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Greenhouse Gas Project Methodology Review Report

First Assessment under the Voluntary Carbon Standard (VCS)

Client:
Face the Future

Methodology:
VCS Proposed Methodology for Improved Forest Management: Conversion of Low-productive forest to High-Productive Forest (LtHP)

Scientific Certification Systems
Lead Auditor: Kyle Holland
Technical Expert: Ryan Anderson
Technical Reviewer: Todd Frank
Report Date: 19 October 2010

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1. Introduction

This report concludes the first assessment under the VCS Double Approval Process for the Proposed VCS Methodology *Conversion of Low-productive forest to High-Productive Forest (LtHP)* authored by Silvestrum and Face the Future. This report contains five important sections pertinent to VCS and accreditation requirements. Details of the validation objectives and scope are provided in this section, while an overview of the validation process is provided in the next section. A special section provides a brief overview of the methodology and some important remarks by the validation team. Finally, the report contains sections that address findings and corrective actions, and the official validation opinion.

1.1 Objectives

The validation was performed with the following objectives.

- Assess conformance of the new methodology with VCS Standards.
- Evaluate the new methodology based on guidance given under the Voluntary Carbon Standard Program, including an assessment of VCS program requirements and the following: eligibility criteria, baseline approach, additionality, project boundary, emissions, leakage, monitoring, data and parameters, and adherence to the project-level principles of the VCS program.
- Determine the need for clarification or requests for change to the proposed new methodology.
- Determine approval status in the first independent assessment of the double approval process.

1.2 Standards used to Assess New Methodology

All methodologies (methodology elements) applying for approval under the VCS Program shall be approved via the double approval process. Per section 6.1 of the VCS standard ("VCS 2007.1"), VCS Program methodologies shall comply with all requirements in the VCS 2007.1, clause 6.1 to 6.4.4. The VCS Program Normative Document: Double Approval Process, Version 1.0 describes the requirements and steps of this process.

1.3 Methodology Criteria

SCS assessed the new methodology to ensure that all requirements of the VCS standards for the double approval process have been addressed. SCS assessed whether or not the new methodology respects the principles of the VCS standards.

Assessment included, but was not limited to, an evaluation of the methodology's inclusion of the following:

- applicability criteria that defines the area of project eligibility;
- a process that determines additionality;
- determination criteria for the most likely baseline scenario; and
- all necessary monitoring aspects related to monitoring and reporting of accurate and reliable GHG emission reductions or removals.

1.4 Methodology Scope

The scope of this validation assessment encompassed an assessment of the new methodology against the following requirements of the Voluntary Carbon Standard (VCS):

- VCS 2007.1
- VCS Guidance for Agriculture, Forestry and Other Land Use Projects (AFOLU)
- VCS Program Normative Document: Double Approval Process

The assessment was performed using the client-supplied new methodology and other supporting documentation including referenced, published scientific literature, reports and existing methodologies. The assessment was also performed using additional guidance provided by VCS.

1.5 Conflict of Interest

Prior to beginning the validation process, an evaluation was conducted to identify any potential conflicts of interest associated with the project. No potential conflicts were found for this Project.

2. Methodology Review

2.1 Assessment Team

Kyle Holland, Lead Auditor: Mr. Holland is a Verification Forester with Scientific Certification Systems and an approved VCS AFOLU expert in the categories of REDD and IFM. He is a Certified Forester (CF #3770) and is completing his Ph.D in forest biometrics and statistics at the University of California, Berkeley. Mr. Holland also possesses graduate degrees in forestry and over ten years of professional experience in both public and private forestry.

Ryan Anderson, Technical Expert: Ryan Anderson holds a BS in Environmental Science from the University of Denver and an MS in Natural Resource Science and Management with emphasis in geospatial assessment, monitoring, and modeling of forest resources. He is currently pursuing a Ph. D. in Forestry with the University of Montana's Numerical Terradynamic Simulation Group. His research focuses on the development and calibration of physiologically-based models of terrestrial ecosystem carbon, nitrogen, and water cycles.

