



**Verified Carbon  
Standard**

# METHODOLOGY FOR IMPROVED FOREST MANAGEMENT, METHODOLOGY ASSESSMENT REPORT



**ASTER GLOBAL™**  
ENVIRONMENTAL SOLUTIONS

Aster Global Environmental Solutions, Inc.

|                             |  |
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## Summary

Aster Global Environmental Solutions, Inc., (Aster Global) was commissioned by The Nature Conservancy to perform the first assessment of the Methodology for Improved Forest Management in accordance with the VCS Methodology Approval Process, the VCS Program Guide v4.1, and the VCS Standard v4.2.

The Methodology “is applicable to a wide range of improved forest management (IFM) practices and employs standardized approaches for demonstration of additionality and derivation of project baselines to simplify the application of the methodology.

The focus of accounting is on estimation of GHG emissions and/or carbon stock change on permanent plots, not on estimation of stocks per se, therefore improving the precision of reported GHG emission reductions and/or removals.”

The purpose and scope of the new methodology assessment was to evaluate whether the methodology document was prepared in line with the VCS program requirements. Aster Global’s assessment included a detailed review of adherence to the VCS Methodology Approval Process, the VCS Program Guide, and the VCS Standard, 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 assessment also included a detailed analysis of the methodology, literature reviews, technical reviews and responses to all non-conformity reports (NCRs), clarifications (CLs), and opportunities for improvement (OFIs) based on the VCS rules and requirements.

The assessment team identified 60 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 A.

Aster Global confirms all methodology assessment activities, including objectives, scope and criteria, level of assurance and the methodology's adherence to the VCS Program and VCS Standard, as documented in this report, are complete. Aster Global concludes without any qualifications or limiting conditions that the Methodology for Improved Forest Management meets the requirements of VCS Rules and Requirements. 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 14064-3:2006). This report summarizes the findings of the first methodology assessment of the Verified Carbon Standard (VCS) methodology approval process framework. The Nature Conservancy, referred to as the “Methodology Developer”, commissioned Aster Global Environmental Solutions, Inc. (Aster Global), referred to as the “Assessment Team”, to perform an assessment of the Methodology.

This report presents the findings of a qualified assessment team of auditors and experts in methodologies for GHG emissions who have assessed the methodology for compliance with the applicable rules of VCS. Section 2.5 presents summary findings of the methodology assessment, and Appendix A provides details of individual findings.

## 1.2 Summary Description of the Methodology

This proposed methodology falls under Sectoral Scope 14 – Agriculture, Forestry, and Other Land Use (AFOLU); Improved Forest Management (IFM) category. The Methodology “is applicable to a wide range of improved forest management (IFM) practices and employs standardized approaches for demonstration of additionality and derivation of project baselines to simplify the application of the methodology.

The focus of accounting is on estimation of GHG emissions and/or carbon stock change on permanent plots, not on estimation of stocks per se, therefore improving the precision of reported GHG emission reductions and/or removals.”

For all activities, there is a quasi-experimental design, which matches pairs of treatments (project) and controls (baseline). Stock change is directly monitored in permanent sample units representing the project and baseline scenarios.

No forest growth and yield modeling is required to account for GHG emission reductions and/or removals for this methodology, which distinguishes it from other IFM methodologies.

# 2 ASSESSMENT APPROACH

## 2.1 Method and Criteria

This assessment is based upon standard auditing techniques in line with VCS 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 VCS documents used to assess the methodology revision were:

- VCS Program Guide (v4.1, 20 January 2022)
- VCS Standard (v4.2, 20 January 2022)
- VCS Program Definitions (v4.1, 20 January 2022)
- VCS Methodology Requirements (v4.1, 20 January 2022)
- Methodology Approval Process (v4.0, 19 September 2019)
- Validation and Verification Manual (v3.2, 19 October 2016)

## 2.2 Document Review

All documents reviewed in the methodological assessment are in Appendix B.

## 2.3 Interviews

The Assessment Team conducted interviews via its typical assessment channels of the opening meeting, methodology walkthrough, meetings to discuss findings, email exchanges, phone calls, and the closing meeting. During these meetings, the methodology development team was interviewed, including David Shoch, Technical Advisor at the TerraCarbon, Campbell Moore, Central Appalachians Director at The Nature Conservancy, David Ford, American Forest Foundation Senior Fellow, and Edie Sonne Hall, Founder and Principal at Three Trees Consulting. The interviews consisted of descriptions of the content and mechanisms of the methodology module and discussions of findings throughout the audit.

## 2.4 Assessment Team

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

Shawn McMahon – Lead Assessor and Verra-approved IFM Expert (Aster Global, [smcmahon@asterglobal.com](mailto:smcmahon@asterglobal.com)): 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 - VCS-Standardized Methods Expert/Assessment Team Member (Aster Global, btooleoneil@asterglobal.com): 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.

Matthew Perkowski – Assessment Team Member (Aster Global, mperkowski@asterglobal.com): Project Forester and Forest Biometrician. Responsibilities include meeting the internal and external client objectives in the fields of forest inventory and sampling, growth and yield modeling, and directly in support of offset validation/verification projects. In addition, he is focusing on streamlining and developing quantitative tools for the GHG group to increase product service value for clients.

Caitlin Sellers – Assessment Team Member (Aster Global, csellers@asterglobal.com): Senior Forester. Ms. Sellers has been involved in environmental, forest, wetland and wildlife projects for over 13 years and has specialized in forest carbon project auditing for 8 years. She is directly involved in validation and verification of forest carbon offsets and methodologies.

Taek Joo Kim – Assessment Team Member (Aster Global, tkim@asterglobal.com): Senior Forester and Forest Biometrician. Mr. Kim received a Ph.D. in Forest Biometrics from North Carolina State University with a Ph.D. Minor in Statistics & a Graduate Certificate for Geographic Information Systems (GIS) in 2015. He was previously a postdoctoral research fellow at the U.S. Forest Service Southern Research Station until 2016. Mr. Kim has been in forestry sector for a long time and has gained an extensive knowledge and multiple research experiences in a variety of areas in forestry, which includes ecology, physiology, silviculture, management, policy, economics, and modeling. As a broadly trained forest biometrician, he has expertise in forest modeling more specifically in spatial modeling and analysis.

Janice McMahon – QA/QC (Aster Global, jmcMahon@asterglobal.com). 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 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 5 formal rounds of evaluation by the assessment team and resulted in a Methodology version in conformance to VCS rules. Findings related to corrective action, clarification requests or other findings were resolved during communication between the assessment team and the methodology developer. More specifically, where noted by the assessment team, the methodology developer 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
- Internal consistency among modules 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 a module needed extra clarification to avoid ambiguity.

**Opportunities for Improvement (OFI)** were issued to the methodology developer when an opportunity for improvement was identified.

During the course of the methodology assessment, 60 findings (NCRs, CLs, and OFIs) were identified. Of those, Aster Global ensured *reasonable* assurance was provided to close 60 findings. Details on how each finding was closed can be found in Appendix A. Throughout the 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 A. The findings listed include methodology requirements, eligibility/applicability, leakage, measurement/monitoring, and quantification:

Performance benchmark: Section 2.3.4 of the Methodology Requirements allows for methodologies to use a performance benchmark for determining baseline and additionality.



Initial version(s) of the draft methodology did not clearly outline the performance benchmarks. Discussions with Verra ensued, and the final version of the Methodology included the required benchmarks in Sections 7, 8 and the Appendix.

The Assessment Team is assured the final version of the Methodology appropriately includes the required explanations for the performance benchmarks of baseline and additionality.

Leakage: Section 3.7.1 of the Methodology Requirements describes different leakage possibilities and requirements to ensure it is not happening within project ownership. Initial versions of the Methodology did not clearly distinguish between activity shifting and market leakage. Experts were consulted by the developer, and their results confirmed market leakage is inclusive of activity shifting leakage.

The Assessment Team is assured the final version of the Methodology includes the appropriate requirements to accurately capture both types of leakage.

Monitoring Procedures: Section 3.7.14, 2) requires monitoring procedures for leakage calculations. The Assessment Team noted that parameters were missing for commonly measured items, such as diameter or similar for volume/biomass equations. The developer updated the text for the relevant parameters, which resulted in appropriate inclusion of the necessary inputs needed to measure.

The Assessment Team is assured the final version of the Methodology includes the relevant definitions for appropriate leakage parameters.

## 3 ASSESSMENT FINDINGS

The proposed Methodology (v2, 11 April 2022) was found to be in compliance with the principles set out in the VCS Standard and other Verra rules and requirements. The new Methodology provides flexibility for 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 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

The following existing methodologies were considered similar by the developer and were reviewed to determine whether they could be reasonably revised to meet the objective of the subject Methodology.

| Methodology | Title   | Developer Comments  | Assessor Comments                                    |
|-------------|---|---|--|
| VM0003      | Methodology for Improved Forest Management through Extension of Rotation Age                  | Forest certification by FSC is required, and the methodology is applicable to only a subset of IFM activities.        | The Assessment Team confirms the Developer Comments. |
| VM0005      | Methodology for Conversion of Low-productive Forest to High-productive Forest                 | Only applicable in “evergreen tropical forest”.   | The Assessment Team confirms the Developer Comments. |
| VM0010      | Methodology for Improved Forest Management: Conversion from Logged to Protected Forest (LtPF) | Not applicable to working forests intended to remain as working forests (i.e., subject to commercial timber harvest). | The Assessment Team confirms the Developer Comments. |
| VM0011      | Methodology for Calculating GHG Benefits from Preventing Planned Degradation (LtPF)           | Not applicable to working forests intended to remain as working forests (i.e., subject to commercial timber harvest). | The Assessment Team confirms the Developer Comments. |
| VM0012      | Improved Forest Management in Temperate and Boreal Forests (LtPF)                             | Not applicable to working forests intended to remain as working forests (i.e., subject to commercial timber harvest). | The Assessment Team confirms the Developer Comments. |
| VM0034      | British Columbia Forest Carbon Offset Methodology   | Currently only applicable in British Columbia.  | The Assessment Team confirms the Developer Comments. |

|        |   |   |  |
|--------|---|---|--|
| VM0035 | Methodology for Improved Forest Management through Reduced Impact Logging | The proposed methodology will link to the RIL-C methodology, for which a U.S.-applicable performance method module is slated to be developed. | The Assessment Team confirms the Developer Comments. |
|--------|---|---|--|

During assessment, it was determined the Methodology provides a complete list of all similar methodologies, including CDM and Climate Action Reserve methodologies. The Assessment Team does not believe any existing methodology could have been reasonably revised to meet the objective of the current Methodology, and thus, the current Methodology is justified.

### 3.2 Stakeholder Comments

Public comments were received during the period of August 17 – September 16, 2020. Further, a webinar of this methodology was held on Wednesday, 02 September 2020, from 4:00 – 5:00 PM EDT and is available at <<https://verra.org/new-methodology-for-improved-forest-management-open-for-public-comment/>>.

Public Comments were received from 8 different organizations/individuals, including GreenTrees, LLC; State of Vermont; The Pacific Forest Trust; South Pole; Green Growth Consulting Firm; EP Carbon; SilviaTerra; and Conservation Northwest. In total, 8 comments were received, which were further subdivided into 41 sub-comments. The developer's responses were compiled and provided to the assessor in Excel format, and the assessor confirms the comments from each organization/individual were fully addressed by the developer and confirmed to be appropriately reflected in the methodology document.

The comments cover a wide variety of aspects of fundamentals related to the methodology design, some of which were addressed through adherence to the VCS Standard during the assessment process. These include project length & crediting period; reversal & permanence; uncertainty calculation/determination; baseline/project plots selection; definition of project landowners/area; and including additional clarification to the methodology document.

Aster Global has reviewed all comments and responses and determined that the methodology developer has provided detailed and sufficient responses to address all comments provided in the public comment period. The developer took due account of each comment, and appropriate changes, revisions, and edits occurred to methodology document as a result. A complete review of all public comments, including the developer's response and the assessor's findings, can be found in Section 8 (Appendix B) of this report.

### 3.3 Structure and Clarity of Methodology

Through the methodology assessment process, the Assessment Team ensured the Methodology is written in a clear, logical, concise and precise manner in accordance with the Methodology Approval Process (v4.0, 19 September 2019).

- 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. At least one Finding was issued related to the Methodology's consistency with the template, and all Findings were resolved to ensure VCS requirements were achieved.
- 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 Assessment Team's overall read, interpretation, and review process.
- 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 the relevant project type. 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 are presented clearly and appropriately in the Definitions Section 3 at the beginning of the document by the methodology developers for ease of use. The 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 assessment determined the applicability conditions contained within the methodology are appropriate, adequate, and in compliance with the VCS Standard and other rules.

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 summary shows applicability conditions as written, changes made during the revision of the methodology, and the final evaluation of those changes during the assessment:

The methodology is applicable under the following conditions:

1. “The project activity must qualify as forests remaining as forests, and involve an intervention expected to achieve improved net carbon emission outcomes relative to business-as-usual practices (including but not limited to extended rotations/cutting cycles, designating reserves, fuel load treatments to mitigate fire risk, enrichment planting, release of natural regeneration via management of competing vegetation, stand irrigation and/or fertilization).”

Assessment:

This applicability condition is the basic condition for IFM projects that “the baseline and project scenarios for the project area shall qualify as forests remaining as forests” as stated in A1.3 of the VCS Standard v4.2. Therefore, this applicability condition is appropriate for the project activities targeted by the methodology, and the inclusion is deemed appropriate.

The Assessment Team concludes the applicability condition is written in a sufficiently clear and precise manner, such that it can be determined whether a project activity meets with the condition; and conformance with the applicability condition can be demonstrated at the time of project validation.

2. “The methodology is applicable in national or sub-national jurisdiction where approved data sources, and matching covariates and procedures in which they occur, are specified in an appendix to the methodology.”

Assessment:

This applicability condition states the requirements for baseline plots. The methodology depends on existing dataset for baseline determination, thus by “approved data sources”, the integrity of source of the dataset is ensured, and by “matching covariates and procedures”, the eligibility conditions of baseline plots are set out. Both terms establish the scope of validity of the methodology.

Therefore, this applicability condition is appropriate for the project activities targeted by the methodology, and the inclusion is deemed appropriate.

The Assessment Team concludes the applicability condition is written in a sufficiently clear and precise manner, such that it can be determined whether a project activity meets with the condition; and conformance with the applicability condition can be demonstrated at the time of project validation.

This methodology is not applicable under the following conditions:

1. “Where the project activity involves reducing the frequency and/or intensity of timber harvest *and* the project area is subject to any pre-existing legal encumbrance specifically restricting timber harvest.”

Assessment:

A1.3 of the VCS Standard v4.2 states that “Eligible IFM activities are those that increase carbon sequestration and/or reduce GHG emissions on forest lands managed for wood products such as sawtimber, pulpwood and fuelwood by increasing biomass carbon stocks through improving forest management practices,” and the Standard strictly requires that lands participating in IFM activities are not subject to any form of activities or constraints increasing carbon sequestration and/or reducing GHG emissions before project initiation. As per A1.3 of the VCS Standard v4.2, this applicability condition defines eligibility conditions of participating lands and restricts the use of the methodology to lands where project activities reduce the frequency and/or intensity of timber harvest or pre-existing legal encumbrance limits timber harvest. Therefore, the Methodology restricts activities under this exclusion, and their exclusion under this condition is deemed appropriate.

2. “Where the project activity involves a change in hydrology and/or soil disturbance exceeding 10% of the project area. The methodology is not applicable to Wetland Restoration and Conservation (WRC) activities.”

Assessment:

Initially, the Methodology did not explicitly exclude WRC activities, but this was one of the changes made during the revision of the Methodology, as a result of the Assessment Team’s review.

This applicability condition ensures that “the baseline and project scenarios for the project area shall qualify as forests remaining as forests” as stated in the A1.3 of the VCS Standard v4.2; and restricts project areas so that “forests remaining as forests” are not impacted by hydrological and/or soil disturbances as per the 3.10.4.3) of VCS Standard v4.2 that “Where projects are hydrologically connected to adjacent areas that may have a negative impact on the hydrology within the project area, projects shall demonstrate that such impacts will not result in a significant increase in GHG emissions.” Therefore, the Methodology

restricts activities under this exclusion, and their exclusion under this condition is deemed appropriate.

3. “Where the project activity involves any deliberate reduction in lying dead wood stocks that is expected to exceed 5% of net emission reductions.”

Assessment:

- 1) This applicability condition is included to ensure that lying dead wood stocks are excluded from the project boundary. As per “Table 2: Carbon Pools to be considered in Methodologies” in the Methodology Requirements v4.1, dead wood pool shall be included, or it is optional. Dead wood pool is restricted to standing dead wood, but lying dead wood is conservatively excluded within the methodology. Therefore, the Methodology restricts activities under this exclusion, and their exclusion under this condition is deemed appropriate.

### 3.6 Project Boundary

The VCS Standard requires 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 (Table 5.1) of baseline and with-project carbon pools. The assessment team’s comments are included below:

| Source                             | Included?                       | Justification/Explanation  | Assessment Team’s Comments  |
|------------------------------------|---------------------------------|--|---|
| Aboveground tree biomass           | Yes                             | Required pool. Expected to be subject to significant change due to the project activity. | This required source is appropriately included, as it is THE major pool subject to change during the project activities.                                  |
| Aboveground woody non-tree biomass | Conditional on project activity | Must be included where subject to significant change due to the project activity.        | This source is conditionally allowed, as it is conservative to include it if/when there is a major change to the pool affecting GHG emissions/reductions. |

| Source                                  | Included? | Justification/Explanation   | Assessment Team's Comments   |
|---|-----------|---|--|
| Aboveground non tree herbaceous biomass | No        | Not required due to insignificance.   | This source is appropriately excluded, as aboveground non-tree biomass would generally not change from baseline to project scenarios. VCS rules deem this appropriate, and the source's specification in the methodology is clear.                         |
| Belowground biomass                     | Yes       | Expected to be subject to significant change due to the project activity.                           | This source is an optional pool allowed in the Methodology Requirements. The Methodology Developer has deemed this a major source, subject to significant change due to the project activities. The Assessment Team agrees with the developer's assertion. |
| Dead wood                               | Yes       | Required pool. Accounting boundary restricted to standing dead wood (lying dead wood not included). | This source is allowed or optional depending on the project sub-type. The Assessment Team finds the inclusion of this source is in line with the Methodology Requirements and intent of the Methodology.   |



| Source              | Included? | Justification/Explanation  | Assessment Team's Comments  |
|---------------------|-----------|--|---|
| Litter              | No        | Not required due to insignificance.  | This source is not allowed in the Methodology Requirements. The Assessment Team finds the exclusion of this source is in line with the Methodology Requirements.  |
| Soil organic carbon | No        | Not expected to be subject to significant change due to the project activity.  | This source is not allowed or optional depending on the project sub-type. The Assessment Team finds the exclusion of this source is in line with the Methodology Requirements.  |
| Wood products       | Yes or No | Required pool, except where the project activity involves Reduced Impact Logging (RIL) with no or minimal (<25%) effect on total timber extracted, in which case wood products must not be included. | This source is not allowed, allowed, or optional depending on the project sub-type. The Assessment Team finds the exclusion of this source for RIL projects and inclusion for other sub-types is in line with the Methodology Requirements. |

Additionally, the methodology provides a clear diagram (Table 5.2) of baseline and with-project carbon sources. The assessment team's comments are included below :

| Source | Gas | Included? | Justification/Explanation | Assessment Team's Comments |
|--------|-----|-----------|---------------------------|----------------------------|
|--------|-----|-----------|---------------------------|----------------------------|

| Baseline and Project | Emissions from nitrogen-containing soil amendments or from decomposition of plant materials with fixed nitrogen. | CO <sub>2</sub>  | N/A                             |  | The Assessment Team finds this source to be appropriately not applicable and thus excluded.               |
|----------------------|--|------------------|---------------------------------|--|---|
|                      |  | CH <sub>4</sub>  | N/A                             |  | The Assessment Team finds this source to be appropriately not applicable and thus excluded.               |
|                      |  | N <sub>2</sub> O | Conditional on project activity | N <sub>2</sub> O emissions from nitrogen-containing soil amendments are included in the scenario where nitrogen fertilizer is applied as part of the project activity. N <sub>2</sub> O emissions are conservatively set to zero in the baseline.  | The Assessment Team finds this source to be appropriately included or conservatively excluded.            |
|                      |  | Other            | N/A                             |  | The Assessment Team finds this source to be appropriately not applicable and thus excluded.               |
|                      | Burning of tree biomass (emissions from burning non tree biomass not included - de minimis)                      | CO <sub>2</sub>  | Conditional on project activity | CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O emissions from fire are included in the baseline and project scenario where incidence and/or severity of fires is impacted by the project activity (e.g., in the project scenario where the project activity involves burning woody biomass, or in the project and baseline scenarios where the project activity is aimed at altering the probability and/or magnitude of emissions from forest fires). | The Assessment Team finds this source to be appropriately included in the project and baseline scenarios. |
|                      |  | CH <sub>4</sub>  | Conditional on project activity |  | The Assessment Team finds this source to be appropriately included in the project and baseline scenarios. |
|                      |  | N <sub>2</sub> O | Conditional on project activity |  | The Assessment Team finds this source to be appropriately included in the project and baseline scenarios. |
|                      |  | Other            | N/A                             |  | The Assessment Team finds this source to be appropriately not   |

|                         |                  |          |            |  |   |
|-------------------------|------------------|----------|------------|--|---|
|                         |                  |          |            |  | applicable and thus excluded.   |
| Burning of fossil fuels | CO <sub>2</sub>  | Excluded | De minimis |  | The assertion of this fossil fuel being de minimis is confirmed by the Assessment Team. |
|                         | CH <sub>4</sub>  | Excluded | De minimis |  | The assertion of this fossil fuel being de minimis is confirmed by the Assessment Team. |
|                         | N <sub>2</sub> O | Excluded | De minimis |  | The assertion of this fossil fuel being de minimis is confirmed by the Assessment Team. |
|                         | Other            | Excluded | De minimis |  | The assertion of this fossil fuel being de minimis is confirmed by the Assessment Team. |

### 3.7 Baseline Scenario

The Methodology applies a performance benchmark approach for the determination of the baseline scenario. Composite baselines derived from national or sub-national forest inventory are sourced for a group of constituent points. These points are then matched to project samples using an optimal matching approach to weight impact of each relevant plot. The baseline data are updated as newer inventory data from the national or sub-national forest inventories are available throughout the life of the project.

