soil tool (see Section 2.5.2.3);<br>• Standardised leakage discount factors that are more appropriate for agroforestry interventions (see Section 2.6);<br>• Details of how the leakage module can be applied to generate a leakage discount factor for projects using census-based approaches (see Section 2.6); and<br>• Clarification of the types of harvesting that require long-term average accounting (see Section 2.8).<br>Components of the ARR Methodology where additional guidance may help those applying the methodology to agroforestry projects include guidance on:<br>• When there is considered to be a change in land use in the context of an agroforestry project (see Section 2.1);<br>• Conservative ex-ante estimation of changes in tree biomass (see Section 2.5.1);<br>• Stratification of project areas in an agroforestry context (see Sections 2.5.2.1 and 2.5.3.1);<br>• Appropriate plot-based sampling approaches for different agroforestry systems (see Section 2.5.2.2); and<br>• Calculating percentage uncertainty from stratified samples (see Section 2.7). |

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| **Response from Methodology Developer** | Applicability conditions that exclude agroforestry activities where emission sources that are not included in the methodology could be significant (see Section 2.2); > what do you suggest? They are quite broad compared to other methodologies. Restoration activities on wetlands are covered by WRC methodologies.<br>• Inclusion of investment analysis as an option for demonstrating additionality (see Section 2.3); > this is included in Section 7 step 2b under "investment barrier"<br>• Expanding the conditions for assuming zero baseline emissions from tree biomass to include any land where it can be demonstrated that tree biomass has declined over the last 10-years (see Section 2.4); > a trend doesn't reflect potential, and this should reflect potential. The bar should be high for using the simplified (zero) performance benchmark.<br>• Default values for SOC were excluded from the methodology.<br>• Standardised leakage discount factors that are more appropriate for agroforestry interventions (see Section 2.6); > what would those be? The revised leakage tool is expanded to look at commodity displacement and productivity enhancement for whatever the relevant commodity is (traditional ag, agroforestry …)<br>• Details of how the leakage module can be applied to generate a leakage discount factor for projects using census-based approaches (see Section 2.6); > the tool operates identically for area-based and census-based approaches. Also, many census-based projects will not involve a change in land use and thus result in no activity displacement, i.e. zero leakage.<br>• Clarification of the types of harvesting that require long-term average accounting (see Section 2.8). > now specified (even-aged harvesting – clearcuts, shelterwoods and seed tree cuts)<br>Components of the ARR Methodology where additional guidance may help those applying the methodology to agroforestry projects include guidance on:<br>• When there is considered to be a change in land use in the context of an agroforestry project (see Section 2.1); > Table 1 has been clarified to reference IPCC land use categories (forest land, cropland, grassland, wetland, settlements and other land). Agroforestry is classified as either forest land or cropland, depending on the forest definition. If an improved/expanded agroforestry system changed the land use from cropland to forest land, it would not qualify for the census-based approach (and presumably the extent/scale of that transition would preclude the census-based approach anyway).<br>• Conservative ex-ante estimation of changes in tree biomass (see Section 2.5.1); > this is not the principal use of a methodology, and the guidance is kept minimal and non-prescriptive.<br>• Stratification of project areas in an agroforestry context (see Sections 2.5.2.1 and 2.5.3.1); > see parameter tables re sample designs. Stratification may always be used, but is not required.<br>• Appropriate plot-based sampling approaches for different agroforestry systems (see Section 2.5.2.2); > again, the methodology is not meant to provide sample designs for users. Perhaps this is something that Verra would consider developing to support project implementation, e.g. sample field measurement protocols, sample designs, etc. (we recognize that these can be challenging in an agroforestry context, so the need is there)<br>• Calculating percentage uncertainty from stratified samples (see Section 2.7). > not necessary, and would be unmanageable from a methodological standpoint to lay out estimators for a wide range of sample designs. The statistics are well understood by VVBs. |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter provided a list of suggestions where alterations to the methodology count improve accessibility to agroforestry projects. The methodology developer took due account by responding to each suggestion individually. The assessment team reviewed the responses and has determined that responses are appropriate. This item is assessed. |