Todd Frank, Technical Reviewer: Todd Frank is the Program Manager for SCS's Greenhouse Gas Verification Program. Mr. Frank, who has a strong background in FSC certification, emissions trading and forest carbon project development, has been active in carbon markets since 2006. Mr. Frank has formal training in ISO 14064 and ISO 19011 and is certified as a lead verifier under CAR, VCS, CCX, and CCB. He holds a master's degree in International Environmental Policy from the University of California, San Diego and a bachelor's degree in from the University of California, Berkeley.

2.2 Description of Methodology Review Process

The new methodology was assessed using a process and evaluated for conformance. The following elements of the proposed methodology were examined as part of this process:

- The VCS 2007.1 Standard, including Sections 5 and 6;
- The appropriateness and adequacy of the eligibility criteria;
- The appropriateness and adequacy of the approach for determining the project baseline;
- The appropriateness and adequacy of the approach/tools for the determination of whether the project is additional;
- The appropriateness and adequacy of the approach to define the project's physical boundary and sources and types of gases included;
- The appropriateness and adequacy of the approach for calculating baseline emissions, project emissions and emission reductions;
- The appropriateness and adequacy of the approach for calculating leakage;
- The appropriateness and adequacy of monitoring;
- The appropriateness and adequacy of monitored and non-monitored data and parameters used in emissions calculations;

- Adherence to the project-level principles of the VCS Program, overall; and
- An Assessment Report with internal technical review.

The methodology review process incorporated six parts: standards review, methodology review, comparison, corrective action, technical review and opinion. The applicable standards listed in Section 1.4 of this report were thoroughly reviewed and compared to the new methodology. Upon comparison, corrective actions were issued to improve the methodology and bring the methodology into conformance. Finally, the methodology was independently reviewed by a third, internal technical reviewer prior to issuing a validation opinion.

2.3 Types of Findings

In the cases of corrective actions, Non-Conformity Reports (NCR) were issued to the methodology developer. NCRs formally document how and why the new methodology failed to comply with the standards outlined in Section 1.4. In some cases, New Information Requests (NIR) were issued. NIRs are used to formally request information, such as: how equations were developed, the meanings of technical terms and abbreviations, referenced publications and supporting documentation. Yet in other cases, Opportunities for Improvement (OFI) were issued. OFIs are professional suggestions or observations that are not required under the standards outline in Section 1.4, however might be useful to the methodology developer.

The project developer was encouraged to respond to all NCRs, NIRs and OFIs during the course of the methodology review. Responses to NCRs were allowed sixty days (60) while responses to NIRs were allowed thirty days (30). Reponses to OFIs were optional.

3. Overview of Methodology

The new methodology, *Conversion of Low-productive forest to High-Productive Forest,* is for Improved Forest Management (IFM). The methodology is for projects based on avoiding emissions from relogging of logged over tropical forests and/or increasing carbon stocks in logged over forest areas through management. The methodology establishes a baseline scenario by quantifying timber removed and associated emissions during relogging; carbon storage in harvested wood products; and regrowth of residual stands. Either management plans or monitoring of a reference area can be used to establish the baseline scenario.

In the project scenario, changes in carbon stocks are quantified for three pools: aboveground biomass, dead wood, and wood products using repeated monitoring of sample plots and statistical analysis. Emissions due to site preparation and project implementation are quantified as well. Project net greenhouse gas benefits are estimated by comparing baseline scenario stock and emissions estimates to project scenario measurements. The methodology includes assessment of uncertainty and potential for leakage.

3.1 Remarks

During the course of the assessment, the methodology was substantially revised and improved to conform to the standard. The methodology developers should be commended for their persistent effort and commitment to the validation process.

While it is the opinion of the validator that the methodology meets all VCS requirements and is technically sound, it is recommended that the second validator in the double approval process pay particular attention to the issue of the use of reference areas in the methodology. Upon conclusion of this first validation, the methodology allows for a single reference area to be selected. Although most project developers using this methodology will likely select a reference area that results in conservative estimates, it is possible to justify and select a reference area that may result in non-conservative estimates.

The later of these two situations could be avoided by requiring project proponents to select a sample of reference areas with varying management practices and intensities rather than a single reference area. This sample-based method for establishing a baseline would likely give more accurate and less biased estimates of avoided emissions than a single reference area. Also, provided a sample of reference areas, statistical estimates of uncertainty can be made for estimated avoided emissions under the baseline scenario. Typical of many proposed methodologies, quantification of uncertainty under the baseline is difficult due to the counterfactual nature of the baseline scenario. A sample of reference areas provides an excellent opportunity to improve the quantification of uncertainty, overall. Thus while it is our opinion that a single reference area is acceptable, it is an issue that warrants further investigation by the second validator.