The assessment team reviewed the approach for the derivation of the baseline scenario and confirm that the approach is sound and appropriate for the activities covered by the methodology. Further, the assessment team examined selection criteria for sample plots in the baseline and confirm that the approach is sound and in line with professional standards.

The performance benchmark is appropriate as national or sub-national forest inventories in similar areas outside of the project are sourced for the determination of the “business as usual” case. The assessment team confirmed that under this approach, the composite baseline would be updated as newer data are available ensuring that the comparison is done in near real time. This ensures that unlike other approaches where baseline common practice or historical management practices are used to determine a baseline that predicts

into the future, that under this approach the baseline will effectively update itself and always reflect the common practice in the region.

Appendix A includes the performance method for the United States. The Assessment team reviewed the process for the determination of composite baseline plots derived from the USDA Forest Service Forest Inventory Analysis (FIA) data and confirm that approach is sound and in line with sound professional practices. The USDA Forest Service FIA data is a recognized standard for forest data within the United States and appropriate for the determination of a “business as usual” case.

### 3.8 Additionality

The Methodology uses a performance method for additionality demonstration. The Methodology requires the project to demonstrate additionality via regulatory surplus in accordance with the VCS Methodology Requirements. Additionally, projects must establish a performance benchmark using Equation 1 outlined in the methodology.

The Methodology utilizes a performance benchmark for additionality. The benchmark compares project monitored plots to dynamic composite baseline plots, representing the baseline scenario. These plots are located outside of the project area and derived from national or sub-national forest inventory plots. For a given year, when calculated emissions reductions exceed the baseline scenario, they are deemed additional. The assessment team examined the defined approach and confirmed that it is appropriate for determination of additionality, as the project is only deemed additional in years where the project values emissions reductions exceed those in the comparable real-time baseline case.

Appendix A includes the performance method for the United States. The Assessment team reviewed the process for the determination of composite baseline plots derived from the USDA Forest Service Forest Inventory Analysis (FIA) data and confirm that approach is sound and in line with sound professional practices. The USDA Forest Service FIA data is a recognized standard for forest data within the United States and appropriate for the determination of a “business as usual” case.

## 3.9 Quantification of GHG Emission Reductions and Removals

### 3.9.1 Baseline Emissions

The baseline applies a performance method to determine measured stock change based on composite baselines. Project samples are compared to corresponding paired baseline plots for the determination of net GHG emission reductions and removals. The methodology provides detail to determine annualized stock changes for the baseline emissions and removals. These emissions and removals are updated in-line with remeasurement specified

in the performance method, with samples that are remeasured over project lifespan. The assessment team confirmed that procedures are provided for calculating project emissions and removals for all applicable pools when applied. The assessment team thoroughly reviewed all equations, formula and related parameters and determined them to be free from error. The parameters outlined for use in the computation of this quantification method include sufficient detail to determine parameters or apply default factors based on appropriate sources.

Additionally, the assessment team reviewed the performance method for the United States in Appendix A of the methodology. The audit team reviewed the procedures related to baseline generation in the United States under the performance method and confirm that the approach is appropriate. Further, the assessment team reviewed related calculations on confirmed them to appropriate and free from error. The assessment team also assesses related parameters and confirmed sufficient detail and appropriate sources.

### 3.9.2 Project Emissions

The methodology provides detail to determine annualized stock changes for the project emissions and removals. These emissions and removals are determined through samples that are remeasured throughout the project lifespan. The assessment team reviewed the approach for determining stock changes and confirm that the approach is sound and in line with accepted professional practices. The assessment team also confirmed that procedures are provided for calculating project emissions and removals for all applicable pools when applied. The assessment team thoroughly reviewed all equations, formula and related parameters and determined them to be free from error. The parameters outlined for use in the computation of this quantification method include sufficient detail to determine parameters or apply default factors based on appropriate sources.

### 3.9.3 Leakage

Leakage is calculated based on a combination of activity shifting leakage and market leakage for the methodology. This is done using Equation 10 of the methodology, as follows.

$$LK_t = \text{MIN} \left( 0, A_t \times \frac{1}{n} \sum_{i=1}^n \left( L\text{Removed}_{wp,i,t} - \sum_{j=1}^n (L\text{Removed}_{bsl,i,j,t} \times W_{bsl,i,j}) \right) \times LF_t \right)$$

The assessment team confirmed that the approach applied is consistent with the requirements set out in the Verra Standard for AFOLU projects and appropriately applies market leakage discount factors, in line with values from Table 3 of the Standard.

### 3.9.4 Net GHG Emission Reductions and Removals

The calculations of net GHG emission reductions and removals are computed using Equation 11 of the methodology, as follows.

$$ER_t = (A_t \times \overline{ER}_t + LK_t) \times (1 - UNC_t)$$

The computation is appropriate in incorporating all potential sources of GHG emissions and removals, as defined in the project boundary tables, while also incorporating leakage and uncertainty. The assessment team confirms that the equation is free from error and correctly computes GHG emission reductions and removals.

The assessment team confirmed that the methodology outlines the computation of uncertainty. Combined uncertainty is computed using Equation 13 of the methodology as follows:

$$UNC_t = \left( \min \left( 100\%, \max \left( 0, T \times \left( \frac{1}{n} \times s_{wp,t}^2 + \frac{1}{n} \times \sum_{j=1}^c \sum_{i=1}^n (W_{bsl,i,j}^2 \times s_{bsl,t}^2) \right)^{\frac{1}{2}} \times \left( \frac{1}{\overline{ER}_t} \right) - 15\% \right) \right) \right)$$

The assessment team confirmed that the uncertainty, displayed above, is appropriate.

### 3.10 Monitoring

The data and parameters available at validation and monitored are all derived based on project activities covered by the methodology to develop equations for quantifying net GHG emission reductions and removals. They are essential for each equation covered by the methodology and appropriately included in each equation. The monitoring plan is developed accordingly to ensure that procedures to measure the data and parameters achieve a certain level of assurance. The integrity of for each monitoring data and parameters is attained through the reporting of following information in the monitoring plan, e.g. sampling design, data collection methods, frequency of monitoring, and QA/QC procedures. The assessment determines that data, parameters, and procedures for monitoring are appropriate for the project activities covered by the methodology, and therefore, ensuring that net GHG emission reductions and removals are monitored and reported appropriately.

An assessment and a justification for the appropriateness of each monitoring data and parameter is provided in the following tables.

- Data and Parameters Available at Validation

| Data/Parameter | Assessment Team Findings |
|----------------|--------------------------|
|----------------|--------------------------|

|               |  |
|---------------|--|
| $SF^*_{,wt}$  | <p>This is the mass remaining stored in-use and landfills over 100 years, measured as dimensionless. The purpose of this parameter is to measure the approximate annual climate benefit of preventing carbon from entering the atmosphere by a quantified amount each year for 100 years which is used in the quantification of the baseline and project emissions, which is appropriate. The source of the data is Table 6-A-5 from Hoover, Coeli; Richard Birdsey; Bruce Goines; Peter Lahm; Gregg Marland; David Nowak; Stephen Prisley; Elizabeth Reinhardt; Ken Skog; David Skole; James Smith; Carl Trettin; and Christopher Woodall. 2014 Chapter 6: Quantifying Greenhouse Gas Sources and Sinks in Managed Forest Systems. In Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory. Technical Bulletin Number 1939. USDA. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p> |
| $A_t$         | <p>This is the proposed project area, measured as unit of area. It is appropriately calculated from GIS data at <math>t=0</math>. The purpose of the data is for reference for other area measures. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>   |
| $W_{bsl,i,j}$ | <p>This is the weight of constituent baseline plot <math>j</math> in matched composite baseline <math>i</math>, measured as dimensionless (a value between 0 and 1). This parameter is calculated as described in Appendix A of the methodology where weights are derived to produce an optimal match to the pair project sample unit in terms of one or more specified initial condition covariates. The purpose of the data is for the quantification of baseline emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>  |
| $GWP_g$       | <p>This is the Global warming potential for gas <math>g</math>, measured as dimensionless. The source is the IPCC Fourth Assessment Report (100-year GWP), unless otherwise directed by VCS. This datum will be used for calculation of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>   |

|                |   |
|----------------|---|
| $C_f$          | <p>This is the proportion of pre-fire fuel biomass consumed as a combustion factor for forest type <math>f</math>. The purpose of the parameter is quantification of baseline and project emissions. This datum is derived from IPCC guidelines and is in accordance with VCS rules. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>   |
| $EF_g$         | <p>This is the emission factor for gas <math>g</math>, measured as <math>g\ kg^{-1}</math> dry matter burnt. It will be used in baseline and project emissions calculation in line with VCS requirements. This datum is derived from IPCC guidelines and is in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>  |
| $EF_{Ndirect}$ | <p>This is the emission factor for direct nitrous oxide emissions from N additions from synthetic fertilizers, organic amendments, and crop residues, measured in <math>t\ N_2O-N</math> per <math>t\ N</math> applied (<math>t\ N_2O-N/t\ N</math> applied). The datum is derived from the 2019 IPCC Guidelines (a value of 0.01 is applied) and is in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p> |
| $Fra_{CGASF}$  | <p>This is the fraction of all synthetic N added to soils that volatilizes as <math>NH_3</math> and <math>NO_x</math>, measured as dimensionless. This datum is derived from IPCC guidelines (a value of 0.1 is applied), in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>  |
| $Fra_{CGASM}$  | <p>This is the fraction of all organic N added to soils that volatilizes as <math>NH_3</math> and <math>NO_x</math>, measured as dimensionless. This datum is derived from IPCC guidelines (a value of 0.3 is applied), in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>  |
| $EF_{Nvolat}$  | <p>This is the emission factor for nitrous oxide emissions from atmospheric deposition of N on soils and water surfaces,</p>  |



|                             |   |
|-----------------------------|---|
|                             | <p>measured as <math>t \text{ N}_2\text{O-N} / (t \text{ NH}_3\text{-N} + \text{NO}_x\text{-N volatilized})</math>. This datum is derived from IPCC guidelines (a value of 0.01 is applied) and is in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>   |
| $\text{Fra}_{\text{LEACH}}$ | <p>This is the dimensionless fraction of N added (synthetic or organic) to soils and that is lost through leaching and runoff. This datum is derived from IPCC guidelines (a value of 0.3 is applied) and is in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p>   |
| $\text{EF}_{\text{Nleach}}$ | <p>This is the emission factor for nitrous oxide emissions from leaching and runoff, measured as <math>t \text{ N}_2\text{O-N} / t \text{ N leached and runoff}</math>. This datum is derived from IPCC guidelines (a value of 0.0075 is applied) and is in accordance with VCS rules. The purpose of the parameter is quantification of baseline and project emissions. The data unit, source, value applied, and purpose of data are consistent with VCS rules.</p> |

- Data and Parameters Monitored

| Data/Parameter   | Assessment Team Findings   |
|--|--|
| $X_{\text{bsl},i,j,mt}, X_{\text{wp},i,t}$                       | <p>This is the length of the measurement interval ending at time <math>mt</math> for constituent baseline plot <math>ij</math> and the length of the measurement interval ending at time <math>t</math> for sample unit <math>i</math> in the project scenario, measured in years. This is a calculated value based on when the inventory plot was measured and is derived from the plot data. The purpose of the parameters is quantification of baseline and project emissions. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |
| $\text{LAG}_{\text{wp},i,t}$ and $\text{LAG}_{\text{bsl},i,j,t}$ | <p>This is the live aboveground biomass stocks in the project scenario at sample unit <math>i</math> at time <math>t</math> and live aboveground biomass stocks in the baseline scenario at constituent</p>  |

|  |   |
|--|---|
|  | <p>baseline plot <math>j</math> of composite baseline <math>i</math> at time <math>t</math>, measured in t CO<sub>2e</sub> per unit area. The purpose of the parameters is quantification of baseline and project emissions. These parameters are derived from plot-based sampling using a range of techniques, but the sampling approach used must be unbiased and derived from representative sampling, adhere to best practices for quality assurance/quality control (QA/QC) procedures, and apply fixed dbh and any other size thresholds. Additionally, these parameters are required to use published allometric equations. The initial measurement must occur at or precede time <math>t=0</math> and must be remeasured every 5 years or less in the project scenario and every 10 years or less in the baseline scenario. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>  |
| $LBG_{wp,i,t}$ and $LBG_{bsl,i,j,t}$             | <p>This is the live belowground biomass stocks in the project scenario at sample unit <math>i</math> at time <math>t</math> and live belowground biomass stocks in the baseline scenario at constituent baseline plot <math>j</math> of composite baseline <math>i</math> at time <math>t</math>, measured in t CO<sub>2e</sub> per unit area. The purpose of the parameters is quantification of baseline and project emissions. These parameters are derived using published component ratios based on live aboveground biomass measurements from plot-based sampling using a range of techniques, but the sampling approach used must be unbiased and derived from representative sampling, adhere to best practices for quality assurance/quality control (QA/QC) procedures, and apply fixed dbh and any other size thresholds. Additionally, these parameters are required to use published allometric equations. The initial measurement must occur at or precede time <math>t=0</math> and must be remeasured every 5 years or less in the project scenario and every 10 years or less in the baseline scenario. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |
| $LTremoved_{wp,i,t}$ and $LTremoved_{bsl,i,j,t}$ | <p>This is the live tree biomass stocks removed in the project scenario at sample unit <math>i</math> subject to harvest in the monitoring interval ending at time <math>t</math> and live tree biomass stocks in the</p>   |

|                                    |  |
|------------------------------------|--|
|                                    | <p>baseline scenario at constituent baseline plot <math>j</math> in composite baseline <math>i</math> subject to harvest in the monitoring interval ending at time <math>t</math>, measured in t CO<sub>2</sub>e per unit area. These parameters are derived from measurements of permanent sample plots in the project area or on without-treatment (baseline) sites and estimated via pre- and post-harvest cruises. The initial measurement must occur at or precede time <math>t=0</math> and must be remeasured every 5 years or less in the project scenario and every 10 years or less in the baseline scenario. The purpose of these parameters is the determination of leakage. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>  |
| $DW_{wp,i,t}$ and $DW_{bsl,i,j,t}$ | <p>This is the dead wood biomass stocks in the project scenario at sample unit <math>i</math> at time <math>t</math> and dead wood biomass stocks in the baseline scenario at constituent baseline plot <math>j</math> of composite baseline <math>i</math> at time <math>t</math>, measured in t CO<sub>2</sub>e per unit area. The purpose of the parameters is quantification of baseline and project emissions. Standing dead wood estimates are derived from plot-based sampling using a range of techniques. Lying dead wood estimates are derived from line intersect sampling, perpendicular distance sampling, or other unbiased approaches. All sampling approaches used must be unbiased and derived from representative sampling, adhere to best practices for quality assurance/quality control (QA/QC) procedures, and apply fixed size thresholds. Standing deadwood must be quantified for each standing dead tree where stem volume is estimated using published volume equations (species-, or genus- or family-specific, in order of preference from higher to lower, as available) using at a minimum dbh and remaining stem height and applying density reduction factors referencing decomposition states. Standing dead wood biomass is restricted to aboveground stem (bole) biomass. Biomass of lying dead wood must be estimated from sampled volumes using published wood densities (species-, or genus- or family-specific, in order of preference from higher to lower, as available) and density reduction factors referencing decomposition states. The initial measurement must occur at</p> |

|   |  |
|---|--|
|   | <p>or precede time <math>t=0</math> and must be remeasured every 5 years or less in the project scenario and every 10 years or less in the baseline scenario. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>   |
| <p><math>BBremoved_{saw,wt,bsl,i,j,t}</math><br/>and<br/><math>BBremoved_{saw,wt,wp,i,t}</math></p>   | <p>This is the saw log bole biomass stocks in wood type <math>wt</math> (<math>wt</math> = softwood (sfw) or hardwood (hwd)) in commercial species removed in the baseline scenario at constituent baseline plot <math>j</math> in composite baseline <math>i</math> subject to harvest in the monitoring interval ending at time <math>t</math> and saw log bole biomass stocks in wood type <math>wt</math> (<math>wt</math> = softwood (sfw) or hardwood (hwd)) in commercial species removed in the project scenario at sample unit <math>i</math> in the monitoring interval ending at time <math>t</math>, measured in t CO<sub>2</sub>e per unit area. The purpose of the parameters is quantification of baseline and project emissions. The source of data is measurements derived from permanent plots subject to harvest in the monitoring interval ending at time <math>t</math> where saw logs are distinguished from pulpwood on the basis of dbh (softwood saw logs are trees with a minimum dbh of 22.9 cm (9 in) and hardwood saw logs are trees with a minimum dbh of 27.9 cm (11 in)). Bole biomass can be derived based on measurements using two different approaches 1: bole biomass is estimated by applying published volume equations and wood densities or 2: bole biomass is estimated by applying a published stem component ratio to total aboveground biomass estimated applying published allometric equations. The initial measurement must occur at or precede time <math>t=0</math> and must be remeasured every 5 years or less in the project scenario and every 10 years or less in the baseline scenario. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |
| <p><math>BBremoved_{pulp,wt,bsl,i,j,t}</math><br/>and<br/><math>BBremoved_{pulp,wt,wp,i,t}</math></p> | <p>This is the pulpwood bole biomass stocks in wood type <math>wt</math> (<math>wt</math> = softwood (sfw) or hardwood (hwd)) in commercial species removed in the baseline scenario at constituent baseline plot <math>j</math> of composite baseline <math>i</math> in the monitoring interval ending at time <math>t</math> and pulpwood bole biomass stocks in wood type <math>wt</math> (<math>wt</math></p>  |

|                  |   |
|------------------|---|
|                  | <p>= softwood (sfw) or hardwood (hwd)) in commercial species removed in the project scenario at sample unit <math>i</math> in the monitoring interval ending at time <math>t</math>, measured in t CO<sub>2e</sub> per unit area. The purpose of the parameters is quantification of baseline and project emissions. The source of data is measurements derived from permanent plots subject to harvest in the monitoring interval ending at time <math>t</math> where pulpwood is identified on the basis of dbh (softwood pulpwood are trees with a dbh between 12.7 cm (5 in) and 22.8 cm (8.9 in) and hardwood pulpwood are trees with a dbh between 12.7 cm (5 in) and 27.8 cm (10.9 in). Bole biomass can be derived based on measurements using two different approaches 1: bole biomass is estimated by applying published volume equations and wood densities or 2: bole biomass is estimated by applying a published stem component ratio to total aboveground biomass estimated applying published allometric equations. The initial measurement must occur at or precede time <math>t=0</math> and must be remeasured every 5 years or less in the project scenario and every 10 years or less in the baseline scenario. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |
| $M_{wp,SF,i,t}$  | <p>This is the mass of project N containing synthetic fertilizer applied for sample unit <math>i</math> in year <math>t</math>, measured as t fertilizer per unit area. This parameter is derived from application records which are substantiated by one or more forms of documented evidence pertaining to the selected sample unit and relevant monitoring period (e.g. management logs, receipts, or invoices). The purpose of the parameter is the calculation of project emissions. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>  |
| $NC_{wp,SF,i,t}$ | <p>This is the N content of project synthetic fertilizer applied measured as t N/t fertilizer. This parameter is derived from the fertilizer manufacturer's specifications. The purpose of the parameter is the calculation of project emissions. The data unit, source, measurement methods and procedures to</p>  |

|                  |  |
|------------------|--|
|                  | be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.  |
| $M_{wp,OF,i,t}$  | This is the mass of project N containing organic fertilizer applied for sample unit $i$ in year $t$ , measured as $t$ fertilizer per unit area. This parameter is derived from application records which are substantiated by one or more forms of documented evidence pertaining to the selected sample unit and relevant monitoring period (e.g. management logs, receipts, or invoices). The purpose of the parameter is the calculation of project emissions. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules. |
| $NC_{wp,OF,i,t}$ | This is the N content of project organic fertilizer applied measured as $t$ N/ $t$ fertilizer. This parameter is derived from peer-reviewed published data. The purpose of the parameter is the calculation of project emissions. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.   |