| **Comment Number** | 81 |
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| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | 2.1 Applicability Conditions<br>The ARR Methodology allows for two quantification approaches: area-based and census-based. The area-based approach is appliable to ARR activities that can be clearly delineated spatially, while the census-based approach requires a complete census of all planting units. The census-based approach is described as being best-suited to dispersed planting activities including agroforestry and is not applicable if there is a change in land use. To assist agroforestry projects to determine which quantification approach to follow, it could be useful to include guidance on when there is considered to be a change in land use in the context of an agroforestry project. For example:<br>Area-based approach for:<br>• Grassland to Cropland, when an agroforestry system with dispersed planting of trees is established on grassland.<br>• Cropland or Grassland to Forest land, when an agroforestry system results in tree cover sufficient to mean the definition of forest land.<br>Area-based or census-based approach for:<br>• Cropland remaining Cropland or Grassland remaining Grassland, i.e. when trees planted do not result in tree cover sufficient to meet the definition of forest land.<br>• Forest land remaining Forest land, when an agroforestry system is established in forest land e.g. cacao agroforestry. |
| **Response from Methodology Developer** | Applicability condition stricken (had been included to exclude leakage). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account of the commenters concern, noting that the referenced applicability condition and associated concerns raised have been removed. This item is addressed. |

| **Comment Number** | 82 |
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| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |

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| **Date Received** | 2/1/22 |
| **Public Comment** | Carbon Pools and Emission Sources<br>Some agroforestry interventions could meet the definition of ALM as well as ARR, which could affect the selected carbon pools and emission sources e.g.:<br>• Above-ground non-tree biomass, litter and deadwood must be included if significant in ARR projects, but not ALM projects<br>• SOC must be included in ALM projects, but must only be included if significant in ARR projects<br>• N2O emissions caused by microbial decomposition of plant materials that fix nitrogen may be significant for some agroforestry activities<br>• Agroforestry activities that take place in areas with livestock grazing that would require the inclusion of CH4 emissions from enteric fermentation and CH4 and N2O emissions from manure in the project boundary<br>There may therefore need to be some applicability conditions that exclude agroforestry activities where emission sources that are not included in the methodology could be significant, or guidance on how these pools should be included if they are significant or when an ALM methodology should be used. |
| **Response from Methodology Developer** | Livestock grazing is not an ARR activity, and so is not applicable under this methodology (which, as you point out, does not include emissions from enteric fermentation). In such a case the project would have to use a ALM methodology (which can include woody biomass pools).<br><br>We are considering creating an agroforestry project development guidebook to help agroforestry PPs identify the most suitable approach for their context. The guidebook may include a decision tree for PPs to select the most appropriate methodology for their intervention (e.b., ALM v. ARR).<br><br>N2O emissions from planting nitrogen fixing species now included. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account of suggestions provided by the commenter, noting the consideration of creating an project development guidebook. This item is addressed. |

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| **Comment Number** | 83 |
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Additionality<br>The ARR Methodology excludes Investment Analysis as an alternative to Barrier Analysis for demonstrating additionality using the project method for assessing additionality. Investment Analysis could be suitable for some agroforestry activities. |

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| **Response from Methodology Developer** | Barrier analysis includes an investment barrier, so this option is there for agroforestry activities. Additionally, demonstration of an implementation barrier is now required for all projects (even those using a performance benchmark) as an added safeguard. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account by clarifying that investment barriers can be applicable to agroforestry activities and clarified the added safeguard of an implementation barrier. This item is addressed. |

| **Comment Number** | 84 |
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| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Baseline Emissions<br>The potential to set the performance benchmark to zero in project areas where there are no governmental programs or incentives for tree planting, and there has been continuous cropping for at least 10-years, is useful for agroforestry projects. If this could be expanded to include any land where it can be demonstrated that tree biomass has declined over the last 10-years, this would increase the potential for agroforestry projects to simplify their accounting. |
| **Response from Methodology Developer** | a trend doesn't reflect potential, and this should reflect potential. The bar should be high for using the simplified (zero) performance benchmark. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account by clarifying that the proposed situation does not reflect potential and thus does not constitute a "high bar" for using the simplified performance benchmark. The assessment team determined this is a reasonable response and thus this item is addressed. |

| **Comment Number** | 85 |
|---|---|
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Project Emissions<br>Ex-ante estimation<br>Ex-ante estimates of tree biomass should be derived from tree growth and stand development models, or published data relevant to the project area. There is a scarcity of tree and stand growth models that apply to agroforestry species, so guidance on conservative ex-ante estimation of changes in tree biomass may help agroforestry projects. |

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| **Response from Methodology Developer** | this is not the principal use of a methodology, and the guidance is kept minimal and non-prescriptive. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer clarified that prescriptive guidance on establishing ex ante biomass estimation is not the principal use of the methodology in response to the commenter. The assessment team determined that inclusion of such estimation processes would be over prescriptive in the sense of this methodology. This item is addressed. |