4. Validation Findings

4.1 VCS 2007.1 Standard

This is the overall conformance to the VCS 2007.1 Standard with specific reference to project level requirements (Section 5) and methodologies (Section 6).

4.1.1 Section 5, Project level requirements

This is the specific conformance to Section 5 of the VCS 2007.1 Standard. Most requirements of Section 5 are project-specific, however, it is clear that some of these requirements must also be addressed or further defined within methodologies. Terms relating to key project level requirements specified in the standard were evaluated for clarity in use and consistency.

Findings: The methodology addresses all project level requirements to sufficient detail. Methodology section 3.3 describes the relevant GHG sinks and reservoirs while both section IV and V describe GHG sources. Types of data for intended users are outlined in section VIII while accuracy and uncertainty are addressed in section IX. Overall, the methodology is conservative in it assumptions.

Initially, it was not clear how the project's start date or crediting period were determined. These were later clarified (see NIR 20 of 21 dated December 14, 2009 and OFI 3 of 3 dated January 7 2010). Also, it was unclear whether the methodology was applicable to grouped projects (NIR Number 19 of 21 dated December 14, 2009). These issues were clarified and the methodology was updated by the developer.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	None
New Information Requests:	NIR Number 19 of 21 Dated December 14, 2009
	NIR Number 20 of 21 Dated December 14, 2009
Opportunities for Improvement:	OFI Number 3 of 3 Dated January 7, 2010

4.1.2 Section 6, Methodologies

This is the specific conformance to Section 6 of the VCS 2007.1 Standard. Validation within this section was accomplished by reviewing the general requirements, potential carbon pools, determination of baseline, methods for determining additionality and requirements for monitoring. Many methodology requirements described in section 6 of the standard are subject to validation as described in the VCS Program Normative Document: Double Approval Process. These validation elements are presented in section 4.2 of this report in order to facilitate categorization, although they apply to both section 6 of the standard and to the double approval process.

Findings: The methodology addresses all requirements specified in VCS 2007.1. Applicability, additionality, baseline determination and monitoring are reflected in sections I through VIII. Selection and quantification methods for relevant pools are provided in these sections.

A number of issues related to selected carbon pools, applicability criteria, baseline determination, monitoring, additionality, and data quality were identified. These are discussed in section 4.2 of this report. Additionally, two OFIs were issued related to the methodology as a whole, asserting that the methodology as currently written draws from a draft methodology that is not yet approved (OFI number 1 of 2 dated December 14, 2009), and offering observations to improve the methodology's referencing and readability (OFI number 2 of 2 dated December 14, 2009).

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	None
New Information Requests:	None
Opportunities for Improvement:	OFI Number 1 of 2 Dated December 14, 2009
	OFI Number 2 of 2 Dated December 14, 2009

4.2 VCS Normative Document: Double Approval Process

These are the minimum validation elements that are listed in Section 5.1.2, *Scope of Assessment of new Methodologies* of the VCS Normative Document: Double Approval Process.

4.2.1 Eligibility Criteria

Assessment of whether the methodology's eligibility criteria are appropriate and adequate.

Findings: The VCS standard requires methodologies to include a section detailing applicability criteria that define the area of project eligibility. These criteria are found in section II of the methodology. Initially, the criteria were found to be unclear regarding the types of forests the methodology was applicable to, based on the parameters provided (see NCR number 11 of 13 dated December 14, 2009 and NIR number 1 of 2 dated January 7, 2010). Subsequently, the methodology was amended to be applicable only to evergreen tropical rainforests as defined by the FAO. Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validator that the eligibility criteria are appropriate and adequate to the scope and complexity of the methodology.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	NCR Number 11 of 13 Dated December 14, 2009
New Information Requests:	NIR Number 1 of 2 Dated January 7, 2010
Opportunities for Improvement:	None

4.2.2 Baseline Approach

Assessment of whether the approach for determining the project baseline is appropriate and adequate.