- Data and Parameters Available at Validation for Project Sample Units from Appendix A

| <b>Data/Parameter</b>                            | <b>Assessment Team Findings</b>  |
|--|--|
| Distance to sample (treatment/project case) unit | This is the distance to sample (treatment/project case) unit, measured in kilometers. This parameter is calculated using a GIS analysis of geo-referenced locations where the sample unit centers are geo-referenced in the field using a GPS (latitude/longitude) and “fuzzed” (uncorrected) locations of FIA plots recorded in the FIADB. Where a 2-stage sample is used, the relevant location is the centroid of the primary unit. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules. |

|                       |   |
|-----------------------|---|
| STDAGE                | <p>This is the stand age, measured in years. This parameter is derived from an average of 3 or more increment cores (within each sampling unit) taken at breast height from sampled trees that are greater than or equal to five inches and not overtopped, obtained via plot-based sampling and is calculated as age at breast height plus the number of years that passed from germination until the tree reached the point of core extraction. The number of years that passed from germination until the tree reached the point of core extraction is five years for all eastern species, five years for all western hardwood species, and 10 years for all western softwood species. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>   |
| SITECLCD              | <p>This is the site productivity class code using FIA Classes (1-7), measured in cubic feet per acre per year (cubic feet/acre/year). This parameter will be derived from the NRCS Web Soil Survey Database. The NRCS Web Soil Survey Database requires the use of a location to determine SITECLCD. The location is the center of the sample unit location or if a 2-stage sample is used SITECLCD is the area-weighted average value for the primary unit. Additionally, the SITECLCD selected from the NRCS Web Soil Survey Database output is identified as the SITECLCD for a specific species which corresponds to the available tree species with the highest relative basal area (determined from plot-based sampling. If a map unit has &lt;NULL&gt; site productivity values, the SITECLCD is sourced from the map unit nearest to the project sample unit with site productivity values. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |
| Regeneration stocking | <p>This is the Total Relative Density per acre of all live, commercial trees (species not included in species groups</p>  |

|                     |  |
|---------------------|--|
|                     | <p>23, 43, and 48 as defined by the FIA User's Guide Appendix E) greater than or equal to 1 inch and less than 5 inches in dbh, measured as dimensionless. This value is derived from plot-based sampling and calculated using the equation described in Appendix A of the methodology and then summed for the sample unit. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>  |
| Commercial stocking | <p>This is the Total Relative Density per acre of all live, commercial trees (species not included in species groups 23, 43, and 48 as defined by the FIA User's Guide Appendix E) greater than or equal to 5 inches in dbh, measured as dimensionless. This value is derived from plot-based sampling and calculated using the equation described in Appendix A of the methodology and then summed for the sample unit. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |
| ELEV                | <p>This is the elevation, measured in feet (10 or 100 foot categories), and derived from a GPS or digital elevation model. Elevation is determined for the sample unit location (center) or if a 2-stage sample is used is calculated as the average value for the secondary units. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>  |
| SLOPE               | <p>This is the slope, measured as a percent, and derived from a digital elevation model or plot-based sampling as the sample unit average slope using a hypsometer or clinometer. Where a digital elevation model is used to determine the slope, the parameter is identified for the sample unit location or if a 2-</p>  |



|                                |  |
|--------------------------------|--|
|                                | <p>stage sample is used the area-weighted average value for the primary unit is used. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>  |
| <p>Quadratic mean diameter</p> | <p>This is the diameter of tree with average basal area, measured in inches to the nearest 0.1 inches. This parameter is derived from plot-based sampling using only live trees greater than or equal to five inches in dbh. The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p>   |
| <p>RDDISTCD</p>                | <p>This is the horizontal distance to an improved road, measured as a code (0 to 9). This parameter is derived from GIS analysis and calculated as the shortest straight line from the sample unit center to the nearest improved road. An improved road is defined as a road of any width that is maintained which is evidenced by pavement, gravel, grading, ditching, and/or other improvements. If a 2-stage sample is used the relevant location is the centroid of the primary unit (stand). The purpose of the data is for obtaining matches of the composite baselines from USFS FIA plots. The data unit, source, measurement methods and procedures to be applied, frequency of monitoring, QA/QC procedures, calculation method, and purpose of data are consistent with VCS rules.</p> |

Based on the findings of each data/parameter required in this methodology, the Assessment Team concludes that monitoring procedures for the methodology are appropriate, adequate and in compliance with the VCS rules and requirements. In addition, the monitoring section of the methodology is written in a clear and precise manner for QA/QC. The Assessment Team confirms the monitoring plan ensures GHG emission reductions and removals are monitored and reported appropriately.

## 4 ASSESSMENT CONCLUSION

Aster Global Environmental Solutions, Inc., has completed the first assessment of VCS Methodology. The assessment team confirms the methodology adheres to the criteria established for this assessment, which is documented and complete. Aster Global concludes without any qualifications or limiting conditions that the methodology documentation meets the requirements of the: VCS Program Guide v4.1, VCS Standard v4.2, and the VCS Methodology Approval Process v4.0. Therefore, Aster Global recommends that Verra approve the methodology (Methodology for Improved Forest Management, v2.0 dated 11 April 2022) as prepared by The Nature Conservancy.

## 5 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

As set out in the VCS Methodology Approval Process for AFOLU:

- 1) “Both validation/verification bodies shall be eligible under the VCS Program to perform validation for sectoral scope 14 (AFOLU); AND
- 2) At least one of the validation/verification bodies shall use an AFOLU expert in the assessment; AND
- 3) At least one of the validation/verification bodies shall have completed at least ten project validations in any sectoral scope. Project validations can be under the VCS Program or an approved GHG program, with the projects having been registered under the applicable program. A validation of a single project under more than one program (e.g., VCS and CDM) counts as one project validation. The validation/verification body that meets this eligibility requirement may be the same validation/verification body that uses an AFOLU expert.”
- 4) 1) The validation/verification body shall be eligible under the VCS Program to perform validation for sectoral scope 142 (AFOLU); AND 2) For non-ARR methodologies, the validation/verification body shall use an AFOLU expert (see Section 10) in the assessment; AND 3) The validation/verification body shall have completed at least ten project validations in any sectoral scope. Project validations can be under the VCS Program or an approved GHG program and projects shall be registered under the applicable program. A validation of a single project under more than one program (e.g., VCS and CDM) counts as one project validation.

Aster Global fulfils the eligibility requirements in the following ways:

- Aster Global is accredited by the American Standards Institute under ISO 14065:2007 for GHG Validation and Verification Bodies, including validation/verification of assertions related to GHG emission reductions and

removals at the project level for Land Use and Forestry (Group 3). VCS accepts this accreditation.

- Aster Global utilized Shawn McMahon (WRC non-peatlands, IFM, ALM, and REDD expert) as VCS-approved experts who participated in the comprehensive review.
- To date, Aster Global has completed greater than 25 VCS project validations under AFOLU.

## 6 SIGNATURE

Signed for and on behalf of:

Name of entity: Aster Global Environmental Solutions, Inc.

Signature: 

Name of signatory: Shawn McMahon

Date: 01 July 2022

# 7 APPENDIX A

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| <b>Item Number</b>   | 1   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>2.3.4</b> 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.   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Sections 3 DEFINITIONS & 7 ADDITIONALITY, FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It is defined that composite control establishes a dynamic performance benchmark for additionality and crediting baselines. There is a notion about additionality that "average stock change in the project scenario exceeds the corresponding average performance benchmark value measured at that monitoring event, calculated emission reductions are deemed additional.", however there is no statement regarding how crediting benchmark is defined.   |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: How is crediting benchmark determined for this methodology? Is performance benchmark metric for additionality and for the crediting baseline same?  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Equation added to end of section 7 to quantify the performance benchmark for additionality. Note that the crediting baseline is calculated for each matched sample unit.  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | <p>Please include a description on baseline benchmark in Step 2: Performance Benchmark. There are two terms embedded within performance benchmark: additionality benchmark (additionality threshold) and baseline benchmark (crediting baseline). In performance methods, baseline benchmark sets the upper limit under which reductions are credited. Simply, emission credits = baseline benchmark - additionality benchmark. However, in Section 7 "where average stock change in the project scenario exceeds the performance benchmark value," it seems like the term "performance benchmark" is used only as an additionality benchmark (strictly speaking, equation 1 is not an additionality benchmark. If the project emission level exceed the additionality benchmark, emissions reductions cannot be credited.) and there is no notion of baseline benchmark. The same level of additionality benchmark and baseline benchmark can be used: "The same (or possibly a different) level of performance can serve as the crediting baseline." (page 4, VCS-Guidance-Standardized-Methods-v3.3_0.pdf). Page 7 of 4_Seager_Introduction_Standardized_Methods.pdf has a good picture of how performance benchmark works. 4_Seager_Introduction_Standardized_Methods.pdf will be provided. This finding may pertain to Row 55 &amp; 56.</p> <p>Please update page numbers of contents in line with correct pages (i.e. 7 ADDITIONALITY, FFCP_Methodology_rev3Mar2021 CLEAN.docx). The font color of "n" is gray (page 8, FFCP_Methodology_rev3Mar2021 CLEAN.docx).</p> |

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| <b>Round NCR/CL/OFI</b>  | <b>2</b> | CL: Please address in line with findings.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |          | We discussed this finding with Verra on a call on May 5 2021, and agreed to request statements from Brent Sohngen and Brian Murray clarifying that their studies (the basis for the market leakage factors) did not distinguish between activity shifting and market effects (and thus that the leakage factors listed in the VCS methodology requirements cover both activity shifting and market effects, and thus that activity shifting need not be excluded). We received statements to this effect from Brian Murray on May 13 2021, and from Brent Sohngen on May 6 2021, both of which were forwarded to Verra and Aster. We await revisions from Verra to its rules and requirements to resolve this finding. |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b> | Pending Verra review.  |
| <b>Round NCR/CL/OFI</b>  | <b>3</b> |  |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |          |  |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b> | Pending Verra review.  |
| <b>Round NCR/CL/OFI</b>  | <b>4</b> |  |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |          | Performance benchmark for additionality is calculated and explained in Section 7 under Step 2. Crediting baseline (performance benchmark) is calculated and explained in Section 8.1 eq 6. Both are yet further explained in the Appendix under "Performance Benchmark." Both reference average stock change outcomes from the composite controls (matches), but the crediting baseline is calculated for each sample unit, and the performance benchmark for additionality is determined with a single calculation for the entire sample population.  |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>5</b> | This addresses all of the issues and the finding should be closed.   |

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| <b>Item Number</b>  | <b>2</b>   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | 1) Methodologies shall provide a description and analysis of the current distribution of performance within the sector as such performance relates to the applicability of the methodology or each performance benchmark (see Section 3.2.5 for further information on applicability of methodologies and performance benchmarks). Methodologies shall also provide an overview of the technologies and/or measures available for improving performance within the sector, though an exhaustive list is not required recognizing that performance methods may be somewhat agnostic with respect to the technologies and/or measures implemented by projects. |
| <b>Requirement Met (Y, N or Pending)</b>                                  | Y  |

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| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | VCS IFM Methodology consultation 6Nov2020.pptx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | The presentation "VCS IFM Methodology consultation 6Nov2020.pptx" on 10 NOV 2020 includes an example of matching process, but the example does not provide a description and analysis of the current distribution of performance within the sector since both FIA plots were used for treatment and composite control. |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Are there any examples that can be provided how this methodology is applied using potential plots which are likely to participate in carbon projects, rather than providing a description and analysis of the current distribution of performance within the sector?   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Withdrawn  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2 The item was discussed during the meeting on DEC 15-16, 2020.<br>This item is closed.  |

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| <b>Item Number</b>   | 3  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>3.1.2</b> Defined terms shall be used within the methodology and methodologies shall not define terms that are already included in the VCS Program Definitions.   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 6 BASELINE SCENARIO, FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It would be more helpful for readers if definitions for some terms could be provided. For example in Section 6 BASELINE SCENARIO, there are several terms used such as "un-treated control plots", "treatment plots", "constituent plots", and etc., or "donor pool" which could cause confusion to readers. |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please provide definitions for some terms, or additional explanations.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Added definitions for "constituent control plots" and "donor pool". Changed terminology throughout from "un-treated control plots" and "treatment plots" to "baseline" and "project" plots. Introduced treatment vs control concept in methodology summary to apply to "project" and "baseline."             |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2 The audit team confirmed the addition and update of definitions in 3 DEFINITIONS, FFCP_Methodology_rev3Mar2021 CLEAN.docx.<br>This item is closed.   |

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| <b>Item Number</b>  | 4  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | <b>3.2.3</b> The applicability conditions shall limit the applicability of the methodology to project activities whose performance can be described in terms of the performance benchmark metric set out in the methodology. |

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| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | <p>Composite control establishes a dynamic performance benchmark for additionality and crediting baselines.</p> <p>Applicability condition 2 specifies that the project area must not be subject to any pre-existing legal encumbrances prohibiting commercial timber harvest. It is unclear how a composite control would be representative if a pre-existing encumbrance limiting, yet not prohibiting harvesting, would be representative and applicable given the provided performance method.</p> |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address verifier findings related to applicability condition 2.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | applicability condition revised to *not* applicable "Where the project activity involves reducing the frequency and/or intensity of timber harvest and the project area is subject to any pre-existing legal encumbrance specifically restricting timber harvest"  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2<br>The change to the language for item 2 addresses the concerns of the audit team. The item has been addressed.  |

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| <b>Item Number</b>   | 5  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <p><b>3.2.6</b> 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.</p> |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | <p>Geographic scope of the applicability of methodology is specified in 4 APPLICABILITY CONDITIONS and APPENDIX A.</p> <p>However, regarding "3) The project activity must not involve a change in hydrology and must not involve soil disturbance exceeding 10% of the project area.", the applicability of methodology should be clear about whether WRC (Wetlands Restoration and Conservation) is included.</p>  |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please specify whether WRC is included.   |



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| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> | text added to applicability condition to exclude WRC   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>             | <p>The audit team confirmed the update in FFCP_Methodology_rev3Mar2021 CLEAN.docx: "The methodology is not applicable to Wetland Restoration and Conservation (WRC) activities."</p> <p>This item is closed.</p> |

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| <b>Item Number</b>   | 6  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>3.3.2</b> In identifying GHG sources, sinks and reservoirs relevant to the project, methodologies shall set out criteria and procedures for identifying and assessing GHG sources, sinks and reservoirs that are controlled by the project proponent, related to the project or affected by the project (i.e., leakage).  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 5 PROJECT BOUNDARY, FFCP_Methodology_6Nov2020.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | <p>GHG sources, sinks and reservoirs were identified following Table 1: Carbon Pools to be considered in Methodologies of Methodology Requirements v4.0.</p> <p>It was noted that language states "conditional on project activity" "Must be included where subject to significant change in the project activity", where for a number of project types this is a required element.</p>  |
| <b>Round 1 NCR/CL/OFI</b>  | 1 NCR: Please correct to ensure that required pools are appropriately required when related IFM activities are taken.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Dead wood changed to a required pool. Text revised to clarify that dead wood is restricted to standing dead (lying dead is not available in sources of control plot data). HWP requirements revised to align with VCS Methodology Requirements Table 1: "Required pool, except where the project activity involves Reduced Impact Logging (RIL) with no or minimal (<25%) effect on total timber extracted, in which case wood products must not be included." |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team reviewed the changes and confirm they are now in line with the methodology requirements document. The item has been addressed.  |

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| <b>Item Number</b>  | 7  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | <b>3.3.6</b> Specific carbon pools and GHG sources, including carbon pools and GHG sources that cause project and leakage emissions, may be deemed de minimis and do not have to be accounted for if together the omitted decrease in carbon stocks (in carbon pools) or increase in GHG emissions (from GHG sources) amounts to less than five percent of the total GHG benefit generated by the project. The methodology shall establish the criteria and procedures by which a pool or GHG source may be determined to be de minimis. For example, peer reviewed literature or the CDM A/R methodological tool Tool for testing significance of GHG emissions in A/R CDM project activities may be used to determine whether decreases in carbon pools and increases in GHG emissions are de minimis. |



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| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 5 PROJECT BOUNDARY, FFCP_Methodology_6Nov2020.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | <p>Burning of tree biomass and fossil fuels were regarded de minimis and conditionally included, or excluded. See Table 5.2: GHG Sources Included In or Excluded From the Project Boundary of FFCP_Methodology_6Nov2020.docx.</p> <p>The verification team noted that for elements where significant change due to the project activity, warranted inclusion within the project no framework was provided by the methodology as to how this was to be determined, in line with the requirements.</p> |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please address verifier findings   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | significance now defined directly referencing T-SIG (both Tables 5.1 and 5.2)  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team reviewed the changes and confirm that the T-SIG tool is applied for both. This is in line with standard practice and appropriate. The item has been addressed.  |

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| <b>Item Number</b>   | 8  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | 1) Belowground biomass pool for IFM LtPF and REDD. The pattern of carbon loss shall be modeled based upon a 10-year linear decay function. |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 5 PROJECT BOUNDARY, FFCP_Methodology_6Nov2020.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Is this criteria considered in the methodology?  |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please address in line with findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Belowground biomass now treated as a unique parameter (LBG) and given a 10 year stock change period.                                       |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | <p>The audit team confirmed the update.</p> <p>This item is closed.</p>  |

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| <b>Item Number</b> | 9 |
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| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | 2) Dead wood pool in IFM and REDD. The pattern of carbon loss shall be modeled using a 10-year linear decay function. |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 5 PROJECT BOUNDARY, FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Is this criteria considered in the methodology?   |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please address in line with findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Deadwood biomass now given a 10 year stock change period.   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team confirmed the update.<br>This item is closed.  |

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| <b>Item Number</b>   | 10   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>3.7.14</b> Leakage in IFM projects can result from activities shifting within the project proponent's operations. Methodologies shall set out criteria and procedures for projects to demonstrate that there is no leakage to areas that are outside the project area but within the project proponent's operations, such as areas where the project proponent has ownership of, management of, or legally sanctioned rights to use forest land within the country. Methodologies shall set out criteria and procedures for projects to demonstrate that the management plans and/or land-use designations of all other lands operated by the project proponent (which shall be identified by location) have not materially changed as a result of the project activity (e.g., harvest rates have not been increased or land has not been cleared that would otherwise have been set aside). Where the project proponent is an entity with a conservation mission, it may be demonstrated that there have been no material changes to other lands managed or owned by the project proponent by providing documented evidence that it is against the policy of the organization to change the land use of other owned and/or managed lands including evidence that such policy has historically been followed. |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 8.3 Leakage, FFCP_Methodology_18Nov2020.docx   |

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| <b>Aster Global Initial Findings (14 December 2020)</b>            | <b>Initial</b> | Activity shifting leakage is defined as addressed by applicability condition 4. The applicability condition only applies to area greater than 20 acres and does not prevent harvesting at levels that are allowable but increased, to make up for lost product in the project area. Similarly, areas less than 20 acres in size could be aggregated to provide a profitable harvest that would have no oversite per the applicability condition. Further, per the requirement verifiers are unable to determine how the methodology addresses "Methodologies shall set out criteria and procedures for projects to demonstrate that the management plans and/or land-use designations of all other lands operated by the project proponent (which shall be identified by location) have not materially changed as a result of the project activity (e.g., harvest rates have not been increased or land has not been cleared that would otherwise have been set aside). " |
| <b>Round NCR/CL/OFI</b>  | <b>1</b>       | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |                | leakage factor clarified to address both activity shifting and market leakage. Application assumes activity shifting leakage is not excluded, and that % leakage within PPs operations is the same as % externally in the market.   |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | <b>2</b>       | The audit team noted no changes in the leakage calculations and are unclear how activity shifting leakage is addressed in the current iteration.  |
| <b>Round NCR/CL/OFI</b>  | <b>2</b>       | CL: Please clarify how the activity shifting leakage is now accomplished in the unchanged equation applied for market leakage. Further, it unclear how any monitoring or related is included.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |                | Responses to inquiries regarding past leakage studies informing the VCS Methodology Requirements market leakage default factors were received from Brent Sohngen and Brian Murray and forwarded to VCS. Sohngen and Murray's responses confirm that the leakage values derived from their studies are estimates of leakage inclusive of activity shifting leakage.  |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b>       | Pending Verra review.   |
| <b>Round NCR/CL/OFI</b>  | <b>3</b>       |   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |                |   |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b>       | Pending Verra review.   |
| <b>Round NCR/CL/OFI</b>  | <b>4</b>       |   |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |                | Current leakage treatment is consistent with new Verra Methodology Requirements 4.1, 3.7.14 option 1, and 3.7.15 option 1, and referenced default leakage factors in Table 2.   |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>5</b>       | The audit team confirmed that the first option of 3.7.14 is selected, further the audit team reached out to Verra and confirmed that table 3 should be applied, as was done by the developer. The audit team further confirmed that option 1 of section 3.7.15 was followed and appropriately implemented within the methodology. The item has been addressed.  |