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| **Comment Number** | 86 |
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Area-based approach Stratification<br>Stratification is mentioned as an option to improve precision but is not required by the methodology. The implementation of agroforestry activities, especially in a smallholder context, often includes considerable variation in baseline conditions and project activities, and factors (such as the end use of trees) that are not typically considered when designing stratified sampling for A/R projects, but that could influence long-term carbon stocks. Guidance on stratification of project areas in an agroforestry context could therefore help agroforestry projects to apply the methodology. |
| **Response from Methodology Developer** | See parameter tables re sample designs. Stratification may be used, but is not required. Providing detailed guidance on sample designs and field measurement protocols is beyond the scope of an accounting methodology. However, it is intended to develop an annex with guidance on MRV in agroforestry settings, which could cover these considerations. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about adding stratification guidance on project areas in an agroforestry context. The developer took the comments into consideration, noting that stratification is optional and that general guidelines are provided in parameter tables. The developer also stated that providing thorough stratification guidance and measurement protocols is outside the scope of an accounting methodology. The developer stated that an appendix with guidance on MRV in agroforestry contexts is anticipated, which may include these considerations. The assessor finds that the developer's response is appropriate. |

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| **Comment Number** | 87 |
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |

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| **Public Comment** | Area-based approach<br>Plot-based sampling<br>The methodology acknowledges “the wide range of valid approaches [for plot-based sampling], and that relative efficiency and robustness are circumstance-specific”. So sampling, measurement, and estimation procedures are not specified in the methodology<br>Optimal approaches for plot-based sampling for some agroforestry systems, e.g., alley cropping, may be different from typical methods commonly applied in A/R projects. Agroforestry projects may therefore benefit from some guidance on appropriate plot-based sampling approaches for different agroforestry systems. |
| **Response from Methodology Developer** | Again, providing detailed guidance on sample designs and field measurement protocols is beyond the scope of an accounting methodology. However, it is intended to develop an annex with guidance on MRV in agroforestry settings, which could cover these considerations. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about adding guidance on sampling approach for agroforestry systems. Similar to response to above comment, the developer took the comments into consideration, noting that providing thorough stratification guidance and measurement protocols is outside the scope of an accounting methodology. The developer stated that an appendix with guidance on MRV in agroforestry contexts is anticipated, which may include these considerations. The assessor finds that the developer's response is appropriate. |

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| **Comment Number** | 88 |
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Area-based approach<br>Soil organic carbon<br>Agroforestry projects have the option of applying IPCC default values for changes in SOC if they result in land use change (i.e. they can be classified as A/R). IPCC default factors may not be well suited to agroforestry activities, however, and If area-based approaches were available for interventions that don’t meet the A/R definition, alternative default values would be needed. Could there be an option for using alternative default values, if they have a sufficient evidence base? |
| **Response from Methodology Developer** | This would introduce too much potential for gaming, shopping around for the best default value and will not be included to the methodology. |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the possibility of incorporating default values for the soil organic carbon. The developer responded by noting it may bring potential for finding the best default values that favor the project and was thus not included in the methodology. The assessor finds the response to be appropriate. |

| **Comment Number** | 89 |
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| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Census-based approach Stratification<br>The methodology suggests that when defining cohorts for monitoring "an appropriate representative sample would be a stratified systematic sample, within each annual cohort, selecting planting units systematically with a random start from the list of unique censused planting units." Agroforestry projects may benefit from guidance on defining cohorts in line with this suggestion, that takes account of different species and end uses etc. |
| **Response from Methodology Developer** | Stratification may be used, but is not required. The parameter tables are not meant to be a user manual, nor serve as standard operating procedures. Projects will have to develop these kind of detailed step by steps, as well as sample designs, to guide the collection of field data and ensure that the "bare" requirements in the parameter tables and methodology are met. The methodology is deliberately non-prescriptive to allow flexibility and innovation for PPs seeking to improve cost efficiencies, while providing enough requirements to ensure minimization of bias (sample design, QA/QC procedures) and permit proper estimation and accounting of sample error (sample design), namely via these overarching provisions: 1. Be demonstrated to be un-biased and derived from representative sampling 2. Accuracy of measurements and procedures is ensured through employment of quality assurance/quality control (QA/QC) procedures (to be determined by the project proponent and outlined in standard operating procedures governing field data collection) |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account by providing guidance, noting that the parameter description table is only for guidance, but project developers need to develop project specific methods to address. |

| **Comment Number** | 90 |
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| **Commenter** | Nicholas Berry |