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| <b>Item Number</b> | 11 |
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| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | 2) Directly accounting for market leakage associated with the project activity. Where directly accounting for leakage, market leakage shall be accounted for at the country-scale applied to the same general forest type as the project (i.e., forests containing the same or substitutable commercial species as the forest in the project area) and shall be based on methods for quantifying leakage from scientific peer-reviewed journal sources. <sup>7</sup> |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N/A  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | 8.3 Leakage, FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It would be helpful for readers if the source for Leakage factor (LFt) in Section 8.3 Leakage is provided in the document, so VCS Methodology Requirements v4.0.   |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please include the source for Leakage factor (LFt) in Section 8.3 Leakage.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | No need for additional citation (from Methodology Requirements doc). Withdrawn.  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The leakage factor comes from Table 2: Market Leakage Discount Factors, VCS Standard v4.0.<br><br>This item is closed.   |

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| <b>Item Number</b>   | 12  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | 2) Monitoring procedures, including estimation, modeling, measurement or calculation approaches.  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | The monitoring procedures are insufficient to determine LTwp,i,t or LTbsl,i,j,t for example, noting no parameters exist for the measurement of diameter or similar as required inputs for volume/biomass equations.   |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Expanded text in parameter tables for live above- and belowground biomass and dead wood: Tree attributes (e.g. diameter at breast height, total height) incorporated as independent variables in allometric equations must be directly-measured in the field applying established best practices, such as those found in:<br>Kershaw Jr, J.A., Ducey, M.J., Beers, T.W. and Husch, B., 2016. Forest mensuration. John Wiley & Sons.<br>Avery, T.E. and Burkhart, H.E., 2015. Forest measurements. Waveland Press.<br>FIA National Field Guide for Phase 2 Plots<br>Measurement protocols will be detailed in standard operating procedures. |

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| <b>Aster Global Findings - Round (16 April 2021)</b>               | <b>2</b> | The audit team confirmed the additional language. The additional language does not address the need for the creation of additional parameters for these values. Given that, the previous finding still exists.  |
| <b>Round NCR/CL/OFI</b>  | <b>2</b> | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |          | Following text added to parameter tables for LAG, LBG, DW and Bbremoved: "parameter tables for all tree attributes (e.g. diameter at breast height, total height) incorporated as independent variables in allometric equations must be included in the project description under Data and Parameters Monitored." Also, Section 9.3 Monitoring Plan following text added under information to be included: "3. Parameters to be measured, including parameter tables for all direct-measured tree attributes (e.g. diameter at breast height, total height) incorporated as independent variables in allometric equations." |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b> | The audit team reviewed the updated language and confirms it will result in appropriate monitoring parameters. The item has been addressed.   |

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| <b>Item Number</b>   | 13  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Application of the methodology  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | What if all the FIA plots matched do not include any harvested plots, so resulting in a situation that baseline tree growth is larger than the project tree growth?     |
| <b>Round NCR/CL/OFI</b>  | <b>1</b><br>CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | withdrawn   |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | <b>2</b><br>The item was discussed during the meeting on DEC 15-16, 2020, and the audit team confirmed that Round 1 finding rarely happens.<br><br>This item is closed. |

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| <b>Item Number</b>  | 14                             |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | Application of the methodology |
| <b>Requirement Met (Y, N or Pending)</b>                                  | Y                              |

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| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | A number of provided approaches pertain to the US. It is unclear how the methodology addresses the global context throughout.                                 |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address how the methodology is applicable for the development outside of the US, understanding that Appendix A is only for the United States. |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | text added to explain that methodology can be expanded to new geographies via revisions   |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | 2<br>The audit team confirmed additional language has been added to Section 4 and Section 6. The item has been addressed.                                     |

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| <b>Item Number</b>   | 15  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A.   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Based on the initial presentation to the verification team a list of covariates were tested for appropriateness. It is unclear how the covariates selected are appropriate for the entire United States, as to our understanding only a test in the Appalachians has been examined.   |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address verifier findings and clarify how the covariates determined are appropriate for the entire United States.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Required covariates identified in Appendix A need not be comprehensive. We expect that there are other unidentified and influential covariates, but would not introduce bias unless they are unequally distributed among the project and baseline plots. We expect many of these to introduce random noise around estimation of impacts, driving baseline closer to the average. We have added provisions in Appendix A to include additional covariates provided there is a demonstrated empirical basis for including them. |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | 2<br>The audit team agrees that the covariates not necessarily be comprehensive, but are unclear how they were covariates determined for the entire United States region, when they were only tested against Appalachia. Further, while language has been included to allow for the effective inclusion of other covariates, there is no requirement for such covariates which may be of great importance for a particular region.  |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier findings and clarify how the covariates determined are appropriate for the entire United States, addressing the verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | see narrative response in "narrative responses IFM methodology.doc"   |

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| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b> | The audit team reviewed the narrative provided. While the results of the approach applied are clear, it is unclear how the approach applied is in line with the approach applied to determine the covariates originally. |
| <b>Round NCR/CL/OFI</b>  | <b>3</b> | CL: Please clarify how the approach applied is in parallel to the approach originally applied for the determination of appropriate covariates.   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |          | Awaiting further guidance from Aster per 23 Sep 2021 call  |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b> | The audit team spoke with the developer on a call and confirmed that the approach previously presented was appropriate and justified the covariates applied. The item has been addressed.                                |

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| <b>Item Number</b>   | 16   |  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Application of the methodology   |  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | The methodology as presented includes limited detail on details required for the generation for an Appendix for another performance benchmark in another country outside of the United States. |  |
| <b>Round NCR/CL/OFI</b>  | <b>1</b>   | CL: Please clarify how the information in the methodology presents sufficient detail for the generation of a performance benchmark outside of the United States. In doing so, please clarify how the detail will ensure similar results of equally representative estimation of crediting. |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | see response to finding 16. new procedures to derive a performance benchmark outside of the US would have to be validated as a methodology revision.   |  |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | <b>2</b>   | The audit team understands that updates will happen via revision. It is assumed the revision process will adequately address validator concerns. The item has been addressed.  |

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| <b>Item Number</b>   | 17          |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A. |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y           |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology |



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| <b>Aster Global Initial Findings (14 December 2020)</b>            |   | The appendix specifies the use of covariates for determination of mahalanobis distance. Nowhere in the methodology is there specification of how these are to be determined on the project case.  |
| <b>Round NCR/CL/OFI</b>  | 1 | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |   | Covariates are not specified in the methodology, and are not parameters that are included in any methodology equation. They are solely used in obtaining matches, and specified in the applicable performance method appendix. Table A1.1 in Appendix A has been expanded to include details on source of covariate value for project sample units. |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | 2 | Additional detail has been provided to ensure more common application of the covariates. It is the audit team understanding that the covariates are used in the determination of equation A1 and as such should be included in parameters at validation for the Appendix.   |
| <b>Round NCR/CL/OFI</b>  | 2 | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |   | Tables for parameters available at validation (specified matching covariates from Table A1.1) added to Appendix A.  |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | 3 | The audit team confirmed the inclusion of related parameters within Appendix A. The item has been addressed.  |

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| <b>Item Number</b>   | 18          |   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A. |   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y           |   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology |   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |             | The mahalanobis assessment specifies with replacement. Can you clarify why replacement is included?   |
| <b>Round NCR/CL/OFI</b>  | 1           | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |             | allowing replacement reduces bias (doesn't force the matching procedure to ignore a good fit if it has been used before)  |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | 2           | It is unclear how this is the case. A review of literature reveal the most ideal case uses no replacement, and that replacement complicates the uncertainty. Please provide additional detail or more specific references to clarify the previous response. |
| <b>Round NCR/CL/OFI</b>  | 2           | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |             | see narrative response in "narrative responses IFM methodology.doc"   |



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| <b>Aster Global Findings - Round 3 (01 September 2021)</b> | The audit team was provided with a narrative stating references to literature that support the use of replacement for the reduction of bias. The audit team reviewed those materials and confirm the approach applied is appropriate. The item has been addressed. |
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| <b>Item Number</b>   | 19   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A.  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It is noted that for a given point a mahalanobis distance is used to determine the 10 nearest neighbors. Given the relative scale of a number of projects and the frequency of FIA plots, will it not be likely for a number of sample units to share the same constituent control? If that is the case what are the implications and how is appropriate. Please cite independent analysis to demonstrate that this has not occurred or had little to no impact on case studies to date. |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | 10:1 matching reduces influence of any individual FIA plots on control. Shared controls are addressed in calculation of uncertainty (they lower effective sample size and increase variance).  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2<br>It is unclear how this is incorporated into the uncertainty computation. Please provide additional detail clarifying exactly how this is specifically addressed within the uncertainty computation as presented within equation 13.   |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | see narrative response in "narrative responses IFM methodology.doc"  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | 3<br>The audit team reviewed the provided narrative. It was noted that the changes related to the text of the equation. The provided response gives additional detail. The item has been addressed.  |

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| <b>Item Number</b>   | 20          |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Table 8.1   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y           |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology |

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| <b>Aster Global Initial Findings (14 December 2020)</b>            |          | Table 8.1 is included as being illustrative in how to apply equation 4. It is unclear how the table satisfies this goal in illustrating application of equation 4.  |
| <b>Round NCR/CL/OFI</b>  | <b>1</b> | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |          | Table 8.1 substantially revised, broken down into 3 sub tables to show step by step process from periodic measurements to derivation and application of annual stock change values.                             |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | <b>2</b> | The audit team reviewed the revisions. The tables are helpful, however at least one error was noted in the table. Please ensure any errors are addressed, to enable the reader to fully understand the process. |
| <b>Round NCR/CL/OFI</b>  | <b>2</b> | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |          | Corrections made to Table 8.1 - see revised "accounting demo rev May2021.xlsx" and "FFCP_Methodology_revMay2021.doc"  |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b> | The audit team reviewed the changes, this item is pending clarification or changes to related equations and will be reassessed following any updates.   |
| <b>Round NCR/CL/OFI</b>  | <b>3</b> |   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |          |   |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b> | The audit team confirmed changes to equations have been appropriately applied. The item has been addressed.   |

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| <b>Item Number</b>   | 21          |  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Section 8.2 |  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y           |  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology |  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |             | Project emissions specify monitoring frequency after the first measurement period as being equal. What happens if this cannot be performed for a given plot? |
| <b>Round NCR/CL/OFI</b>  | <b>1</b>    | CL: Please address verifier findings.  |

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| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> | text now reads "As with constituent baseline plots , project sample units may be remeasured on a staggered basis (i.e. remeasurements of cohorts of sample units are scheduled in different years within a monitoring cycle) provided that subsets of sample units in the project scenario remeasured in different years are selected systematically or at random from the total sample population." Note that a requirement that project monitoring frequency not exceed that of the control is unnecessary - parameter table requires measurement of project every 5 yrs or less, and baseline plots must be remeasured at least every 10 yrs. |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>             | The audit team confirmed the additional language and agree that the described approach is sound. The item has been addressed.  |

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| <b>Item Number</b>   | 22  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A.   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | <p>The appendix specifies criteria for excluding control points, such as being within the project area. It is noted that a 1.6 kilometer buffer is applied to project area to exclude points that might be within the project area due to fuzzy FIA plot locations. It is unclear why a similar buffer is not applied to GHG mitigation project areas as defined in item 3.</p> <p>It was noted that no exclusions were made for plots where diameters or heights were estimated. It is unclear why estimated plots would be acceptable.</p>  |
| <b>Round NCR/CL/OFI 1</b>  | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | text added "to assess the location of any FIA plot, the nearest project area boundary will be buffered externally by 1.6 kilometers". Review of FIA data confirm that estimation of tree measurements (not direct measure) is not prevalent, and is restricted to circumstances relating to safety of field crew, merged stems, inaccessible "woodland stem" trees, etc. Within the FIA data a small number of estimations are made (1.38% of heights, 1.44% of diameters), by highly trained personnel, with systematic safeguards in place to constrain inaccurate estimates. Within our methodology, those measurements are then combined with numerous highly accurate measurements at the plot level to estimate stand stocking. We do not feel that the use of estimated measurements constitutes a major weak point in this analysis or that it substantively changes our estimates of biomass or carbon stocking. |

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| <b>Aster Global Findings - Round 2 (16 April 2021)</b> | <p>The audit team reviewed the changes for the buffer distance and confirm they are in line with good practice.</p> <p>The audit team reviewed the response related to estimated measures. The audit team agrees that given the frequency of occurrence, the estimated measures have a small to negligible effect on crediting.</p> <p>The item has been addressed.</p> |
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| <b>Item Number</b>   | 23  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Section 8.4   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | A note at the bottom of page 20 states that "...only sample units I for which both project and baseline scenarios have been remeasured within the interval t-x are included." Please clarify why this language exists and when it would be applicable, given that all project plots are at the same remeasurement frequency after the first remeasurement.  |
| <b>Round 1 NCR/CL/OFI</b>  | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | text added to accommodate staggered remeasurement timetables in the project scenario. Clarified in Dec 16 meeting. When calculating emission reductions, it is necessary with matching to have a full matched set of control and treatment values, thus this requirement that baseline plots paired to a project plot with as yet no stock change value are not included in calculation of emission reductions. |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team confirms that the language was addressed to allow staggered audits. The item has been addressed.   |

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| <b>Item Number</b>   | 24   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Uncertainty  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It is unclear how the uncertainty equation presented within section 8.5 accounts for FIA plot uncertainty. |

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| <b>Round NCR/CL/OFI</b>  | <b>1</b> | CL: Please address verifier findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |          | Variance in stock change among FIA plots included in the control/baseline is included in the uncertainty calculation |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | <b>2</b> | The audit team agrees with this interpretation. The item has been addressed.   |

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| <b>Item Number</b>   |          | 25  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  |          | Section 8.1   |
| <b>Requirement Met (Y, N or Pending)</b>                                   |          | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> |          | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |          | N/A previously did not exist  |
| <b>Round NCR/CL/OFI</b>  | <b>1</b> |   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |          |   |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | <b>2</b> | Page 14 includes language, "Live belowground biomass and dead wood stock change in the baseline scenario, $\Delta LBG_{(bsl,i,j,mt)}$ and $\Delta DW_{(bsl,i,j,mt)}$ , are calculated in the same way, but replacing $X_{bsl,i,j,t}$ with 10." It is the audit team understanding that each of those equations needs to be explicitly defined in an equation within the methodology. Additionally, it is unclear why a value of 10 would be applied across the board for $X_{bsl,i,j,t}$ . Please clarify.  |
| <b>Round NCR/CL/OFI</b>  | <b>2</b> | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |          | Equations 2 and 3 now broken down into sub equations a, b and c pertaining to live aboveground, live belowground and dead wood stocks, respectively. For LBG and DW, the value 10 corresponds to the 10 year decay rate required for these pools in the VCS Methodology Requirements.   |
| <b>Aster Global Findings - Round (01 September 2021)</b>                   | <b>3</b> | The audit team reviewed and confirmed the inclusion of these elements. It was noted for belowground and deadwood that a denominator of 10 is applied to account for a decay rate, however this does not result in an annualization of the stock change. It is unclear where the component element that annualizes for measurement frequency is included. Further, it is unclear how the rate of 10 is being applied given that the methodology functions on stock changes and it would be assumed new growth and related changes to dead and belowground pools are occurring. |
| <b>Round NCR/CL/OFI</b>  | <b>3</b> | CL: Please address verifier findings.   |

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| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b>         | see "narrative responses IFM methodology Sep2021"  |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>                  | The audit team reviewed the changes and confirm that the approach apply appears to be within the methodology requirements. The item has been addressed.  |
| <b>Item Number</b>   | 26   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Section 8.1  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | N/A previously did not exist   |
| <b>Round 1 NCR/CL/OFI</b>  | 1  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | Page 14 includes language, "Live belowground biomass and dead wood stock change in the baseline scenario, $\Delta LBG_{(bsl,i,j,mt)}$ and $\Delta DW_{(bsl,i,j,mt)}$ , are calculated in the same way, but replacing $X_{bsl,i,j,t}$ with 10." It is the audit team understanding that each of those equations needs to be explicitly defined in an equation within the methodology. Additionally, it is unclear why a value of 10 would be applied across the board for $X_{bsl,i,j,t}$ . Please clarify. |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Equations 2 and 3 now broken down into sub equations a, b and c pertaining to live aboveground, live belowground and dead wood stocks, respectively. For LBG and DW, the value 10 corresponds to the 10 year decay rate required for these pools in the VCS Methodology Requirements.  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | The audit team reviewed and confirmed the inclusion of these elements. It was noted for belowground and deadwood that a 10 is applied to account for a decay rate, however as described in the finding above, this does not result in an annualization of the stock change. It is unclear how the summation basis are determined. Further, it is unclear how the equations presented are mathematically appropriate as the "IF" statement in the middle of the equation has no then or recourse.           |
| <b>Round 3 NCR/CL/OFI</b>  | 3<br>CL: Please address verifier findings. Additionally, please clarify equations to present mathematically correct and logically usable equations.  |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b>         | see "narrative responses IFM methodology Sep2021"  |

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| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b> | The audit team reviewed the changes and confirm that the approach apply appears to be within the methodology requirements related to the decay rate. The audit team found no response nor change to address the second part of the verifier findings about the mathematical appropriateness of the equations as written. |
| <b>Round NCR/CL/OFI</b>  | <b>4</b> | CL: Please address how the equations as written are mathematically correct and logically usable as presented with the "IF" statement in the middle of the equation.  |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |          | Please find attached the methodology with revisions to equations 2 and 3 (addressing finding #28) and to equation 7 (addressing finding #34). With your consent we are submitting this email as our formal response to the round 4 findings (and acknowledge outstanding findings dependent on Verra response).          |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>5</b> | The audit team spoke with the methodology developer on the phone and understood the approach to be applied changes were made for clarity. The item has been addressed.   |

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| <b>Item Number</b>   | 27   |   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Section 8.1  |   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | N/A previously did not exist   |   |
| <b>Round NCR/CL/OFI</b>  | <b>1</b>   |   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |  |   |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | <b>2</b>   | Harvested wood products computation is provided in equation 4. It is unclear whether non-commercial species are included in this computation, as no mention is made to them in the text or related parameters. Related, it is unclear why non-commercial species would have long-term storage factors in either the baseline or project case. |
| <b>Round NCR/CL/OFI</b>  | <b>2</b>   | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Parameter definitions referenced in eq. 4, and parameter tables for BBremoved parameters now specify restricted to commercial species. |   |
| <b>Aster Global Findings - Round (01 September 2021)</b>                   | <b>3</b>   | The audit team reviewed the changes and confirm that only commercial species are now eligible for the accounting of harvested wood products. The item has been addressed.   |

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| <b>Item Number</b> | 28 |
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| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Section 8.4   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | N/A previously not an issue.  |
| <b>Round 1 NCR/CL/OFI</b>  | 1   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |   |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | 2<br>The text states, "Equations 9 and 10 assume either..." It is unclear how this is appropriate as equation 9 has no relationship to the statement made. Please update the reference to ensure clarity. |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier findings.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Equations references in the flagged text corrected (and equation numbers updated generally)   |
| <b>Aster Global Findings - Round (01 September 2021)</b>                   | 3<br>The audit team confirmed that the equation references were corrected. The item has been addressed.   |

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| <b>Item Number</b>   | 29          |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A. |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y           |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |             |
| <b>Round 1 NCR/CL/OFI</b>  | 1           |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |             |



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| <b>Aster Global Findings - Round 2 (16 April 2021)</b>             | 2 | The text includes a list of adjustments to be made to ensure a larger donor pool. Among them are items "3. Remove the restriction on land ownership class (public, private), incorporating all FIA plots regardless of ownership." It is unclear how this is appropriate. Assuming the project were on private lands an argument could be made that public FIA plots are likely conservative. However, if the project were to occur on public lands it is unclear how private baseline plots would be allowable. Please address. |
| <b>Round NCR/CL/OFI</b>  | 2 | CL: Please address verifier findings.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |   | We have eliminated the provision to allow removing land ownership class from exact matching.   |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         | 3 | The audit team confirmed that the provision was removed. The item has been addressed.  |

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| <b>Item Number</b>   | 30          |   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Appendix A. |   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y           |   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology |   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |             |   |
| <b>Round NCR/CL/OFI</b>  | 1           |   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |             |   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2           | The text includes a list of adjustments to be made to ensure a larger donor pool. Among them are items "5. Remove the restriction on forest type, incorporating FIA plots from all forest types." It is unclear how this is appropriate as you could be comparing distinctly different forest types which would effectively have other management objectives in the baseline case that would never be appropriate for the project land. Please address. |
| <b>Round NCR/CL/OFI</b>  | 2           | CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |             | Provision has been further restricted to "Adjust the restriction on forest type, incorporating FIA plots from all other forest type groups within softwood (< 400) or hardwood (>=400) category corresponding to the project sample unit"   |

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| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         | 3 | The audit team confirmed the changes made. While it was noted that hardwood forest types could no longer get softwood forest type matches, it still remains unclear how the removal of restriction would address the previous audit team findings, for example it would still be possible for a beech/maple forests in the Lake States matching up to aspen plantation where the management would never be similarly appropriate.  |
| <b>Round NCR/CL/OFI</b>  | 3 | CL: Please address verifier findings.  |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |   | Provision removed. We concede this point to Aster, the example scenarios they provide have convinced us that it is not wise to have any matching occur across lines of forest type. Though plantations will never be matched to natural forest due to the stand origin exact match criteria, we were especially convinced by Aster's aspen vs northern hardwoods example: comparison of biomass across these two forest types would be ill advised, but possible in the previous form of the methodology. We have revised to remove this "safety valve" from the methodology. In practice, none of our extensive trial runs have required use of this stipulation, and we cannot envision a context where the methodology should be applied where it would be necessary. |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>          | 4 | The audit team reviewed the changes and confirmed the removal of the language in question. The item has been addressed.  |

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| <b>Item Number</b>   | 31 |  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  |    | Methodology/Appendix A.  |
| <b>Requirement Met (Y, N or Pending)</b>                                   |    | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> |    | Methodology/Appendix A.  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |    |  |
| <b>Round NCR/CL/OFI</b>  | 1  |  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |    |  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2  | An example was shown to the audit team in a power point presentation detailing how a single point would be allocated its 10:1 matches. No other more detailed examples have been provided to show how this would play over a larger sampling area, where repeated surrogates are likely and how uncertainty computations would account for this "real world" case. |
| <b>Round NCR/CL/OFI</b>  | 2  | CL: Please provide additional workups/examples to show how this process occurs over a larger area (greater than 1 field point), similarly, demonstrating that uncertainty appropriately accounts for this application.   |

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| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> | see narrative response in "narrative responses IFM methodology.doc"  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         | The audit team reviewed the provided narrative. The narrative includes detail to an analysis performed to demonstrate 10:1 matching on a large scale. The audit team was unable to find the detail to support the narrative. |
| <b>Round NCR/CL/OFI</b>  | 3<br>CL: Please provide additional detail analysis materials to support the provided narrative response.   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> | see "narrative responses IFM methodology Sep2021"  |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>          | The audit team reviewed the provided response and related results and R code. The example satisfies the audit teams questions. The item has been addressed.  |

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| <b>Item Number</b>   | 32   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Section 8.2  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Section 8.2  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |  |
| <b>Round NCR/CL/OFI</b>  | 1  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     |  |
| <b>Round NCR/CL/OFI</b>  | 2  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | The audit team noted that the project case belowground and deadwood stock change equations are not presented as individual equations, similar to EQ. 7. A similar request was previously made for related baseline elements to break these out to individual equations. Given that this was not explicitly called out it will be treated under the original task for review. |
| <b>Round NCR/CL/OFI</b>  | 3<br>CL: Please ensure unique equations are provided for project belowground and deadwood, similar to baseline separations previously performed.   |

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| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> | Following precedent in VM0042 (see Section 8.3), we prefer to retain the reference to the (identical) baseline equations to avoid having the methodology become needlessly bulky.  |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>          | The audit team reviewed and noted the language reads, "Live belowground biomass and dead wood stock change in the project scenario, $\Delta LBG(wp,i,t)$ and $\Delta DW(wp,i,t)$ , are calculated using the same equation for live aboveground biomass (equation 7). " Equation 7 references a project equation rather than baseline equations as indicated in the methodology developer response. |
| <b>Round 4 NCR/CL/OFI</b>  | CL: Please clarify how the language presented within the methodology, as highlighted in the findings is in line with the previous response.  |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> | Please find attached the methodology with revisions to equations 2 and 3 (addressing finding #28) and to equation 7 (addressing finding #34). With your consent we are submitting this email as our formal response to the round 4 findings (and acknowledge outstanding findings dependent on Verra response).  |
| <b>Aster Global Findings - Round 5 (03 November 2021)</b>          | The audit team spoke with the methodology developer on the phone and reviewed the applied changes. The item was appropriately updated. The item has been addressed.  |

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| <b>Item Number</b>   | 33  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | New Eq. 2   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_rev3Mar2021 CLEAN.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | N/A previously did not exist  |
| <b>Round 1 NCR/CL/OFI</b>  |   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team reviewed the equation and noted that the term $LAG_{bsl,i,j,t}$ is used. It is unclear what $t_{bsl,i,i,t}$ is. Please address.<br><br>Further, the reference in the where statement has a different subscript than the parameter in the equation. Please address. |
| <b>Round 2 NCR/CL/OFI</b>  | CL: Please address verifier findings.   |

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| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> | Term term LAG <sub>bsl,i,j,t</sub> -bsl <sub>i,i,t</sub> has been corrected to term LAG <sub>bsl,i,j,t</sub> -Xbsl <sub>i,j,t</sub> . Here and elsewhere: there are a few relic "xmt"s still in there, that have been changed to:<br><br>Xbsl <sub>i,j,t</sub> Length of measurement interval ending at time t for constituent baseline plot ij; years |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         | The audit team confirmed the correction of the equation. The item has been addressed.  |

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| <b>Item Number</b>   | 34   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Eq. 5 (previously Eq.3)  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_rev3Mar2021 CLEAN.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | "Where burning occurs in the monitoring interval ending at time t, CH <sub>4</sub> and N <sub>2</sub> O emissions from fire are included and calculated using Equation 4," should be Equation 3 (page 13, FFCP_Methodology_18Nov2020 CLEAN.docx) |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address in line with findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | text reference corrected   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team confirmed the update to the updated equation 5. The audit team noted parameters in the equation do not match those presented in the where statement below. Please correct to ensure accuracy.                                     |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Eq 5 parameter descriptions corrected to match equation  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | The audit team confirmed the update of Eq.5.<br>This item is closed.   |

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| <b>Item Number</b>  | 35   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | Eq.4 |

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| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_18Nov2020 CLEAN.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Is "per year" omitted from "t CO <sub>2</sub> -e per unit area" of $\Delta FB_{bsl,i,t}$ ?<br>Please include a statement where the formula for weight can be found for readers, like "an example weight equation can be found in APPENDIX A".   |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address in line with findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | time-related subscript clarified/corrected, and "per year" added where appropriate, to all stock change/emission terms. Added text on derivation of weights included in weight parameter table.   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2<br>The audit team confirmed the update of "per year", and the description on the derivation of weights was confirmed in 9.1 Data and Parameters Available at Validation, FFCP_Methodology_rev3Mar2021 CLEAN.docx.<br><br>This item is closed. |

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| <b>Item Number</b>   | 36  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Eq.5  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_18Nov2020 CLEAN.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | In applying $N_{fert,bsl,i,t}$ , how is the area of baseline determined? If applying FIA data as composite control, does each Ecological Section define area of baseline?       |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address in line with findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | value based on sampling, no area determined. A project sample unit w N emissions contributed to the sample population mean emissions (which are multiplied by the project area) |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2<br>The audit team agrees and confirms the response from the Methodology Developer that $N_{fert,bsl,i,t}$ is based on sampling.<br><br>This item is closed.                   |

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| <b>Item Number</b>  | 37    |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | Eq.10 |

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| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_18Nov2020 CLEAN.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | <p>In the equation, <math>1/ERT</math> should be <math>1/(Ert\_bar)</math>.</p> <p>Should uncertainty calculation only be considered for inventoried data like ARB protocol?</p> <p>It would be appreciated if the source for 15% could be reminded again. By the way, is it 15% or 1.5%?</p> <p>Is "<math>1/n^2 * \sum_{(i=1)}^n n_{(bsl,i,t)}^2</math>" exact representation of <math>VAR(\Delta CO2_{bsl,i,t})</math>? Why not simply assume <math>\Delta CO2_{bsl,i,t}</math> as a new variable, (or a value)?</p>  |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please address in line with findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | <p>Ert changed to Ert bar. VCS Meth Requirements 2.4.1 establish allowable +/- 15% of mean at 95% confidence. Uncertainty in the baseline is quantifiable and included in the overall uncertainty calculation. We have revised eq. 10, reframing the baseline variance across the set of control units (= "constituent" sample plots, so no longer looking at variance within composite controls), which also eliminates from relevance any covariance (either between treatments and their matched composite controls, or between composite controls due to replacement and shared control units).</p> <p>Equation 10 now matches the structure of the 3rd variance estimator in Becker and Ichino (Becker, S.O. and Ichino, A., 2002. Estimation of average treatment effects based on propensity scores. The stata journal, 2(4), pp.358-377.). Note that weights of zero for unmatched controls are implied. Implications of sampling with replacement are that control plots matched more than once have higher (summed) weight and add to overall variance.</p> <p>Also, the covariance term (between wp and bsl) has been dropped, because we agree that there should be no covariance between constituent control plots and treatment plots. Also, potential covariance among composite controls due to replacement (as raised in the finding) is irrelevant (and we believe a rarely significant outcome anyway – your example is an extreme one).</p> |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | Eq.13 is updated as discussed during the meeting on DEC 15-16, 2020, however please delete unnecessary terms like covariance of $\Delta CO2_{wp,i,t}$ and $\Delta CO2_{bsl,i,t}$ . Additionally, please re-check the editing throughout the document like font size, font color, tables, and etc.   |
| <b>Round 2 NCR/CL/OFI</b>  | 2 CL: Please address in line with findings.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Eq. 13 parameters listed now match equation and general proofing and editing performed.   |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | <p>The audit team confirmed the update of Eq.13.</p> <p>This item is closed.</p>  |

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| <b>Item Number</b>   | 38  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | New Eq. 10  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_rev3Mar2021 CLEAN.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |   |
| <b>Round 1 NCR/CL/OFI</b>  | 1   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |   |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | 2 The audit team noted that the term At is undefined in the equation where statement. Please address. |
| <b>Round 2 NCR/CL/OFI</b>  | 2 CL: Please clarify the term in the where statement.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Parameter At now defined under eq 10  |
| <b>Aster Global Findings - Round (01 September 2021)</b>                   | 3 The audit team confirmed the declaration of At in the where statement. The item has been addressed. |

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| <b>Item Number</b>   | 39   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | RD (Relative) Density  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Please specify how denominator "10 (so, dbh/10)" is derived for <i>RDperacre</i> in Table A1.1 of FFCP_Methodology_18Nov2020 CLEAN.docx. It looks like it is 25 instead of 10. Which reference this equation comes from? This is just to look at if the exact equation was referenced. |
| <b>Round 1 NCR/CL/OFI</b>  | 1 CL: Please address in line with findings.  |



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| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> | equation is correct - equation from Ducey and Knapp amended to use English units   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>             | The item was discussed during the meeting on DEC 15-16, 2020, and the audit team confirmed that the equation was correct. There was a confusion in the units used.<br><br>This item is closed. |

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| <b>Item Number</b>   | 40   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | Eq A2  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Appendix A   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |  |
| <b>Round 1 NCR/CL/OFI</b>  | 1  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | Equation A2 uses the term $\bar{x}$ bsl,x in the upper part however uses the term $\bar{x}$ bsl,i in the lower part. It is unclear if these are supposed to be the same. Likewise it is unclear why $\bar{x}$ bsl,i would be mathematically appropriate, given that the equation sums for all i. Please address. |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please ensure consistent usage of terms for clarity.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Equation (former A2, now A3) corrected, changing term from $\bar{x}$ bsl,i to $\bar{x}$ bsl,x  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | The audit team confirmed the use of the term $\bar{x}$ bsl,x for all instances is appropriate and has been modified accordingly. The item has been addressed.  |

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| <b>Item Number</b>  | 41      |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | $GWP_g$ |
| <b>Requirement Met (Y, N or Pending)</b>                                  | Y       |

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| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Please update with the correct "Equations" numbers.                         |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please update with the correct "Equations" numbers.                |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | equation numbers and references in narrative and parameter tables corrected |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team confirmed the update.<br>This item is closed.                |

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| <b>Item Number</b>   | 142   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | C <sub>f</sub>  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Would "TABLE 3A.1.12" from IPCC "Good Practice Guidance for Land Use, Land-Use Change and Forestry" be more appropriate for this parameter, depending on EQUATION 3.2.20 (page 3.49)? |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address in line with findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | amended to reference Table 3A.1.12 from IPCC 2003 "Good Practice Guidance for Land Use, Land-Use Change and Forestry"2019   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team confirmed the update.<br>This item is closed.  |

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| <b>Item Number</b>   | 43                             |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | EF <sub>g</sub>                |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y                              |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx |

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| <b>Aster Global Initial Findings (14 December 2020)</b>            |   | Please update with the correct "Equations" numbers.<br>Would "TABLE 3A.1.16" from IPCC "Good Practice Guidance for Land Use, Land-Use Change and Forestry" be more appropriate for this parameter? |
| <b>Round 1 NCR/CL/OFI</b>  | 1 | CL: Please update with the correct "Equations" numbers. Please address in line with findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |   | amended to reference Table 3A.1.16 from IPCC 2003 "Good Practice Guidance for Land Use, Land-Use Change and Forestry"  |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | 2 | The audit team confirmed the update.<br>This item is closed.   |

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| <b>Item Number</b>   | 44                             |   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | EF <sup>Ndirect</sup>          |   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y                              |   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx |   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |                                | Please update with the correct "Equations" numbers.                         |
| <b>Round 1 NCR/CL/OFI</b>  | 1                              | CL: Please update with the correct "Equations" numbers.                     |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |                                | equation numbers and references in narrative and parameter tables corrected |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | 2                              | The audit team confirmed the update.<br>This item is closed.                |

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| <b>Item Number</b>   | 45   |  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | BBremovedsaw,bsl,i,j,t and BBremovedsaw,wp,i,t |  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N  |  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx                 |  |

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| <b>Aster Global Initial Findings (14 December 2020)</b>            |          | It was noted that this parameter is sorted based on dbh. A review of Hoover indicates that products are to be broken into pulpwood and sawtimber. It is unclear how the a dbh break would be appropriate as a tree of sawtimber size is comprised of both sawlogs and pulpwood logs.  |
| <b>Round NCR/CL/OFI</b>  | <b>1</b> | CL: Please address verifier findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |          | We tested the potential bias of the DBH-based saw/pulp breakdown, vs the volumetric breakdown (as reported by FVS). See "UTK FVS data demo pulp_saw breakdown.xlsx" Note that the DBH-based breakdown consistently estimate a higher percentage in saw volume vs the volumetric breakdown (not surprising, because the DBH-based breakdown ignores smaller upper stem diameters that would be classified as pulp). This treatment is conservative, because a higher saw fraction means higher storage and less emissions. It can be expected that project activities will have higher harvest intensity in the baseline, and consequently lower net harvest emissions in the baseline using the DBH-based breakdown as the basis for calculating longterm storage in harvested wood products. |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | <b>2</b> | The audit team reviewed the response and the workup. While the assumption made is conservative where the project and baseline both focus their activities on a sawtimber market, this would not necessarily hold if a project were to extend rotations (for sawtimber), while baseline plots were doing shorter pulp rotations (e.g. U.S. south pellet mill areas). The appendix has no covariate to ensure similar milling is done, so it would be unable to accurately address this item.   |
| <b>Round NCR/CL/OFI</b>  | <b>2</b> | CL: Please address verifier findings and clarify how the DBH approach would be conservative in the case described by the audit team.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |          | see narrative response in "narrative responses IFM methodology.doc"   |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b> | The audit team reviewed the response and the narrative and related support. It is unclear how the two worst case scenarios are truly worst case scenarios, as for the pine workup it is effectively a small pine sawtimber rotation being compared to a longer pine sawtimber rotation, rather than a pine pulpwood rotation being compared to a long pine sawtimber rotation. For the hardwood stand the comparison is likely more accurate however, a longer case is even more likely appropriate. Note this item will also be brought to verra to ensure that a de minimis demonstration is allowable for this element.  |
| <b>Round NCR/CL/OFI</b>  | <b>3</b> | CL: Please clarify how the workups used are extreme in response to audit team findings. Please provide evidence that with a more extreme example the results are still de minimis.  |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |          | see "narrative responses IFM methodology Sep2021"   |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b> | This item is pending Verra Response about the appropriateness of a de minimis demonstration.  |
| <b>Round NCR/CL/OFI</b>  | <b>4</b> |   |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |          |   |

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| <b>Aster Global Findings - Round 5 (03 November 2021)</b> | Verra confirmed on a call that the approach for de minimis demonstration was appropriate for this item. The audit team reviewed the provided more extreme examples and confirm that the items are de minimis. |
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| <b>Item Number</b>   | <b>46</b>   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | BBremovedpulp,bsl,i,j,t and BBremovedpulp,wp,i,t  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It was noted that this parameter is sorted based on dbh. A review of Hoover indicates that products are to be broken into pulpwood and sawtimber. It is unclear how the a dbh break would be appropriate as a tree of sawtimber size is comprised of both sawlogs and pulpwood logs.  |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please address verifier findings.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | We tested the potential bias of the DBH-based saw/pulp breakdown, vs the volumetric breakdown (as reported by FVS). See "UTK FVS data demo pulp_saw breakdown.xlsx" Note that the DBH-based breakdown consistently estimate a higher percentage in saw volume vs the volumetric breakdown (not surprising, because the DBH-based breakdown ignores smaller upper stem diameters that would be classified as pulp). This treatment is conservative, because a higher saw fraction means higher storage and less emissions. It can be expected that project activities will have higher harvest intensity in the baseline, and consequently lower net harvest emissions in the baseline using the DBH-based breakdown as the basis for calculating longterm storage in harvested wood products. |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team reviewed the response and the workup. While the assumption made is conservative where the project and baseline both focus their activities on a sawtimber market, this would not necessarily hold if a project were to extend rotations (for sawtimber), while baseline plots were doing shorter pulp rotations (e.g. U.S. south pellet mill areas). The appendix has no covariate to ensure similar milling is done, so it would be unable to accurately address this item.   |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier findings and clarify how the DBH approach would be conservative in the case described by the audit team.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | see narrative response in "narrative responses IFM methodology.doc"   |

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| <b>Aster Global Findings - Round (01 September 2021)</b>           | <b>3</b> | The audit team reviewed the response and the narrative and related support. It is unclear how the two worst case scenarios are truly worst case scenarios, as for the pine workup it is effectively a small pine sawtimber rotation being compared to a longer pine sawtimber rotation, rather than a pine pulpwood rotation being compared to a long pine sawtimber rotation. For the hardwood stand the comparison is likely more accurate however, a longer case is even more likely appropriate. Note this item will also be brought to verro to ensure that a de minimis demonstration is allowable for this element. |
| <b>Round NCR/CL/OFI</b>  | <b>3</b> | CL: Please clarify how the workups used are extreme in response to audit team findings. Please provide evidence that with a more extreme example the results are still de minimis.   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |          | see "narrative responses IFM methodology Sep2021"  |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>4</b> | This item is pending Verra Response about the appropriateness of a de minimis demonstration.   |
| <b>Round NCR/CL/OFI</b>  | <b>4</b> |  |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |          |  |
| <b>Aster Global Findings - Round (03 November 2021)</b>            | <b>5</b> | Verra confirmed on a call that the approach for de minimis demonstration was appropriate for this item. The audit team reviewed the provided more extreme examples and confirm that the items are de minimis.  |

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| <b>Item Number</b>   | <b>47</b>  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | $NC_{wp,SF,i,t}$   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | FFCP_Methodology_6Nov2020.docx   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | This parameter is expressed as $NC_{wp,SF}$ . Please update appropriately. |
| <b>Round NCR/CL/OFI</b>  | <b>1</b><br>CL: Please address in line with findings.                      |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | equation 6 amended to include subscript $i,t$                              |
| <b>Aster Global Findings - Round (16 April 2021)</b>                       | <b>2</b><br>The audit team confirmed the update.<br>This item is closed.   |

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| <b>Item Number</b> | <b>48</b> |
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| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  |   | NC <sub>wp,OF,i,t</sub>   |
| <b>Requirement Met (Y, N or Pending)</b>                                   |   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> |   | FFCP_Methodology_6Nov2020.docx  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    |   | This parameter is expressed as NC <sub>wp,OF</sub> . Please update appropriately. |
| <b>Round 1 NCR/CL/OFI</b>  | 1 | CL: Please address in line with findings.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |   | equation 6 amended to include subscript I,t                                       |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2 | The audit team confirmed the update.<br>This item is closed.                      |

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| <b>Item Number</b>   | 49  |   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>Report Body:</b> Unless applying a merited deviation, please complete all sections using Arial or Franklin Gothic Book 10.5 point, black, regular (non-italic) font. |   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Pending   |   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Appendix A is written in 11 point font rather than 10.5.  |   |
| <b>Round 1 NCR/CL/OFI</b>  | 1   | NCR: Please correct in line with methodology template requirements.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |   | font to be changed to 11 point after all technical items resolved     |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2   | This item will remain in pending until completed review of all items. |
| <b>Round 2 NCR/CL/OFI</b>  | 2   |   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |   |   |

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| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         |   |
| <b>Round 3 NCR/CL/OFI</b>  |   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |   |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>          |   |
| <b>Round 4 NCR/CL/OFI</b>  |   |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |   |
| <b>Aster Global Findings - Round 5 (03 November 2021)</b>          | Based on discussions with Verra these items will be addressed during submittal and will be closed out from these items. |

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| <b>Item Number</b>   | 50  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>Relationship to Approved or Pending Methodologies</b>  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | Y   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | "...and are set out in Table 2.1 below, ": The numbering doesn't match with "Table 1: Similar Methodologies".   |
| <b>Round 1 NCR/CL/OFI</b>  | CL: Please address verifier comments.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | Table 2.1 reference changed to Table 1  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | The audit team confirmed that this was updated correctly: "Seven methodologies were identified, and are set out in Table 1 below...".<br><br>This item is closed. |

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| <b>Item Number</b>  | 51                   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | <b>Contents Page</b> |