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| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Uncertainty<br>Procedures for quantifying uncertainty include the parameter: $Up,t$ Percentage uncertainty (expressed as 95% confidence interval, as a percentage of the mean) in carbon stock estimate of pool $p$ (representing woody biomass, herbaceous biomass, dead wood, harvested wood products, litter, and SOC) in the project scenario in year $t$ (%) This is calculated from sampled field measurements. Guidance on calculating percentage uncertainty from stratified samples/cohorts could help agroforestry projects that use stratified sampling. |
| **Response from Methodology Developer** | It would be unmanageable from a methodological standpoint to lay out variance estimators for a wide range of sample designs, nor necessary as the statistics are established and widely available and are well understood by VVBs.<br>However, it is intended to develop an annex with guidance on MRV in agroforestry settings, which could cover these considerations. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The methodology developer took due account by clarifying that that uncertainty will be assessed by VVBS. Given the changes to the uncertainty calculation in response to findings the assessment team believes this has been appropriately assessed. |

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| **Comment Number** | 91 |
| **Commenter** | Nicholas Berry |
| **Organization** | TLLG |
| **Date Received** | 2/1/22 |
| **Public Comment** | Net GHG Emission Reductions and Removals<br>The methodology states that “Where project activities include harvesting, the maximum number of GHG credits generated by these activities over the crediting period must not exceed the long-term average GHG benefit”. Many agroforestry activities are likely to include some harvesting, but this may not follow typical harvesting patterns. Clarification of the types of harvesting that require long-term average accounting, including examples that represent different types of agroforestry, could help agroforestry project developers to identify when long-term average GHG benefit must be used to meet the requirements in this methodology and the VCS Standard. |
| **Response from Methodology Developer** | now specified (even-aged harvesting – clearcuts, shelterwoods and seed tree cuts) |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The section of the methodology that the commenter and the developer were referring to has been taken out of the most recent version. |

| **Comment Number** | 92 |
|---|---|
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Public Comment** | When using the performance benchmark in the area-based approach: If a project outperforms the control area (e.g., baren land), would the project be additional even if it was financially viable without carbon finance? If so, does the methodology safeguard against projects that may not be financially dependent on carbon revenue? |
| **Response from Methodology Developer** | We have now revised to require demonstration of an implementation barrier in addition to use of the performance benchmark. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter inquired about project additionality evaluation and methods for safeguarding against projects that are not dependent on carbon revenue. The developer considered the comment and amended the section to provide a demonstration of an implementation barrier in addition to use of the performance benchmark. The assessor notes the developer's revision to be appropriate. |

| **Comment Number** | 93 |
|---|---|
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Public Comment** | If the control area were instead plantations: Could the project simply be deemed additional for performing “better” than the control plantation? For example, if a project planted more and faster growing species? |
| **Response from Methodology Developer** | Yes. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | A commenter asked if the project is considered additional if the control area was a plantation and the project area exceeded the controlled plantation. The developer agreed with the comment. The assessor considers the developer's respond to be appropriate. |

| **Comment Number** | 94 |
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| **Commenter** | Elijah Umek |

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| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Public Comment** | The wording related to the government subsidies test is unclear. Does it indicate that a project may be additional (i.e., in need of carbon revenue) if other similar projects are dependent on government subsidies or it is additional despite receiving such subsidies. Please clarify. |
| **Response from Methodology Developer** | the requirement states "… exclude any areas … with presence/absence of any operating government-funded program providing incentives for tree planting that differs from the project area" So if the project operates in an area where a government incentive policy is administered, then control plots may not come from an area where no government incentive policy is administered. What this means in practice is that this kind of project will have a higher hurdle for additionality, because there is a high level of business as usual reforestation that must be accounted for. With the application of proportional additionality here, this is not a binary determination > a project can still produce a net benefit in such a landscape, it just has to plant more trees than its non-C project peers. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter noted the government subsidies test is unclear. The developer took due account and further explained how it would work in the project scenario. The assessor believes the developer's comment was sufficient, and no changes to the methodology were required.<br><br>PENDING ROW 26 above. |
| **Aster Global Round 4 Findings** | Following closure of the public comment in Row 26, this finding is closed. |