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| <b>Requirement Met (Y, N or Pending)</b>                                   | Pending  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | Table of contents while similar does not use table of contents from the methodology template.                                |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>NCR: Please correct in line with methodology template requirements.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | TOC to be reformatted after all technical items resolved   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2<br>This item will remain in pending until completed review of all items.   |
| <b>Round 2 NCR/CL/OFI</b>  | 2  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | 3  |
| <b>Round 3 NCR/CL/OFI</b>  | 3  |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>                  | 4  |
| <b>Round 4 NCR/CL/OFI</b>  | 4  |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 5 (03 November 2021)</b>                  | 5<br>Based on discussions with Verra these items will be addressed during submittal and will be closed out from these items. |

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| <b>Item Number</b>  | 52                |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | <b>VCS Header</b> |
| <b>Requirement Met (Y, N or Pending)</b>                                  | Pending           |

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| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | The template header is missing from a couple of pages.  |
| <b>Round 1 NCR/CL/OFI</b>  | 1 NCR: Please correct in line with methodology template requirements.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | ensure VCS header on all pages after all technical items resolved   |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2 This item will remain in pending until completed review of all items.   |
| <b>Round 2 NCR/CL/OFI</b>  | 2   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         |   |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | 3   |
| <b>Round 3 NCR/CL/OFI</b>  | 3   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b>         |   |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>                  | 4   |
| <b>Round 4 NCR/CL/OFI</b>  | 4   |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b>         |   |
| <b>Aster Global Findings - Round 5 (03 November 2021)</b>                  | 5 Based on discussions with Verra these items will be addressed during submittal and will be closed out from these items. |

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| <b>Item Number</b>  | 53  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | <b>4 APPLICABILITY CONDITIONS:</b> Applicability conditions must not contain procedures or obligations upon the project proponent. Rather, they must be conditions against which project eligibility can be determined at the time of validation and must not require the project proponent to undertake ongoing actions to ensure continued eligibility. |
| <b>Requirement Met (Y, N or Pending)</b>                                  | N   |

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| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | The third requirement methodology applicability condition implies the need to undertake ongoing action in order to meet the requirement. This is not in keeping with the requirement of the methodology template.      |
| <b>Round NCR/CL/OFI</b> 1  | CL: Please address verifier comments.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | text added to applicability condition "Note that the absence of changes in hydrology and soil disturbance exceeding 10% of the project area resulting from the project activity must be verified on an ongoing basis." |
| <b>Aster Global Findings - Round (16 April 2021)</b> 2                     | This item was addressed while on a call in December. The requisite changes have been addressed to remove an ongoing requirement. The item has been addressed.  |

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| <b>Item Number</b>   | 54  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | For performance methods, this section must specify the technologies and/or measures that can be implemented (in order to achieve substantial performance improvement within the sector) under the methodology.  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | The required language does not occur within the methodology.  |
| <b>Round NCR/CL/OFI</b> 1  | CL: Please clarify how the existing language is in line with the requirement.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | details on the performance method, and relevant applicability conditions, are in Appendix A (now formatted to VCS template)   |
| <b>Aster Global Findings - Round (16 April 2021)</b> 2                     | The template specifies this language must be detailed in Section 4. While similar language may exist elsewhere it is the audit team's understanding that it must exist in line with the template requirements.  |
| <b>Round NCR/CL/OFI</b> 2  | CL: Please address verifier comments.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Regarding this finding, we submitted an email to Verra on May 6 2021 requesting their help in resolving. We received a response on June 7 2021, advising that Verra would be making near term revisions to its rules and requirements related to performance benchmarks and the methodology template (that would help resolve this finding), and instructing us to proceed with the validation with this finding unaddressed. |
| <b>Aster Global Findings - Round (01 September 2021)</b> 3                 | Pending Verra review.   |
| <b>Round NCR/CL/OFI</b> 3  |   |

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| Round 3 Response from Methodology Developer (DD Month YYYY) |  |
| Aster Global Findings - Round 4 (03 November 2021)          | Pending Verra review.  |
| Round 4 NCR/CL/OFI  |  |
| Round 4 Response from Methodology Developer (DD Month YYYY) | With regard to specifying technologies/measures, we have added examples of IFM practices that can be expected to produce improvements over business as usual, under applicability conditions (Section 4), as agreed via communication with Amy Schmid of Verra on 21 Jan 2022. |
| Aster Global Findings - Round 5 (03 November 2021)          | The audit team reviewed the modifications and confirm it was inline with the approach outlined by Verra. The item has been addressed.  |

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| Item Number   | 55  |
| VCS Methodology Requirements 19 September 2019, v4.0 (Description)  | <b>4 APPLICABILITY CONDITIONS:</b> This methodology is not applicable under the following conditions:   |
| Requirement Met (Y, N or Pending)                                   | Y   |
| Evidence Used to Assess (Location in PD/MR or Supporting Documents) | Methodology   |
| Aster Global Initial Findings (14 December 2020)                    | It is unclear why item three does not fall under this language rather than "... under the following conditions"   |
| Round 1 NCR/CL/OFI  | CL: Please clarify how the existing language is in line with the requirement.   |
| Round 1 Response from Methodology Developer (DD Month YYYY)         | applicability conditions now grouped under "The methodology is applicable under the following conditions:" and "This methodology is not applicable under the following conditions:" |
| Aster Global Findings - Round 2 (16 April 2021)                     | The change has been confirmed within the revised methodology. The item has been addressed.  |

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| Item Number   | 56   |
| VCS Methodology Requirements 19 September 2019, v4.0 (Description)  | <b>5 PROJECT BOUNDARY:</b> Methodology Template Table 2. |
| Requirement Met (Y, N or Pending)                                   | Y  |
| Evidence Used to Assess (Location in PD/MR or Supporting Documents) | Methodology  |

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| <b>Aster Global Initial Findings (14 December 2020)</b>            |   | The application of table 5.1 and 5.2 in the methodology rather than table 2 as presented within the methodology template requirements leads to discontinuities in the sinks, sources and reservoirs as would have been defined in the required table. While it has been previously noted that Verra is ok with this approach to disaggregate, the table into two tables, continuity in sources/sinks/reservoirs and gases should be maintained. |
| <b>Round NCR/CL/OFI</b>  | 1 | CL: Please address verifier comments.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b> |   | Table layout follows VCS-approved ALM Methodology VM0042  |
| <b>Aster Global Findings - Round (16 April 2021)</b>               | 2 | The audit team confirms it follows the general flow of the ALM methodology, however the ALM methodology calls out gases for all SSRs, in line with the VCS methodology template. Where as this methodology only includes it for sources. Please update in line with the ALM methodology or seek guidance from Verra that further changes are not needed.  |
| <b>Round NCR/CL/OFI</b>  | 2 | CL: Please address verifier comments.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |   | Deviation from template granted by Verra on May 5 2021  |
| <b>Aster Global Findings - Round (01 September 2021)</b>           | 3 | The audit team confirmed the verra deviation. The item has been addressed.  |

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| <b>Item Number</b>   | 57   |   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>APPENDIX X: Performance Method - Applicability Conditions</b> |   |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N  |   |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |   |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It is unclear where this element occurs in Appendix A            |   |
| <b>Round NCR/CL/OFI</b>  | 1  | CL: Please clarify how the existing language is in line with the requirement.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         |  | details on the performance method, and relevant applicability conditions, are in Appendix A (now formatted to VCS template) |

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| <b>Aster Global Findings - Round 2 (16 April 2021)</b>             | <p>The template requires the following:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Projects implement technologies and/or measures that cause substantial performance improvement relative to the crediting baseline and what is achievable within the sector. It is unclear where this detail is described within Appendix A.</li> </ul>                                  |
| <b>Round NCR/CL/OFI 2</b>  | CL: Please address verifier comments or seek additional guidance from Verra.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> | Regarding this finding, we submitted an email to Verra on May 6 2021 requesting their help in resolving. We received a response on June 7 2021, advising that Verra would be making near term revisions to its rules and requirements related to performance benchmarks and the methodology template (that would help resolve this finding), and instructing us to proceed with the validation with this finding unaddressed.   |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         | Pending Verra review.   |
| <b>Round NCR/CL/OFI 3</b>  |   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |   |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>          | Pending Verra review.   |
| <b>Round NCR/CL/OFI 4</b>  |   |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> | Non-additional activities are excluded on the basis of their outcomes relative to the business as usual baseline established in the matched control plots. Following guidance provided by Amy Schmid of Verra on 21 Jan 2022, in Appendix A, we have added language to clarify that additionality of IFM activities is demonstrated based on comparative outcomes vs the matched control, and we provide some illustrative examples to explain. Further, with regard to specifying technologies/measures, we have added examples of IFM practices under applicability conditions (Section 4). |
| <b>Aster Global Findings - Round 5 (03 November 2021)</b>          | The audit team reviewed the modifications to the applicability conditions and confirm that the approach is sound and in line with the template. The item has been addressed.  |

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| <b>Item Number</b>  | 58  |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b> | <b>APPENDIX X: Performance Method - Baseline Scenario</b> |
| <b>Requirement Met (Y, N or Pending)</b>                                  | N   |

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| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It is unclear where this element occurs in Appendix A  |
| <b>Round 1 NCR/CL/OFI</b>  | 1<br>CL: Please clarify how the existing language is in line with the requirement.   |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | details on the performance method, and relevant baseline, are in Appendix A (now formatted to VCS template)  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | 2<br>Provide the following information with respect to the baseline scenario:<br><ul style="list-style-type: none"> <li>• Provide a description and analysis of the current distribution of performance within the group of emitters to which the methodology and performance benchmark is applicable, including current trends in performance.</li> <li>• Describe the alternative baseline scenarios that were identified and the process followed to determine the most plausible baseline scenario or an aggregate baseline scenario for the project activity. It is unclear where this detail is described within Appendix A.</li> </ul>  |
| <b>Round 2 NCR/CL/OFI</b>  | 2<br>CL: Please address verifier comments or seek additional guidance from Verra.  |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Regarding this finding, we submitted an email to Verra on May 6 2021 requesting their help in resolving. We received a response on June 7 2021, advising that Verra would be making near term revisions to its rules and requirements related to performance benchmarks and the methodology template (that would help resolve this finding), and instructing us to proceed with the validation with this finding unaddressed.  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | 3<br>Pending Verra review.   |
| <b>Round 3 NCR/CL/OFI</b>  | 3  |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b>         |  |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>                  | 4<br>Pending Verra review.   |
| <b>Round 4 NCR/CL/OFI</b>  | 4  |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b>         | The methodology uses a dynamic performance benchmark. Per the new VCS Methodology template v4.1, the following are required: <ul style="list-style-type: none"> <li>o Procedure that projects must follow to set out the baseline scenario based on control data including the required source(s) for control data, the approach for projects to match control data with monitored data (including an acceptable range for matched data) and the frequency with which projects must update the control data.</li> <li>o Justification for how and why the identified source(s) of control data represent the most plausible baseline scenario. Both of these items are treated in detail in Appendix A.</li> </ul> |

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| <b>Aster Global Findings - Round 5 (03 November 2021)</b> | The audit team confirms the approach applied is in line with the dynamic performance benchmark. Further, the audit team confirms the detail in the baseline section is in line with the required elements. The item has been addressed. |
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| <b>Item Number</b>   | 59   |
| <b>VCS Methodology Requirements 19 September 2019, v4.0 (Description)</b>  | <b>APPENDIX X: Performance Method - Performance Benchmark</b>  |
| <b>Requirement Met (Y, N or Pending)</b>                                   | N  |
| <b>Evidence Used to Assess (Location in PD/MR or Supporting Documents)</b> | Methodology  |
| <b>Aster Global Initial Findings (14 December 2020)</b>                    | It is unclear where this element occurs in Appendix A  |
| <b>Round 1 NCR/CL/OFI</b>  | CL: Please clarify how the existing language is in line with the requirement.  |
| <b>Round 1 Response from Methodology Developer (DD Month YYYY)</b>         | details on the performance method, and performance benchmark, are in Appendix A (now formatted to VCS template)  |
| <b>Aster Global Findings - Round 2 (16 April 2021)</b>                     | <p>Provide the following information with respect to the performance benchmark:</p> <ul style="list-style-type: none"> <li>• Provide a discussion and evaluation of the tradeoff between false negatives and false positives in selecting the level of the performance benchmark metric. Describe objectively and transparently the evidence used, experts consulted, assumptions made, and analysis (including numerical analysis) and process undertaken in determining the selected level of the performance benchmark metric. Include a summary of the expert consultation process noting that the full expert consultation report must be attached as a separate document or provided in an appendix.</li> <li>• Where proxy metrics or conditions for the performance benchmark metric are used, demonstrate 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.</li> </ul> <p>It is unclear where this detail is described within Appendix A.</p> |
| <b>Round 2 NCR/CL/OFI</b>  | CL: Please address verifier comments or seek additional guidance from Verra.   |
| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b>         | Regarding this finding, we submitted an email to Verra on May 6 2021 requesting their help in resolving. We received a response on June 7 2021, advising that Verra would be making near term revisions to its rules and requirements related to performance benchmarks and the methodology template (that would help resolve this finding), and instructing us to proceed with the validation with this finding unaddressed.  |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>                 | Pending Verra review.  |



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| Round<br>NCR/CL/OFI   | 3 |  |
| Round 3 Response from<br>Methodology Developer<br>(DD Month YYYY) |   |  |
| Aster Global Findings -<br>Round<br>(03 November 2021)            | 4 | Pending Verra review.  |
| Round<br>NCR/CL/OFI   | 4 |  |
| Round 4 Response from<br>Methodology Developer<br>(DD Month YYYY) |   | The methodology uses a dynamic performance benchmark, and does not use proxy metrics. Per the new VCS Methodology template v4.1, the following is required: o explain and justify the level of the performance benchmark metric in comparison to the control data (e.g., X% above average unit of input, output, sequestration or carbon stock change). The performance benchmark metric is set as the average carbon stock change in the matched control data, which represents the average business as usual practice *in similar forest stands* and a logical value against which to assess improvements in performance - additional text has been added under Performance Benchmark in Appendix A to clarify this. |
| Aster Global Findings -<br>Round<br>(03 November 2021)            | 5 | The audit team confirms the approach applied is in line with the dynamic performance benchmark. Further, the audit team confirms the detail in the performance benchmark section is in line with the required elements. The item has been addressed.   |

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| Item Number   | 60  |
| VCS Methodology<br>Requirements<br>19 September 2019, v4.0<br>(Description) | 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. |
| Requirement<br>Met<br>(Y, N or Pending)                                     | N   |
| Evidence Used to Assess<br>(Location in PD/MR or<br>Supporting Documents)   | Methodology Template  |
| Aster Global Initial<br>Findings<br>(14 December 2020)                      |   |
| Round<br>NCR/CL/OFI   | 1   |
| Round 1 Response from<br>Methodology Developer<br>(DD Month YYYY)           |   |
| Aster Global Findings -<br>Round<br>(16 April 2021)                         | 2   |
| Round<br>NCR/CL/OFI   | 2   |

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| <b>Round 2 Response from Methodology Developer (DD Month YYYY)</b> |   |
| <b>Aster Global Findings - Round 3 (01 September 2021)</b>         |   |
| <b>Round 3 NCR/CL/OFI</b>  |   |
| <b>Round 3 Response from Methodology Developer (DD Month YYYY)</b> |   |
| <b>Aster Global Findings - Round 4 (03 November 2021)</b>          |   |
| <b>Round 4 NCR/CL/OFI</b>  |   |
| <b>Round 4 Response from Methodology Developer (DD Month YYYY)</b> |   |
| <b>Aster Global Findings - Round 5 (03 November 2021)</b>          | The audit team noted that the version of the template currently applied is not in line with the current methodology template version. |
| <b>Round 5 NCR/CL/OFI</b>  | NCR: Please update the methodology to the latest methodology template.  |
| <b>Round 5 Response from Methodology Developer</b>                 | Methodology updated to vs 4.1.  |
| <b>Aster Global Final Findings</b>                                 | Update to the latest methodology template confirmed.  |

# 8 APPENDIX B – ASSESSMENT OF PUBLIC COMMENTS

## Comment 1

**Submitted by:** Alexandra Kosiba  
**Organization:** State of Vermont  
**Country:** USA

*This comment was received via email to Verra.*

I am very supportive of the proposed methodology by TNC, AFF, TerraCarbon and others for the Family Forest Carbon Program. This program will allow smaller landowners to sell carbon offsets; in a state like Vermont where 80% of forests are privately held, but mostly of small acreage, this an important step to have more forest carbon offset projects.

I would suggest that, as least for states in New England, the minimum project size of 50 acres be reduced. In Vermont, we have a current use tax abatement program (Use Value Appraisal) for actively managed forests with a state-approved forest management plan, where 25 acres is considered the minimum enrollment. If you refer to the report below, Department of Forests, Parks and Recreation found that harvesting that occurred on private lands had a mean size of 62 acres (maximum: 481 acres, minimum: 2 acres, median: 31 acres).

[https://fpr.vermont.gov/sites/fpr/files/Forest\\_and\\_Forestry/Forest\\_Based\\_Business/Library/Assessment%20of%20Timber%20Harvesting%20and%20Forest%20Resource%20Management%202012\\_FINA\\_2.Pdf](https://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Forest_Based_Business/Library/Assessment%20of%20Timber%20Harvesting%20and%20Forest%20Resource%20Management%202012_FINA_2.Pdf)

Reducing the minimum size to 25 acres would allow all landowners enrolled in Vermont’s current use program to be eligible to sell forest carbon.

**Response from TNC:**  
 Cam will email to express appreciation.

There is no minimum project acreage to use this methodology. Applicability condition #4 of the methodology requires that any forested properties >50 acres owned by participating landowners that the landowner has not enrolled in the project must have a management plan. This is to control the risk of activity shifting leakage.

**Aster Global Findings:**  
 The first part of this comment was to express support of the methodology. Therefore, no changes to the methodology were needed.

The commentor noted they believed the minimum size for a project in the methodology was 50 acres. However, the methodology does not have a minimum size. Therefore, no changes to the methodology were needed.

## Comment 2

**Submitted by:** Mani Moktan

**Organization: Green Growth Consulting Firm**

**Country: Bhutan**

*This comment was received via email to Verra.*

Comments on the Improved Forest Management Practice VCS Methodology Version 4.0

4 Applicability conditions

2) “improved forest management practice” will constitute “commercial harvest” which reduces biomass and consequently carbon stock to a level (may be below the baseline). This affects carbon/CO<sub>2</sub> sequestered and credits. What level of harvest needs to be allowed that are considered sustainable in the local management plans) e.g., certain % of the annual increment of the project area stands?

How to account, trees missing due to illegal cutting prevalent in tropical forests?

5) ≥ 50 contiguous acres...while contiguous acres/area is possible in plantation forests or natural stands that are uniform in age, composition, and structure but natural forests (both degraded & stocked) is highly variable? How to account age-class stands where GHGs sequestration capacity varies by stands?

5 Project boundaries

Table 5.1: Selected carbon pools.

Soil organic carbon pool... not expected to be subject to significant change due to the project activity? This is correct in plantation forests but in natural forest significant accumulation of above ground herbaceous biomass occurs over a period (50-100 years), and organic carbon matter deposits cannot be avoided.

6 Baseline scenarios

e) Baseline plots from the “outside project area” must be located in the same eco-region. This is too large in space, where environmental and social conditions vary much making the paired test invalid. The paired plots and its monitoring and statistical test demands that composite control plots are adjacent to project plots.

Appendix B: There should be SOP (Standard Operating Procedure) for composite treatment plots as well.

**TNC Response:**

The methodology is intentionally not prescriptive on the type of management or level of harvest conducted as part of the project activity. These are decisions that a project developer must make based on best available science and silvicultural practice.

In forests remaining forests, significant accumulations or emissions of soil organic carbon are not expected as a result of forest management/harvest practices. This is supported by many scientific reviews and IPCC 2006GL.

It is not necessary for control plots to be adjacent to treatment plots. It is important to understand that the matching approach is not intended to produce exact matches for each treatment (project) plot, but to instead to produce a sample population of sufficiently similar "best" matches to assess collective impacts. The power of the approach is at the level of the sample population, not at the level of any individual matched pair.

**Aster Global Findings:**

The commentor noted they wanted more prescriptive or restrictive allowable IFM practices to ensure levels do not drop below the baseline. The developer intentionally has left the IFM practices as not prescriptive. The validation and verification process will ensure the projects are achieving their allowable sequestered carbon goals. The developer has taken due account of the comment, but no changes were required as a result. The additional comment about illegal cutting prevalent in tropical forests will be mitigated by verification events and proper application of the risk tool.

The commentor noted they believe SOC would change in natural forests and should be accounted. The developer asserted the literature supports no change. As the comment did not provide further evidence for its claim, no changes were needed to the methodology.

The commentor noted the baseline plots should be adjacent to the project plot due to environmental and social conditions are more similar. However, the developer noted the approach does not compare plots to plots, but sample populations to sample populations. Thus, the developer took due account, and no change to the methodology occurred.