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| **Comment Number** | 95 |
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Public Comment** | If a project only harvests a small portion of the project area (<10%), would the long-term average (LTA) still apply? If so, is this approach overly conservative? Would it not be more practical to allow projects to stratify harvested and non-harvested areas? |
| **Response from Methodology Developer** | Good point. Methodology revised to allow project to be stratified to account LTA only in areas subject to even-aged harvest. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the practicality of stratification in harvesting. The developer responded that the methodology has been revised to allow projects to be stratified to account for LTA only in regions subjected to even-aged harvest. However, the assessor noted that the section "Account for tree harvesting" has been omitted from the most recent version of the methodology. |
| **Aster Global Initial Findings** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |

| Comment Number | 96 |
|---|---|
| Commenter | Elijah Umek |
| Organization | Shell |
| Date Received | 1/27/22 |
| Public Comment | The appendix states that in order to use the performance benchmark an estimated vegetative stock (EVS) must be taken at t = -5 and reassessed every five years. This stock must be within +/-10% of the project area. There is concern that this requirement could be too strict and ultimately punish high performing project areas whose regeneration outpaces control plots by >10% in a five-year period. |
| Response from Methodology Developer | That was only intended for *initial* stocks. This requirement has been stricken. |
| Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate. | The commenter asked about the strictness of the criteria for stock to be +/-10%. The developer took this into consideration and stated that it was only for the initial stock. The assessor noted that this section no longer exists in the most recent version of Appendix due to considerable revision since the public comment period. |

| Comment Number | 97 |
|---|---|
| Commenter | Elijah Umek |
| Organization | Shell |
| Date Received | 1/27/22 |
| Section | 4; 8.2.2 |
| Page | 7; 17 |
| Public Comment | Should the performance benchmark still consider the financial characteristics of the project so that only projects with a financial need are deemed additional? |
| Response from Methodology Developer | Yes, additionality now requires demonstration of an implementation barrier in addition to the performance benchmark. |
| Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate. | Similar to comment number 92, the commenter asked about the project's financial implications. The assessor confirms that the developer's response is appropriate. |

| Comment Number | 98 |
|---|---|
| Commenter | Elijah Umek |
| Organization | Shell |
| Date Received | 1/27/22 |

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| **Public Comment** | Does the methodology allow for restoration of degraded forests? P7. S4. Appears to allow restoration of partially degraded forest, but this is not explicit. The need to account for 'pre-existing woody biomass' (P17, S8.2.2) appears to support this. |
| **Response from Methodology Developer** | Yes. This is why the methodology deliberately does not reference a forest definition. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the methodology's applicability for degraded forest restoration. The developer took due account of the comment and stated that the methodology purposefully omitted referencing a forest definition. The assessor confirms that the developer's response is appropriate. |

| **Comment Number** | 99 |
|---|---|
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Section** | 4 |
| **Page** | 7 |
| **Public Comment** | P7. S4. Allows for 'indirect activities, e.g., activities that permit or facilitate natural regeneration', however this would only seem applicable to the area-based approach, not the census-based approach (which relies on the existence of 'planting units') however it is not stated here, which raises the question as to whether a 'planting unit', in this circumstance, could be an existing natural regenerated sapling? |
| **Response from Methodology Developer** | Good point. Census-based quantification would absolutely not work with facilitated natural regeneration, because it requires a determination that each planting unit is directly attributable to the project activity. Also, thousands and thousands of naturally-regenerated seedlings would not be workable using the census-based approach. This is now clarified in Table 1. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter asked about the applicability of "natural regeneration" in census-based approach. The developer took due account of the comment and<br>clarified it by pointing to the revision made in Table 1 of the methodology. The assessor confirms that the developer's response is appropriate. |

| **Comment Number** | 100 |
|---|---|
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Section** | 4 |
| **Page** | 7 |

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| **Public Comment** | P7. S4. Wetland restriction: 'Species that naturally occur' – lots of species naturally occur, but not all dominate as in a planted monoculture. Could this be a loophole to affect the water table? Is it not better to state that projects must demonstrate that water table is unaffected by activity? |
| **Response from Methodology Developer** | This is admittedly an imperfect application, but applicability conditions require a clear determination to be made once ex ante, and thus cannot be monitored. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | This comment has been addressed through removal of WRC component. |

| **Comment Number** | 101 |
|---|---|
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Section** | Table 2 |
| **Page** | 8 |
| **Public Comment** | P8. Table 2. Census based. "No pre-existing woody biomass (e.g., trees or shrubs) is removed to provide space for the plantings" is extremely hard to confirm. Additionally, while one might not remove the pre-existing woody biomass, a competitor could be planted next to it to outcompete resources. This potentially allows the census-based method to be used in a situation where the baseline is natural recovery and thus side-stepping performance benchmark as baseline? |
| **Response from Methodology Developer** | Text added to Table 1 applicability condition: "(confirmed via pre-project photos and/or attestation)." It is true that the census-based quantification approach would not account the deleterious effects of competition from the planted units on neighboring vegetation, but given the necessary orientation of this approach to small-scale activities, and requirement that the activity does not result in a change in land use, it is reasonable to expect that those impacts would be small relative to the removals accounted in the planting units. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter inquired about the methods for confirming no pre-existing woody biomass (e.g., trees or shrubs) removal for planting in a census-based approach. The developer took due account of the comment and clarified it by pointing to the revision made in Table 1 of the methodology. The assessor confirms that the developer's response is appropriate. |

| **Comment Number** | 102 |
|---|---|
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |

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| **Section** | 8.2.7 |
| **Page** | 23 |
| **Public Comment** | P23. 8.2.7. Soil carbon. Interesting that it cannot be accounted for with census method. Two options given to measure for area-based method (one capped at 0.8TC/ha/yr, as per CDM). Presumably a project could use both and choose which one gave the most? Do projects have to choose one at the outset, or could they change options through a deviation during the crediting period? |
| **Response from Methodology Developer** | Clarifying text added to 8.2.7 - "One method must be selected at the project start and held constant through the project crediting period." SOC can't be accounted using the census-based approach because any SOC measured or estimated cannot be attributed solely to the planting units (and there would be no clear means to estimate an attributable fraction). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter expressed concern about the absence of Soil Organic Carbon (SOC) accounting in census-based methods and questioned how the project may employ choices to quantify SOC. The developer responded to the comment by pointing to the clarifying text included to 8.2.7. The assessor considers the developer's statement regarding SOC being unable to be accounted for using the census-based method to be reasonable. The assessor, however, was unable to locate any clarifying text added to 8.2.7 as reported by the developer. |
| **Aster Global Initial Findings** | CL: Please clarify in line with the assessor's findings. |
| **Round 1 Response from Methodology Developer** | Our mistake. There is no clarifying text in 8.2.7. Again, the census-based project boundary is limited to the tree itself, and so any SOC inputs, e.g. witnessed *around* the tree, cannot be certainly attributed to inputs from the tree itself. |
| **Aster Global Round 2 Findings** | Thank you for the clarification. Item closed. |

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| **Comment Number** | 103 |
| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Section** | Appendix 1, Performance Benchmark |
| **Public Comment** | Appendix 1. A novel approach to ARR project types, however, it seems to have some of the same risks i.e., the potential for projects to choose reference areas/control plots that benefit them the most. May be challenging to use in a situation of restoration of degraded forest (presumably 'remote sensing metric' method would need to be used to show biomass rather than just % cover?) |
| **Response from Methodology Developer** | Percent cover approach dropped. Revised and expanded matching approach should be sufficiently standardized and quantitative to avoid gaming (there are no qualitative judgements in the selection of valid control plots). |

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| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter raised concern about the possibility of the performance benchmark being utilized for the profit of the project, as well as the difficulty of its use in the regrowth of degraded forests. The developer took the comment into consideration and answered by indicating that the percent cover strategy has been discarded and that only the remote sensing metric method would be employed. The developer also stated that the matching process should be sufficiently standardized and quantitative to minimize manipulation. The assessor notes that the developer's response and changes made is appropriate. |

| **Comment Number** | 104 |
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| **Commenter** | Elijah Umek |
| **Organization** | Shell |
| **Date Received** | 1/27/22 |
| **Public Comment** | How does Verra intend to reconcile the existence of two ARR methodologies? It appears the intention of this methodology is to improve upon that offered by CDM, however, it has not been classified as a revision. As such, per the VCS Standard, the two methodologies could exist irrelevant to the other. Does Verra intend this to be the case, or does the approval of the Verra ARR methodology preclude the use of the CDM ARR methodology? |
| **Response from Methodology Developer** | Verra will publish the decision to phase-out the CDM A/R methodology and grace period in a timely manner. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | The commenter raised concern regarding VERRA's plans for reconciling the presence of two ARR methodologies. The developer responded that VERRA will be phasing out the CDM A/R methodology in a timely manner but will provide an appropriate grace period. The assessor notes this response took due account of the comment, and no changes to the methodology were needed. |

| **Comment Number** | 105 |
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| **Commenter** | Miguel Fabra |
| **Organization** | Stafford Capital Partners |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.4 |
| **Page** | |