**Comment 3**

**Submitted by: Chandler Van Voorhis**  
**Organization: GreenTrees, LLC**  
**Country: USA**

*This comment was received via email to Verra.*

As the leading developer in the U.S. of a forestry project that includes over 500 landowners, we champion efforts to provide options to small and medium landowners. However, it is important to make sure we have a consistent bar for crediting landowners. That way we can ensure the integrity of the market. There are four areas this methodology needs to address:

1. While Verra does state that a minimum 30 year term is required, there is no legal or contractual mechanism to ensure any minimum period (and Project Developer is marketing it to landowners as a 20 year commitment)
2. Intentional reversals from harvesting are treated the same as an unintentional reversal from a natural disaster
3. There is no requirement to report reversals or that a landowner that causes a reversal by harvesting has to replace credits
4. In the event an intentional reversal does occur through harvesting, there is no reporting mechanism, and even if all the emissions reductions from a project are reversed, the project is not terminated until 15 years have passed without a verification at which point credits equal to those not verified for the last 15 years are retired from the buffer pool account (kicking the can down the road for 15 years).

If the four areas are not strengthened, it calls into question quality issues that can cause market confusion. By addressing and strengthening these four areas, we can create a consistent bar, ensuring quality and access by small and medium landowners.

**TNC Response:**

Under the VCS system, contracts with participating landowners are not defined in a methodology but rather in the Project Description and reviewed as part of the validation audit. Any project/program that

the methodology developer applies this methodology will adhere to the VCS longevity requirements (30 years) as laid out in the VCS AFOLU Non-permanence Risk Tool.

Reversals and permanence are dealt with through the VCS standard, not through individual VCS methodologies. Any project utilizing this methodology must follow the corresponding rules of the VCS. In addition, because this methodology utilizes composite control plots to represent the baseline, which are measured rather than modeled, natural disturbances are equally likely to occur and to have GHG impacts quantified in the baseline and project scenario.

VCS 3.2.15-3.2.17 lay out the rules for reporting and quantification of loss events (reversals). The VCS uses a pooled AFOLU non-permanence buffer system as an insurance mechanism for such events. Credits are replaced from this buffer. These procedures are part of the VCS standard and not covered by VCS methodologies.

Any project/program using this methodology should have contracts in place with landowners and a monitoring system such that intentional reversals are disincentivized and that any international reversals must be reported to the proponent. This is not covered by a VCS methodology but rather would be covered by a VCS Project Description and would be audited by the validation/verification body conducting the validation and verification audits of the project.

Email to Commenter:

Per guidance from Verra, the VCS Project Longevity requirement of a minimum of 30 years is applied at the grouped project scale and individual project activity instances can be of a shorter duration. The FFCP has in place enforceable contracts with landowners for the length of the contract. Project longevity will be dealt with at the grouped project scale. Presumably the commenter is concerned about permanence. The FFCP program is designed to address permanence through multiple approaches including, i) incentives for landowners to reenroll at the end of their 20 year contract, ii) a focus on changing long term forest management practices for family forest owners to climate positive practices by helping landowners get forest management plans for the first time ever and by incentive payments that cover the opportunity cost of switching from high grading to sustainable forestry (this helps cover risk even if a landowner does not reenroll). Permanence in the VCS system is dealt with through the VCS AFOLU Non-Permanence Risk Tool which assesses an ex ante contribution to the VCS pooled AFOLU buffer account based on the risk of several types of reversals. The FFCP team is exploring novel permanence approaches with Verra that would allow for ex post assessment of reversals and corresponding replacement with credits. If these approaches are not taken, the FFCP will make an appropriate contribution to the AFOLU buffer pool corresponding to the relatively short project longevity. Finally, please note that VCS's project longevity and permanence requirements are not a part of this new methodology and in the VCS system are dealt with at the level of the VCS standard itself. The FFCP would demonstrate conformance to these requirements in the PD during validation and not through validation of this new methodology.

Reversals and permanence are dealt with through the VCS standard, not through individual VCS methodologies. For the FFCP (which is a program that will use this methodology, but is not synonymous with the methodology), an intentional reversal during the crediting period would be detected through ex post monitoring of carbon stock change in permanent plots. If this were to occur it would reduce the GHG benefit claimable by the FFCP during that verification period. Intentional (and unintentional) risk of reversals after the crediting period are dealt with through the VCS AFOLU pooled buffer system. A project with a higher reversal risk contributes significantly more credits to the buffer. As mentioned previously,

the FFCP team is exploring possible approaches with Verra to monitor for ex post reversals after the crediting period has ended, which would add even greater assurance of permanence than currently exists in the VCS system.

**Aster Global Findings:**

The commentor noted there is no legal or contractual requirement in the methodology for a 30-year project commitment. The developer correctly asserts that the PD and validation audit will confirm the projects are in compliance with the required 30-year timeframe. No changes to the methodology were needed.

The commentor noted there was no differentiation between the treatment of certain types of intentional and unintentional reversals. The assessor replied to them via email noting the VCS Standard non-permanence risk tool will address reversals, and that the composite plots are equally likely to catch natural disturbances. The email further stated they would explore ways to monitor these after the crediting period, thus showing the assessor took due account of the comment. No changes to the methodology were needed.

The VCS Standard does have mechanisms for reversals to be reported. The assessor took due account, but no changes to the methodology were needed.

**Comment 4**

**Submitted by: Maria Fernanda Buitrago Acevedo**

**Organization: South Pole**

**Country: Colombia**

*This comment was received via email to Verra.*

Dear Verra,

We reviewed the methodology for Improved Forest Management and we found a couple of questions/comments that we would like to share with you:

1. Permanence issue:

The methodology states the following:

"Stock Change: For all activities, stock change is directly monitored in paired permanent treatment (representing the project scenario) and control plots (representing the baseline scenario), permitting GHG emission reductions to be estimated independently for every sample unit (or pair). A control is represented by a collection of sample plots outside of the project area that in combination match the initial conditions of each paired treatment plot and represent the baseline scenario. Ex post monitoring of control plots provides a more robust estimation of impacts, compared to model- or default-driven approaches, that will reflect the effects of exogenous factors like climate and timber markets on achieved emission reductions. "

Comment: Composite controls must be established in the same type of forest (baseline),

- Does this mean that the project owner needs to own additional areas (probably nearby the project area), where the baseline activity must continue, to can compare and have the paired plots?

- How can we assure the permanence of the baseline for the entire crediting period? Since the baseline is supposed to be outside the project area, and it might not be under the control of the project owner?

What would happen if all the surrounded areas are transformed to other land uses, and the baseline scenario disappears completely?

- How close by the composites need to be?
- What are the requirements for the composite control (with respect with project plots). i.e distance to between the composite controls and the project controls (i.e. how many km are allowed?), site index differences, slopes, species composition?

So far the requirements about the establishment of the composite plots is not clearly defined in the methodology, and this could leave too much room to interpretations, which could lead to variable auditing and verification processes

Thank you very much for considering our comments and questions

**TNC Response:**

The baseline plots are not measured in an area owned and managed by the project owner. This would be impractical. The methodology is dependent on a continuous national forest inventory to source baseline (control) plots. Provisions are provided for sample control plots that become invalid (due to land use change).

All requirements are specified in detail in Appendix A. The methodology is currently only applicable in the US, but could be revised to expand its application to other countries with continuous national forest inventories (e.g. Mexico, Vietnam).

**Aster Global Findings:**

The commentor noted the baseline plots outside the project area are subject to various conditions and may end up revising the actual baseline condition during the crediting period. The developer replied that the baseline plots use data from a continuous national forest inventory, and the assessor notes this should sufficiently ensure non-biased baseline samples. The provisions provided in the methodology will ensure relevant plots become invalid, if necessary. No changes to the methodology occurred as a result.

The developer took due account and noted Appendix A includes information to answer the commentor's questions. No changes to the methodology occurred.

**Comment 5**

**Submitted by: Connie Best**

**Organization: The Pacific Forest Trust**

**Country: USA**

*This comment was received via email to Verra.*

Thank you for the opportunity to provide comments on the above-referenced proposed methodology for quantifying greenhouse gas (GHG) emissions reductions through Improved Forest Management for purposes of crediting as offsets to GHG emissions.

The Pacific Forest Trust is a forest conservation organization dedicated to protecting the public benefits of America's forests in partnership with forest owners, agencies and communities. We have been advocating for leveraging the climate benefits of forests to mitigate climate change since our inception 27 years ago, and have played a significant role in developing GHG methodologies, projects and related public policy, including the development of California's Compliance Offset Protocol: U.S. Forest Projects. We continue to advise forest owners, policy makers and other stakeholders in this regard.



We strongly support creating incentives for family forest owners to actively manage their forests for climate benefits, including both mitigation and adaptation. Offset projects that provide real, permanent and independently verifiable GHG reductions can underwrite small landowner's related changes in forest management. Therefore, any new methodology for GHG quantification bears careful consideration.

We have reviewed the subject methodology as presented and our comments are as follows:

- It is an intriguing approach that bears further scrutiny due to its apparent relative simplicity which could allow for wide participation, especially by smaller forest owners.

- Unfortunately, the presentation is so bare bones, it is difficult to understand the methodology with any degree of certainty. It would benefit significantly from charts or other graphics to illustrate the approach; and from providing examples. Absent a more thorough presentation, stakeholders lack sufficient information to understand much less endorse this novel approach.

- Further, certain material information is unexplained and therefore lacks justification. For instance, the formula for Uncertainty in Section 8.5 includes “-15%” without any explanation.

- The Monitoring section does not state clearly how long monitoring is to continue. Indeed, nothing in the document identifies how long anything is to continue. The crediting period is not addressed. GHG reductions that last 100 years is the international standard and one VCS acknowledges. There is nothing in the information provided that addresses how this will be

attained. The duration of a forest-based emission reduction is crucial to its reality as forests are inherently dynamic systems, with natural and human-caused fluctuation in carbon stocks. A particular forest practice may have many social or ecological benefits but its GHG benefits may be either over-credited or under-credited depending on the period. GHG measurement may be a snapshot in time, but it is the length of the data set that is important in an inherently fluctuating system. Being silent on the period for project measurement and monitoring makes the methodology meaningless from the perspective of forest-based GHG quantification.

- The latter comment may speak to the structure and requirements of the VCS Program which to us seems to compartmentalize critical elements that are inherently intertwined in a robust and credible GHG forest offsets regime (i.e., project length, crediting period, monitoring program, permanence risk, insurance against reversals, etc.). One cannot understand and comment on the physique of an elephant only seeing the legs without the rest of the body. It seems critical to us that the methodology proponent provide supplemental information to paint the full picture of at least one instance where they intend to implement the methodology.

- The lack of clarity of the reasonableness of the methodology is further clouded by the potential of its use in the context of grouped projects. Having particular projects on different properties – ones intended to only last for 20 years to begin with – be permitted to enter and exit a group compounds the risk of having any real, lasting GHG benefits accrue within the parent group.

In summation, we feel that the proponents need to provide a more thorough exposition of both the methodology and the related aspects of project design and then undergo further public review before VCS takes further steps to approve this approach.

Forest based offsets offer opportunities for real and enduring GHG emissions reductions critical to solving the climate crisis. However, crediting short term practices is insufficient to meet the necessarily high standard to function as an offset, however beneficial socially or ecologically the practices may be. We need to keep in mind that credited GHG emissions reductions that are packed and sold as offsets, are then used by entities to achieve “carbon neutrality”. Therefore, a forest-based offset needs to be reasonably equivalent to a direct GHG emissions reduction – otherwise more GHGs will be emitted under the guise of a false “neutrality”. That would be tragic.

**TNC Response:**

We agree. The public comment process and the methodology validation process are to ensure that the methodology is rigorous and credible.

The methodology is designed to be simple and applicable to a wide range of forestry practices. However, there are new and innovative approaches not currently in other methodologies. We agree that a document, separate from the methodology, which included graphics and examples would be beneficial to explain how the methodology works in practice. We will consider developing such a document in the future.

The 15% (half width of the 95% confidence interval) references the VCS standard uncertainty threshold, beyond which confidence deductions are applied to credit accounting. Rule and justification is provided in the VCS Methodology Requirements 2.4.1.

All requirements of the VCS program/standards must be met for each project developed by a project proponent, including project length, crediting period, monitoring requirements, and permanence. These VCS requirements must be addressed by project proponent in the project documentation and reviewed by an accredited verification body during the initial validation/verification audit to ensure all VCS requirements are met. Thus, these VCS requirements are not repeated in the methodology as it is not necessary or required.

"Verra does not require that supplemental information be provided detailing an example of methodology implementation as part of the public review process or the VVB assessment process. However, one example of where this methodology is intended to be used is the Family Forest Carbon Program see: <https://www.forestfoundation.org/family-forest-carbon-program>

Verra requires a qualified validation/verification body (VVB) perform a rigorous assessment of methodology elements. To ensure the environmental integrity of any project that might use a methodology, Verra conducts an in-depth review, and an approved VVB assesses each proposed methodology to determine conformance with VCS Program requirements and sector-specific best practices. "

"Under the VCS system, contracts with participating landowners are not defined in a methodology but rather will be included in the Project Document. Any project/program that a developer applies this methodology must adhere to the VCS longevity requirements (30 years) as laid out in the VCS AFOLU Non-permanence Risk Tool or the project/program will not pass the validation audit. Permanence is not covered by this methodology as it is a part of the VCS standard. A project will describe how they meet VCS permanence requirements in a VCS Project Description and would be audited by the validation/verification body conducting the initial validation and verification audit of the project."

See above responses. Also, Verra does not require that supplemental information be provided detailing an example of methodology implementation as part of the public review process or the VVB assessment process. However, one example of where this methodology is intended to be used is the Family Forest Carbon Program see: <https://www.forestfoundation.org/family-forest-carbon-program>

We agree with the commentor's comments about the opportunity the forest-based offsets to address climate mitigation and the risks if these offsets do not meet rigorous standards, such as those offered through credible programs such as VERRA. The responses above address the concerns raised by the commentor - please see the responses above.

**Aster Global Findings:**

The first part of this comment was to express intrigue of the approach of the methodology. Therefore, no changes to the methodology were needed.

The commentor requested additional graphs and visuals to detail the approach. The developer took due account and explained that the methodology is designed to be simple and applicable to a wide range of practices. They did agree that graphics could be helpful and will consider developing something like this in the future. No changes to the methodology were needed as a result.

The commentor noted an uncertainty percentage, and the developer explained how this was further defined in the VCS Standard, thus taking due account of the comment. No changes to the methodology were needed.

The commentor noted a lack of timeline and measurement requirements, but the developer explained these are defined in the VCS Standard (which all projects must meet) and will be explained in the PD and MR, which are validated and verified against the full measure of requirements. The developer took due account, but no changes were required to the methodology.

The commentor further noted their desire for supplemental information, but the developer correctly stated Verra does not currently require this additional supplemental detail. The assessor notes this comment may be better served if directly provided to Verra. However, the developer did provide an example of where the methodology may be used, and thus took due account of the comment. The developer further noted that Verra-approved VVBs must be qualified by Verra, and conformance is confirmed during the V/V processes. No changes were required to the methodology as a result.

The commentor noted there is a risk grouped projects will not adhere to the requirement in the methodology for a 30-year project commitment. The developer correctly asserts that the PD and validation audit will confirm the projects are in compliance with the required 30-year timeframe. No changes to the methodology were needed.

The VCS Standard does have mechanisms to ensure permanence via the non-permanence risk tool. The assessor took due account, but no changes to the methodology were needed.

The final comment was a summary of previous comments, the developer took due account as noted above, and no changes to the methodology were needed.

The commentor further iterated their concern for forest-based offsets to be real and robust. The developer notes the Verra program has a robust validation and verification process to assure GHG emissions reductions are real. Due to the nature of the VCS Program and Standard, no changes to the methodology occurred as a result of this overall comment.

**Comment 6**

**Submitted by: Gordon Vermeer**

**Organization: SilviaTerra**

**Country: USA**

*This comment was received via email to Verra.*

Re: methodology currently under development and open for public comment, titled 'Methodology for Improved Forest Management'

To whom it may concern,

Thank you for the opportunity to comment on this methodology as it progresses through your review process. Our team members at SilviaTerra are leading experts in forest biometrics, with 10 years of experience serving the nation's largest forest owners and stakeholders with biometric analysis.

We applaud efforts to make natural capital markets more accessible to all landowners. We support this methodology's goal of increasing small landowner participation in forest carbon markets and hope the following comments will help contribute to the development of this proposed methodology.

Effective baselining is required to demonstrate additionality in improved forest management projects. Section 3.12 of the most recent VCS Standard says, "The baseline scenario shall be accurately determined so that an accurate comparison can be made between the GHG emissions that would have occurred under the baseline scenario and the GHG emissions reductions and/or removals that were achieved by project activities." In addition, a credible baseline is also crucial for avoiding adverse selection of program participants. A baseline that can be "gamed" results in reduced climate impact because landowners can receive credit for carbon removal or reduced emissions that are not additional.

Our comments are focused on the integrity of baseline construction and uncertainty estimation in the methodology as currently proposed. We believe clarifying or resolving these will help ensure credible additionality and objectivity of project proponent calculations.

1. Propagation of uncertainty in equation 10

Uncertainty in element-level (individual composite plot) baseline values is not integrated in equation 10, which may result in substantial underrepresentation of the variance in the total additional carbon estimate.

The proposed methodology does not specify a complete variance estimator incorporating variance arising from the selection and weighting of inputs to the composite plot elements. Since the term  $\Delta\text{CO}_2 \text{ bsl},i,t$  is itself a derived estimator with variance, the propagation of that variance should be accounted for.

2. Regression to the mean

By construction, the composite plot selection and averaging technique in the proposed methodology may result in substantial shrinkage toward the mean and in a biased baseline assessment relative to paired sample plots.

The admirable intent of this methodology seems to be to create highly specific baselines for each treatment plot. However, the more FIA plots that are used to construct each composite plot, and the more evenly those plots are weighted, the more likely it is that the composite value would regress toward the mean and be a poor indicator of true baseline. We expect project proponents would benefit from additional guidance on how to address this concern, to mitigate the possibility that with identical inputs, two different project proponents could arrive at materially different baselines.

3. Feasibility of plot selection

The composite plot selection constraints in the proposed methodology may yield too few eligible plots to produce a robust baseline estimate.

This methodology relies on the construction of "composite plots" to establish a baseline. It assumes that there is sufficient density of FIA data to inform a credible baseline estimate for every enrolled property. This may not be a valid assumption.

There are many FIA plots, but not an infinite number of them. This methodology proposes filtering the FIA plots by distance to "treatment plot", forest type, site class, and many other variables. By the time all of these filters have been applied, there may be a very small number (or even zero) plots remaining from which to construct a composite plot. If a composite plot is constructed from a small number of constituent FIA plots, the variance in the composite average may be quite high, rendering it an unstable estimate of the baseline. There is certainly a tension between filtering FIA plots to match the treatment plot as closely as possible and the need to include a sufficient number of plots in the composite to achieve a stable estimator. Striking this balance may not always be possible. The methodology does not indicate what course of action ought to be taken when very few plots match a treatment plot.

#### 4. Backward-looking vs. forward-looking baselines

A time lag in composite plot measurements may substantially bias calculated baseline values. This methodology seems to assume that future economic conditions will be similar to those of the past. There are obvious cases in which this is unlikely to be true. For example, in the Lake States region of the US, where many mills have shut down recently, it is likely that harvesting activity over the next ten years will be much less than the prior ten years because there is no longer a viable market for the standing timber.

A hypothetical adversarial project proponent could use this methodology to enroll properties in areas where mills have just shut down. The backward-looking composite baseline may reflect more aggressive harvesting (and thus lower levels of carbon stocking) than the forward-looking depressed economic situation after the mill shut down. The forward-looking timber harvesting activity may be lower (and thus higher levels of carbon stocking) simply because regional markets have declined. By enrolling properties in areas like this, the proponent could get credit for "additional" growth due to market conditions rather than additional climate impact.

#### Conclusion

In summary, our view is that this methodology could improve its rigor of baseline determination and estimation of uncertainty. We are excited to see new approaches proposed for engaging all landowners in forest carbon markets. This is an area where innovation is much needed to achieve the scale of climate impact that our society demands.

#### **TNC Response:**

Regarding equation 10, we are revising to make clear that the bsl variance term represents the variance of the (larger) sample population of \*constituent\* control plots  $ij$  (whereas the wp variance term represents the variance of the population of treatment plots  $i$ ).

Uncertainty related to selection and weighting of inputs is not directly assessed, but is addressed at the stage of assessing covariate balance of the matching outcome, for the sample population of matched pairs. Standardized difference of means (SDM) is calculated for each of the 6 covariates, and the match result deemed valid where no SDM exceeds 0.25. If the match is deemed invalid, the matching procedure is repeated, reducing  $k$  from 10 to 9, and thereby reducing bias (but decreasing precision, that will be directly assessed on an ex post basis), and so on until a valid match is obtained. Uncertainty in the

matching process is not typically accounted for in matching studies (see Stuart 2010, 5.3). Stuart, E.A., 2010. Matching methods for causal inference: A review and a look forward. *Statistical science: a review journal of the Institute of Mathematical Statistics*, 25(1): 1-29.

While regression to the mean has been an issue with some matching studies (e.g. assessment of the Head Start program where matches were made on previous test results), we are confident that our design minimizes this by not matching on the basis of the output variable, and by selecting covariates with which stock change outcomes are fairly invariant. The matching approach does not produce exact matches for each treatment plot, and that is not our intent – the power of the approach is at the level of the sample population of matched pairs. Each individual pair is only a “best” match, and the methodology appropriately does not report impacts at this scale. The methodology is best applied at a landscape or program scale, where reporting at that scale can leverage a population of matched pairs representing multiple stands.