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| **Public Comment** | Step 1: There is currently only a very high-level description in the methodology on how to calculate this first step, however we +106:109step to be the most impactful in the whole calculation. In practice we would use one of the existing software packages (usually country specific) to determine the wood products that can be extracted from a forest in a thinning or clear fell (however this is not a requirement from your methodology, and there is neither an indication on how this should be calculated in a way that VCS will accept) for example, by using this software in Brazil: https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/1485/sis-pinus---simulador-de-crescimento-e-producao-de-pinus (STAKEHOLDER INCLUDED A FIGURE IN THE PDF DOCUMENT) Still, this only gives at the thinning or clearfell the volumes by diameter class, and another calculation would be needed to convert this output into the proportion that goes into the five different wood products classes that you request for Step 1. As a general convention in the forest sector we could say that over 8 cm diameter is sawlogs and under 8 cm is pulpwood. However, there are no rules or guidance for the conversion from these two classes into the five wood product classes that you suggest. At the country level, there is FAO data with which we could infer the ratio of wood that goes into each category, or at the individual plantation project we could derive a more specific split given the current industry located nearby, but there is no indication in the methodology on what would be the best standardized way to do this product split. |
| **Response from Methodology Developer** | See detailed guidance in parameter table for the Vex,ty parameter. This is dependent on direct project area volume estimates. It's not the wood products that could be extracted, it is the wood products that have been extracted. > "Volume of commercial timber extracted is sourced from scaled volumes verified from mill or hauling receipts dated to the monitoring interval ending in year t, accompanied by records that identify the source area of the received wood" For parameter table Vex,ty, we have added the following "Assigned product class ty must be supported with evidence sourced from the receiving wood processing facility (e.g. mill specifications, written attestation)." |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |

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| **Comment Number** | 106 |
| **Commenter** | Miguel Fabra |
| **Organization** | Stafford Capital Partners |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.4 |

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| **Public Comment** | About the 5 wood product classes<br>You have based the methodology on the Winjum et al publication from 1998 (in turn based in FAO data from 1995), but nowadays 26 years later, FAO has considerably more data, with a complete hierarchy of wood products, that allows a clearer understanding of end uses. This graph below is the wood flow with data from FAO database (2020): (STAKEHOLDER INCLUDED A GRAPH IN THE PDF DOCUMENT)<br>When it comes to comparing with your division, the first problem would be with plywood, which represents an important share of the industrial wood globally (187m m3 output, thus about 375 m m3 input), and its consideration as a wood-based panel. The raw material for plywood is from the same log product as you would cut sawnwood (sawlogs) whilst the raw material for the rest of wood panels is either from pulpwood or from the byproducts of the sawmilling processes (woodchips). From the perspective of its use as a wood product, it is also different as plywood goes mostly into structural uses, more similar to sawnwood. Therefore, in our opinion plywood should be grouped with sawnwood and not with wood panels.<br>When we think about the sawlog conversion into wood products, we can assume that half of the log volume will go into sawnwood and the other half into wood panels or pulp. However we understand that in this methodology all of the sawlog volume should go into the sawnwood category, because for all wood products there is already either 19% or 24% going to wood waste, and so we would be double counting of that volume? Currently it is not clear to us how this should be accounted correctly.<br>Lastly on this point, we would question the relevance of the “other industrial wood” category, when it represents less than 10% of the total industrial wood flow globally according to FAO 2020 data. |
| **Response from Methodology Developer** | Agree that FAOSTAT data (which we are familiar with) now provide better resolution of end wood products, however, a study comparable to that of Winjum et al has not been produced since, and we have no way of knowing what retirement/oxidation rates are across the broader spectrum of "new" wood products. The wood waste fraction of a sawnlog is emitted immediately, and cannot enter accounting as another "type" like pulp. This is admittedly simplistic, intentionally (to align estimation effort to the significance of the long-term storage in harvested wood product pool). Accounting is driven solely on the basis of log volumes delivered to a processing facility, not later by volumes diverted among different product streams within a facility (which could produce double counting). |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |

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| **Comment Number** | 107 |
| **Commenter** | Miguel Fabra |

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| **Organization** | Stafford Capital Partners |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.4 |
| **Page** | 36 |
| **Public Comment** | Step 2<br>Perhaps this is less relevant, but the carbon fraction of the biomass (page 36) assigns a value 0.47 for all species, however IPCC Chapter 3: LUCF Sector good practice, Table 4.3, presents a more detailed subdivision which we consider more accurate: (STAKEHOLDER INCLUDED TABLE 4.3 IN THE PDF DOCUMENT) |
| **Response from Methodology Developer** | Do you suggest breaking it down by tree component? |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |

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| **Comment Number** | 108 |
| **Commenter** | Miguel Fabra |
| **Organization** | Stafford Capital Partners |
| **Date Received** | 1/28/22 |
| **Section** | 8.2.4 and 9.1 |

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| **Public Comment** | Step 3<br>In the methodology wood waste seems to be referred to in a very simplified and generalist way, at either 19% or 24%, when the referenced article (Winjum, J. et al 1998) states: ”However, the amount of wood waste accounted for 20% of the industrial roundwood consumed varied widely among the industrial countries considered here, from 11% to 56% for the four developing countries and from 25% to 51% for the four developed ones”. Furthermore, in the recent publication from FAO (https://www.fao.org/documents/card/en/c/ca7952en/) we can see that the distinction made between developed and developing countries, that perhaps made sense in 1998, no longer applies considering up to date data, as an example the following graphs:<br>(STAKEHOLDER INCLUDED TWO FIGURES IN THE PDF DOCUMENT)<br>These charts show for coniferous sawmilling that Chile and Ukraine (developing countries?) have higher sawnwood recovery (and hence lower waste or by-products) than Canada or Sweden (developed countries). The same is observable for non-coniferous sawnwood production (Nigeria versus Denmark for example).<br>Otherwise, we think that wood waste cannot be simplified to a single factor regardless of the wood processing industry. For example, in the sawnwood industry, the “wood waste” of the sawmilling, is just the raw material for other wood processing industries in the form of chips or sawdust, and the wood flows and conversion factors are very well documented in that same FAO publication:<br>(STAKEHOLDER INCLUDED TWO FIGURES IN THE PDF DOCUMENT)<br>Another issue we would like to raise is with the table of the OF parameter (page 44 of the methodology document based on Table 2 of Winjum et al. 1998). We agree on the different degradation that wood products suffer in different climates, however this should not be based on the country where the wood is harvested but rather where the wood product is going to be used. For example, Uruguay (tropical country) produces pulp, but 99% of this is exported to boreal and temperate countries, or New Zealand is another example of a country, very relevant in global timber production, which exports most as roundwood to other destinations. We feel there is sufficient FAO data on wood products trade to infer the proportion of wood products that will be used in different destinations (boreal, temperate, tropical) from that where the wood was harvested.<br>Another issue with the table of the OF parameter, is to see that sawnwood and paper have the same numbers (both being 0.38 and 0.62 in boreal and temperate respectively), which we are surprised at considering they are such different wood products with different end uses, mainly with the fact that a big share of sawnwood goes into structural use that lasts many decades on average; thus we suggest to review more than one, preferably updated (than 1998) data source to derive where currently the wood goes into which uses.<br>Regarding the annual oxidation factor, which has been brought from 95 years to the present. This doesn’t recognize that the average oxidation is in year 50, but it brings it to the present. We suggest it would be more accurate to follow an annual oxidation fraction, and then considered the remaining oxidation in the last year of the crediting period? This would give a more accurate recognition of the carbon storage role of the wood products during the 95 years period.<br>Another question where we would need clarity, is that in the Winjum et al. 1998 article, in the section on conversion factors, it adds the bark volume (0.12 in average), and whilst the VCS methodology is based on that, it is not clear if volumes should be over-bark or under-bark. I believe the wood waste figures then will make more sense if it is over-bark? But we would need a |

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| | clarification on this.<br>Finally, it would be very useful to have an example of the calculation for the Harvested Wood Products, similar to what you have in the leakage tool document for example, thus it might be easier for us to follow a real example. We have simulated the calculations in some of our forest carbon models in different geographies and species, but we are not sure if we are doing the calculations correctly. We can share them with you in case you have availability to review them, or otherwise perhaps we could have a call to demonstrate our calculations and go through the issues/questions raised here. |
| **Response from Methodology Developer** | The methodology deliberately avoids use of the annual decay functions for simplicity (to avoid the need to maintain an annual ledger of harvested wood products inputs and outputs, and allow accounting at the time of harvest). Agree on comments re wood waste and relevance of destination of end products. Vex,ty parameter now specified as "over bark." The Winjum et al 1998 paper is admittedly out of date. There are no recent comparable global estimates to drive a universal approach for accounting harvested wood products. |
| **Aster Global Findings - How the Developer took Due Account; resultant changes to the Methodology, and explain how these are appropriate.** | Removal of this HWP from the methodology is sufficient to address the commenter's concern. Item closed. |