This is a good point, and we have been working through a series of demos to ensure that the donor pool selection process permits sufficient sample sizes to work with (without degrading matching outcomes). Appendix A has been revised from the previous version circulated for public comment. Three important changes: (1) geographic proximity has been moved to a matching covariate, (2) the donor pool filters (i.e. exact matches) may now be relaxed in a stepwise fashion to produce a minimum of 50 donor plots to work with (in practice, in our demos, we have had repeated success producing sufficient donor pools and covariate balance without employing the relaxation safeguard) and (3) provision to reduce  $k$  to achieve covariate balance (explained above).

A time lag in remeasurements is unavoidable, but the problem is minimized because it can only happen once, at the very beginning, if the first FIA plot measurement cycle spans an inflection point produced by a market or policy change. The lag time issue will be minimized by having a large population of control plots (hence  $k$  starting at 10:1) on different remeasurement cycles (i.e. some being remeasured every year). The big issue of baselines being driven by fixed historic conditions (a much bigger, intractable issue with the ARB, ACR and CAR methodologies) is one we have deliberately set out to address. The baseline will respond over time (with minor lags relative to the 20+ year crediting periods) to changing economic conditions as they affect the FIA plots representing the control case.

**Aster Global Findings:**

The commenter questioned uncertainty and possible variance underrepresentation in Equation 10. The developer took due account of the comment, explaining uncertainty related to selection and weighting of inputs is not directly assessed, but it is addressed at the stage of assessing covariate balance of the matching outcome for the sample population of matched pairs. The developer noted peer-reviewed literature discussing uncertainty in the matching process is not typically accounted. However, the developer did revise Equation 10 (as a result of this and other comments) to clarify that the  $bsl$  variance term represents the variance of the (larger) sample population of constituent control plots  $ij$ . Note the original Eq. 10 later became Eq. 13. The assessor believes the response to be sufficient to address the comment and take due account. The developer was supported by the literature but made an appropriate clarifying change to the methodology.

The commenter noted the intent of the methodology is admirable but may result in shrinkage toward the mean and a biased baseline. The developer took due account by acknowledging this has been an issue with other matching studies but that this methodology is different, in that it does not match on the basis of the output variable, and it selects covariates with stock change outcomes that are fairly invariant. The developer was confident in their approach and took due account of the comment in explaining how the



matching process will not likely result in bias. No changes to the methodology resulted from this comment.

The commenter expressed concern that FIA plots are not infinite, and filtering them for certain selection criteria may result in too few (or no) plots for baseline data. The developer took due account and noted it was a good point. The developer revised Appendix A of the methodology to ensure the donor pool selection process yields a sufficient sample size, to include a minimum of 50 donor plots. The assessor notes the developer took due account, and the changes that occurred to Appendix A were sufficient to address the concern of baseline plot sample size.

The commenter expressed concerns about time lags in relation to baseline plot re-measurement and how the current baseline condition may not be reflected if the plot is not re-measured at the exact time of changing conditions. The developer took due account of the comment and noted that while there may be some time lag, the problem is minimized as it would only happen once, at initial measurement of the plot, if the plot represented an inflection point in the market. It would further be minimized by having a large population of control plots on different re-measurement cycles. They finished by noting how this methodology is much more deliberate in trying to capture actual baseline conditions when they change, which sets it apart from all the other fixed baseline methodologies currently on the market. The assessor agrees, and no changes to the methodology occurred as a result of this comment.

#### Comment 7

**Submitted by: Paula Swedeen**

**Organization: Conservation Northwest**

**Country: USA**

*This comment was received via email to Verra.*

Thank you for the opportunity to comment on the proposed IFM methodology. Conservation Northwest has been working in the northwestern United States on protecting, connecting, and restoring wildlands and wildlife of the region for the past 30 years. Our organization recognizes the importance of small forest landowners to conserving the natural heritage of the regions in which they live, and their potential contribution to solving the climate crisis. In addition, I have many years of professional experience in the development and implementation of forest carbon protocols and projects over the past twelve years of my 30-year career. CNW recognizes that accessible and easy to implement financial incentives play a key role in supporting the ability of small forest landowners to remain on the landscape and manage their lands for the ecosystem services from which the public benefits. The development of a forest carbon offset protocol which serves this class of landowners is therefore of great interest, and potentially of great benefit.

We provide the following comments with the intent to ultimately support a system in which small forest landowners can receive legitimate payments for managing their lands for long-term climate benefits.

1. The approach of establishing a set of control plots in the non-project area to correspond to plots in the project area and then crediting the increase in carbon stocks in the project area compared to the non-project area plots as baseline makes sense and has promise. Being able to treat the baseline carbon stocks as dynamic rather than static can provide a more accurate picture of how much a project's activities are actually improving carbon stocking compared to the real non-project scenario. Characterizing and quantifying baseline conditions can be very difficult under many protocol approaches. This approach has the potential to avoid both over and under crediting projects compared to what is happening in the

surrounding landscape. We support this approach contingent upon other methodological and program rules which support long-term protection of project-based carbon stock gains, and which can account for short-term changes in baseline conditions which do not represent an actual trend. Therefore a crucial piece of missing information from the methodology is the minimum time period for assessing and crediting actual carbon gains in the project area compared to the baseline situation.

2. The methodology as presented makes it difficult to assess how the particulars of participating landowners obligations in an area and the timing by which they enter and exit the program will impact the ability of the program to claim that offsets generated are real and permanent. In the absence of specific aggregation rules and an understanding of individual landowner obligations in terms of time commitment and penalties for early exit, it is impossible to determine how probable it is that the methodology will result in durable gains of carbon stocks within a project area that in reality sequester long-lived greenhouse gas emissions for which a project is claiming to offset and thus negate the impact of those emitted GHG's on atmospheric warming.

3. The question of how the aggregation scheme will work to ensure permanence is particularly important. Maintaining stocks against which credits are issued for at least 100 years is the international standard, and is what is required in the only regulatory-grade offset program in the U.S. (that administered by the California Air Resources Board). It will be important for this methodology to spell out how risk to non-permanence is going to be assessed within an aggregation scheme. The idea that buffer credits generated will be adequate to cover any risk of too many landowners wishing to exit the project early, or of not enough landowners enrolling in later years to maintain the carbon stocks that were issued VCU's earlier in the program's life should be assessed with a critical eye. Scenarios should be gamed out in which interest of landowners does not endure over a 100 year period such that early exiting projects reverse their additional carbon gains and those reversals are not compensated for by later participants. How does the program maintain integrity under such a scenario? How can such an outcome be guarded against?

4. Wood product decay factors: recent research conducted for carbon dynamics of harvested wood products in the Pacific Northwest should be incorporated in the quantification factors used to calculate the amount carbon remaining in both long and short-lived wood products, at least for that region. The amount of mass remaining after 100 years for softwood lumber used in section 9.1 is 0.51. Research described in Hudiburg et al., 2019 (Hudiburg, T.W., Law, B.E., Moomaw, W.R., Harmon, M.E. and Stenzel, J.E., 2019. Meeting GHG reduction targets requires accounting for all forest sector emissions. Environmental Research Letters, 14(9), p.095005) suggests that this factor should be significantly lower.

**TNC Response:**

Thanks for the positive feedback regarding project crediting. Regarding crediting time period, under the VCS system, any project/program that the methodology developer applies this methodology to will adhere to the VCS longevity requirements (30 years) as laid out in the VCS AFOLU Non-permanence Risk Tool.

Under the VCS system, contracts with participating landowners are not defined in a methodology but rather in the Project Description and reviewed as part of the validation audit. Any project/program that the methodology developer applies this methodology to will adhere to the VCS longevity requirements (30 years) as laid out in the VCS AFOLU Non-permanence Risk Tool.

Permanence is not covered by this VCS methodology as it is a part of the VCS standard. A project will describe how they meet VCS permanence requirements in a VCS Project Description and would be audited by the validation/verification body conducting the validation and verification audits of the project.



We have followed the California Forest Offset Protocol calculation methodology for HWP carbon calculations. This methodology uses Forest Service statistics on product end uses and half-lives to determine the climate impact of temporary storage (see Hoover et al (2014), Section 6.5.1 for an explanation). The Hudiburg et al (2019) study only estimates products in-use and only looks at the amount remaining after 100 years, which does not account for the climate benefit of temporary storage of storage at 50 or 80 years, for example. However, if you look at the comparisons of just products in use, the two numbers are similar. Hudiburg et al estimates that 19% of the harvest from Oregon over the last 100 years still remains in products in use. The 100-year average metric from Hoover et al for PNW softwood sawlog (a principal component but not the only component of PNW harvest) is 0.298, with 12.9% remaining in use after 100 years.

**Aster Global Findings:**

The commenter provided positive feedback of the dynamic baseline approach and noted they want to see the minimum time period for assessing and crediting carbon. The developer took due account and noted these longevity requirements are defined in the VCS AFOLU Non-permanence Risk Tool. The assessor agrees, and no changes to the methodology occurred.

The commenter was concerned about timing and contractual obligations of the landowners, but the developer noted these are defined and assessed during validation/verification and as laid out in the VCS AFOLU Non-permanence Risk Tool. the assessor agrees, and no changes occurred to the methodology.

The commenter expressed concerns about permanence. The developer correctly noted that permanence is assessed during validation/verification as part of the VCS program. The assessor agrees, and no changes occurred to the methodology.

The commenter noted they believe wood product decay factors from recent literature should be utilized. The developer noted they use approved U.S. Forest Service data, which is generally more conservative when it comes to wood products in use. They took due account by examining the provided research and speaking to the concern directly. No change to the methodology resulted.

**Comment 8**

**Submitted by: Julian Bauer**

**Organization: EP Carbon**

**Country: USA**

*This comment was received via email to Verra.*

Verra Secretariat,

EP Carbon is pleased to submit feedback on the proposed Methodology for Improved Forest Management V1.0.

We support the creation of a flexible IFM methodology capable of providing streamlined development options and increasing enrollment of forestland into carbon offset projects. We recognize the Methodology for Improved Forest Management V1.0 has the potential to connect the various Verra-approved IFM methodologies together in a way that reduces the barrier to enrollment by simplifying development.

That being said, we feel additional work can be done to flush out the methodology to ensure project impacts are fully accounted for.

Our initial set of comments focus on the methodology's treatment of leakage, outlined in Section 8.3.

As the methodology is written, leakage is restricted to market leakage; activity shifting leakage is assumed to be zero per applicability condition 4 (see below).

Applicability condition 4 (pg. 8):

Within one year of the project start date, all forested properties > 50 contiguous acres under the control of the project area landowner(s) and potentially subject to harvest, including areas outside of the project area, must be managed under a plan approved by a state or federal agency, where applicable, and/or subject to oversight by a third party. The management plan must explicitly demonstrate that management practices are not unsustainable. Examples meeting the above criteria include, but are not limited to, a Forest Stewardship Plan, certification under the Forest Stewardship Council (FSC), certification under the Sustainable Forestry Initiative (SFI), or membership in the American Tree Farm System (ATFS).

It is unclear how this applicability condition prevents leakage.

1. How does lack of continuity prevent leakage? Couldn't someone harvest tracts that are near each other but not necessarily contiguous but packaged as single timber sale? Or harvest with their neighbor's property as recently happens with small landowners.
2. What is preventing a landowner that owns 80 acres of forestland from enrolling 40 of these acres in a carbon project and then liquidating the timber on the other 40 acres, effectively resulting in 100% activity-shifting leakage?
3. How does a management plan approved by a state or federal agency prevent activity shifting leakage? Couldn't a management plan simply be redefined to increase timber yield to offset timber losses that may be incurred by a carbon project?
4. What is a "project area landowner?" What if the project area landowner is a Limited Liability Partnership between three individuals? Does this applicability condition extend to these individuals?
5. Shouldn't uncertainty be derived from equation 8, the calculation of net emissions reductions? Where does equation 10 come from? If I derive the uncertainty from equation 8, I see that there are many sources of uncertainty not included in equation 10 and that equation 10 probably underestimates uncertainty:
6.  $Var(ER_t) = A_t^2 * Var(ER_{\bar{t}}) + Var(LK_t)$  <--- Where is  $Var(LK_t)$  in equation 10? Why doesn't  $A_t^2$  appear in equation 10?
7. Does  $\sqrt{Var(ER_{\bar{t}})} =$  equation 10? Can this be independently confirmed?
8. The matching outcomes described in section 6 are conditional on a set of purposively selected covariates. However, equation 10 does not explicitly address uncertainty in the matching outcome. Why not, isn't this potentially a significant source of uncertainty?
9. Further, the matching outcomes could be easily gamed by limiting the set of covariates during model selection. Further criteria should be specified to ensure there are representative covariates in the selection set in a sufficient quantity to minimize uncertainty.
10. What additional requirements are needed for aggregation? What eligibility criteria for new project activity instances must be addressed in a grouped project?

11. Consider equation 9. Assume I have a 5,000-acre carbon project and that I liquidate all timber the year prior to starting the project. As there is no applicability condition to prevent me from doing this, it appears that I can just get credit for regrowth even though I unsustainably clearcut 5,000 acres the year before. As a young forest, my regrowth is probably going to accrue carbon faster than the control group. Should this be allowed?

12. If I own 40 acres of forestland with no legal restrictions to harvesting (meeting current applicability conditions) but it is landlocked without timber egress, then is my project additional? In this case, wouldn't the carbon have accrued anyway as I cannot harvest any trees? Shouldn't this case be handled to ensure additionality?

13. Further, what if the species on my property are not merchantable; there is no timber market for my trees. Is the project additional as there wouldn't be any harvesting?

We appreciate the opportunity to provide comments on the proposed methodology and welcome follow-up discussions on any of the above. Please feel welcome to reach out with any questions or concerns.

**TNC Response:**

Text will be revised (contiguous to be removed).

The intent of having all properties of an entity under a management plan subject to third party oversight is to preclude activity shifting leakage manifested as unsustainable harvest (like "liquidation"). This same approach to addressing activity shifting leakage is applied in the American Carbon Registry IFM methodology.

Solely having a management plan is insufficient, we agree. The applicability condition further specifies that "the management plan must explicitly demonstrate that management practices are not unsustainable", which would not allow for an unsustainable "compensatory" harvest on another forested property under the entity's ownership outside the property.

Good point. We are revising to specify how this entity is defined.

No uncertainty is accounted for area estimation or leakage, in keeping with other VCS AFOLU methodologies. Leakage, and uncertainty around leakage, cannot be directly estimated. Accuracy of area estimation is addressed through QA/QC procedures detailed in the parameter table for parameter At.

See above.

Yes, eq 10 is uncertainty of  $ER_{\bar{t}}$  (calculated in eq 9). The estimator applied in eq 10 is the same estimator applied to propagate error of remeasurements or of paired samples, including the covariance of the pairwise matches. Note that we are revising eq 10 to make clear that the  $bsl$  variance term represents the variance of the (larger) sample population of \*constituent\* control plots  $ij$  (whereas the  $wp$  variance term represents the variance of the population of treatment plots  $i$ ).

Uncertainty related to selection and weighting of inputs is not directly assessed, but is addressed at the stage of assessing covariate balance of the matching outcome, for the sample population of matched pairs. Standardized difference of means (SDM) is calculated for each of the 6 covariates, and the match result deemed valid where no SDM exceeds 0.25. If the match is deemed invalid, the matching procedure is repeated, reducing  $k$  from 10 to 9, and thereby reducing bias (but decreasing precision, that will be directly assessed on an ex post basis), and so on until a valid match is obtained. Uncertainty in the matching process is not typically accounted for in matching studies (see Stuart 2010, 5.3).

Stuart, E.A., 2010. Matching methods for causal inference: A review and a look forward. *Statistical science: a review journal of the Institute of Mathematical Statistics*, 25(1): 1-29.

Appendix A prescribes the covariates that must be used. This is intentionally prescriptive to avoid opportunities for gaming, to ensure that the matching process is standardized and eliminate user judgement.

Guidance on grouped projects is outside the scope of the methodology, and is detailed in the VCS Standard.

Your control must be matched to initial conditions at the project start date. Your initial conditions in this case would be young post clearcut forest, which would be paired to control plots with similar age, regen stocking and (lack of) overstory/commercial stocking. Stock change in the treatment and control would be expected to be similar and no credits would be awarded.

We agree that this is an example of a non-additional project, however, a performance benchmark (as the control is applied in this methodology) implicitly acknowledges that there will be some false positives (wrongly included non-additional projects), but that the collective outcome on application (where we would expect the scenario described to be relatively uncommon) yields a reasonable balance of false positives and false negatives (wrongly excluded additional projects).

This case is addressed through application of matching criteria related to same forest type and commercial stocking (see Appendix A), which would match the property to control plots with similar species composition and stocking.

**Aster Global Findings:**

The commentor expressed concern about activity shifting leakage being zero in accordance with Applicability Condition 4. The developer took due account and noted the word "contiguous" would be removed. However, it appears the entire applicability condition was removed due to other Findings in the assessment process, and the methodology now includes a simple equation to account for both market and activity shifting leakage with a leakage factor based on reductions in timber market supply. The assessor believes the concerns in the comment were addressed by this change to the methodology.

The commentor noted a scenario where the landowner enrolls half of their land in the project, but then liquidates timber on the other half. The developer noted that is why a management plan on all landowner lands is required, which is similar to how other registries' IFM methodologies work. However, later during the assessment, the developer reached out to authors of the published studies of the relevant IFM market leakage assessment. The authors clarified their market leakage factors include both traditional market leakage and what VCS defines as activity shifting leakage. Therefore, the developer removed the requirement for a management plan, as the activity shifting leakage risk was already accounted for in the default factors. The assessor believes the developer took due account, and the default factor additions to the methodology inherently address the concern for activity shifting leakage based on scientific studies.

The commentor expressed concern about a management plan being redefined, affecting activity shifting leakage. The developer noted the management plan requires that practices are not unsustainable, and the assessor agrees this sustainability can be confirmed at validation and verification to ensure activity shifting leakage is not occurring. However, later during the assessment, the developer reached out to authors of the published studies of the relevant IFM market leakage assessment. The authors clarified their market leakage factors include both traditional market leakage and what VCS defines as activity

shifting leakage. Therefore, the developer removed the requirement for a management plan, as the activity shifting leakage risk was already accounted for in the default factors. The assessor believes the developer took due account, and the default factor additions to the methodology inherently address the concern for activity shifting leakage based on scientific studies.

The commentor asked for a definition of project area landowner and asked what the procedure was for leakage if it was an LLP, for example. The assessor agreed that the term was vague and would revise the definition to specify how this entity is defined. However, during the assessment process, the entire applicability condition was removed, and the methodology now includes a simple equation to account for both market and activity shifting leakage, as noted above. The assessor believes the developer took due account, and the concerns in the comment were addressed by this change to the methodology.

The commentor noted potential differences in the way uncertainty is calculated that could have a discrepancy in sources. The developer noted there is no uncertainty accounted in area estimation or leakage, in line with other VCS AFOLU methodologies. Leakage cannot be directly estimated, and area estimation is addressed through QA/QC procedures. The assessor believes the developer took due account of the comment, but no changes to the methodology were needed nor occurred.

The commentor questioned a variable in Equation 8. The developer took due account but noted they had answered the question in their previous response. No change to the methodology occurred.

The commentor questioned Equation 10. The developer took due account by clarifying how Equation 10 works but also noting they will revise it to clarify the commentor's noted concern. The assessor believes this change adequately addressed the comment.

The commentor questioned uncertainty in matching outcomes of Equation 10. The developer took due account of the comment, explaining where uncertainty is assessed (at the stage of assessing covariate balance of the matching outcome for the sample population of matched pairs). The developer noted peer-reviewed literature discussing uncertainty in the matching process is not typically accounted. The assessor believes the response to be sufficient to address the comment and take due account. The developer was supported by the literature. No changes to the methodology occurred.

The commentor expressed concern about gaming in selection of the covariates, noting Section 6 of the methodology. The developer took due account and referred to Appendix A, which has a prescriptive process to avoid opportunities for gaming. This addresses the comment, and no changes to the methodology resulted.

The commentor asked about aggregation and grouped projects. The developer took due account and noted these elements are outside the scope of methodology development but included in the VCS Standard. The assessor confirms this, and no changes to the methodology resulted.

The commentor noted a scenario in which a landowner clears all their land prior to project start date, then accrues credits on rapid regrowth in a young forest. The developer noted that the control plots must be paired to initial conditions at start date, and the assessor agrees any regrowth would be like-for-like to the control (no credits), unless sustainable IFM practices were implemented. No methodology changes occurred.

The commenter noted the possibility of a non-additional project due to the marketability of the timber. The developer took due account and noted that though a small amount of false positives for the performance benchmark may occur, they will be balanced by false negatives due to the collective outcome on the application. The assessor believes this to be the case with the additionality components of the methodology, and no changes to the methodology were needed.

The commenter noted the possibility of non-merchantable trees on a property. The developer noted the matching criterion will select the same forest type and stocking, thus disallowing VCUs in that case. The developer took due account, and the assessor notes no changes to the methodology occurred as a result of the comment.