Findings: The methodology is applicable to projects in which the baseline scenario consists of logged over forests which often experience little regrowth after logging, and which may be relogged. The baseline scenario quantifies carbon stocks and emissions through either monitoring of a

reference area that is similar to the project area, a sample of reference areas, or based on a management plan and pre-relogging measurements of the project area. The assessment identified several issues related to the appropriateness and adequateness of the baseline approach.

The original writing in the methodology section describing the baseline was unclear and difficult to understand (NCR 9 of 13 dated December 14, 2009; NCR 4 of 17 dated January 7, 2010; OFI 2 of 3 dated January 7, 2010). Several parameters were undefined (NCR 4 of 13 dated December 14, 2009; NCR 8 of 17 dated January 7, 2010), and notation was used inconstantly (NCR 10 of 13 dated December 14, 2009; NCR 17 of 17 dated January 7, 2010). Additionally, the methodology was unclear about units, calculation methods, and measurement techniques for some parameters (NIR 18 of 21 dated December 14, 2009; NIR 6 of 21 dated December 14, 2009; NCR 8 of 17 dated January 7, 2010;), including the units used for harvest volumes and the time and method by which harvest volumes are recorded (NIR 5 of 21 dated December 14, 2009; NCR 11 of 17 dated January 7, 2010). The methodology developer added summary sections, unified notation, and clearly defined terms and parameters in later revisions of the methodology.

Initially, the criteria for demonstrating similarity of the reference area and the project area were deemed insufficient because some important qualifying criteria were optional or not included in the methodology (NCR 1 of 13 dated December 14, 2009; NCR 4 of 17 dated January 7, 2010; NCR 5 of 17 dated January 7, 2010), the methodology did not stipulate reference area size (NCR 6 of 17 dated January 7, 2010), and the methodology did nothing to ensure that management in the reference area was not affected by the area's status as a reference area (NCR 6 of 17 dated January 7, 2010). The methodology developer strengthened existing requirements for establishing a reference area and added additional requirements to address these issues.

The validator was concerned that use of a single reference area would not account for spatial variability in management practice, particularly if the reference area is of relatively small size. In response the methodology developer added minimum size requirements, additional criteria for demonstrating similarity between the reference and project areas, and the possibility of using a sample of reference areas rather than a single area (NIR 4 of 21 dated December 14, 2009; NCR 6 of 17 dated January 7, 2010). Please also see section 3.1 of this report for additional remarks regarding reference areas for estimating baseline avoided emissions.

The methodology originally used a *root:shoot ratio* to account for belowground biomass in the project scenario, but not in the baseline. Belowground biomass accounting was later removed from the methodology entirely (NCR 6 of 17 dated January 7, 2010).

The methodology accounts for change in carbon stocks due to both relogging and regrowth in the baseline. One way that stock changes due to relogging can be estimated under the methodology is by first estimating the percentage of the reference area that has been relogged. Second, the methodology estimates carbon stock changes in relogged portions of the reference based on monitoring of plots located in those areas. The rate of logging, combined with the average stock change that results from that logging is used to estimate carbon losses due to logging that would have likely occurred in the project area in the absence of the project. There were several issues related to this method. First, it was unclear how the parameter representing the percentage of the reference area that was relogged was calculated and how it was applied to determine the net carbon stock change in the baseline scenario (NIR 18 of 21 dated December 14, 2009; NCR 3 of 17 dated January 7, 2010). This was clarified by revised equations and additional explanatory language. Also, it was unclear how the plots monitored in the baseline for carbon stock change related to relogging differed from plot monitored to estimate carbon stock change from regrowth of residual stands, leading to concern that the same plots would be counted twice (NCR 3 of 17 dated January 7, 2010). The methodology developer clarified a method of stratification intended to eliminate the risk of double counting.

The validator requested copies of several references cited in the methodology. These were used to evaluate the assumptions and correct application of various components of the methodology. No additional issues were identified after reviewing the provided references (NIR 16 of 21 dated December 14, 2009).

Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validator that the eligibility criteria are appropriate and adequate to the scope and complexity of the methodology.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	NCR Number 1 of 13 Dated December 14, 2009
	NCR Number 3 of 13 Dated December 14, 2009
	NCR Number 4 of 13 Dated December 14, 2009
	NCR Number 9 of 13 Dated December 14, 2009
	NCR Number 3 of 17 Dated January 7, 2010
	NCR Number 4 of 17 Dated January 7, 2010
	NCR Number 5 of 17 Dated January 7, 2010
	NCR Number 6 of 17 Dated January 7, 2010
	NCR Number 8 of 17 Dated January 7, 2010
	NCR Number 11 of 17 Dated January 7, 2010
New Information Requests:	NIR Number 4 of 21 Dated December 14, 2009
	NIR Number 5 of 21 Dated December 14, 2009
	NIR Number 6 of 21 Dated December 14, 2009
	NIR Number 4 of 21 Dated December 14, 2009
	NIR Number 16 of 21 Dated December 14, 2009
	NIR Number 18 of 21 Dated December 14, 2009
Opportunities for Improvement:	OFI Number 2 of 3 Dated January 7, 2010

4.2.3 Additionality

Assessment of whether the approach/tools for determining whether the project is additional are appropriate and adequate.

Findings: Section 4.1.2 of the methodology and Annex 1 provide a tool to test project additionality. Several issues were raised during the validation regarding the establishment of the VCS required buffer pool and historical management practices that characterize the baseline. Both of these issues affect additionality through project's apparent risk or baseline determination. Both issues were subsequently addressed by the methodology developer.

The project did not initially specify the establishment of a buffer of non-tradable AFOLU carbon credits (NIR 21 of 21 dated December 14, 2009). The methodology was modified to require the use of the "Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination." The project initially established a 5-10 year basis for evaluating historic management practices. It was unclear whether this time period as sufficient for evaluating long term trends and periodicity in management

activities and planning (NIR 14 of 21 dated December 14, 2009; NCR 14 of 17 dated January 7, 2010). Additional requirements were added to the methodology to ensure that these factors were adequately accounted. Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validator that additionality as described in the methodology is appropriate and adequate to the scope and complexity of the methodology.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	NCR Number 14 of 17 Dated January 7, 2010
New Information Requests:	NIR Number 14 of 21 Dated December 14, 2009
	NIR Number 21 of 21 Dated December 14, 2009
Opportunities for Improvement:	None

4.2.4 Project Boundary

Assessment of whether an appropriate and adequate approach is provided for the definition of the project's physical boundary and sources and types of gases included.

Findings: The project boundary includes both the physical boundary of the project and the sources and individual types of greenhouse gasses which are accounted for by the project. Three issues were identified related to the project boundary. First, nitrous oxide was not accounted for, but the use of nitrogen based fertilizer was not prohibited from the project area (NCR 6 of 13 dated December 14, 2009). The methodology developer added an applicability condition prohibiting the use of nitrogen based fertilizer. Second, some pools were listed as optional, but no methods were given for quantifying those pools (NCR 8 of 13 dated December 14, 2009). In response, all optional pools were removed from the methodology. Finally, the dead wood pool was originally excluded from the methodology. It was determined that, based on the circumstances to which this methodology applies, it was not conservative to exclude the dead wood pool (NIR 3 of 21 dated December 14, 2009). The methodology developers added sections providing methods for quantifying dead wood carbon. Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validator that the approach to these elements is appropriate and adequate to the scope and complexity of the methodology.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	NCR Number 6 of 13 Dated December 14, 2009
	NCR Number 8 of 13 Dated December 14, 2009
New Information Requests:	NIR Number 3 of 21 Dated December 14, 2009
Opportunities for Improvement:	None

4.2.5 Emissions

Assessment of whether an appropriate and adequate approach is provided for calculating baseline emissions, project emissions and emission reductions.

Findings: Project emission reductions are calculated based on the difference between carbon stocks on site and in wood products in the project and baseline scenarios, thus accounting for carbon benefits due to the avoidance of relogging. Additionally, emissions from management activities in both the project and baseline scenarios are quantified. The regrowth of residual stands is quantified

in both cases as well. Several findings were made in regard to the methods used to quantify emissions.

The methodology does not account for carbon removed from the project site through the cutting of vines and climbers. It is the opinion of the validators that, in some circumstances, the carbon stored in this vegetation can make up a substantial portion of the aboveground biomass carbon on the site, and should consequently be accounted for. Based on a recent VCS ruling, carbon in herbaceous vegetation can be categorically excluded from measurement as long as it represents an insignificant portion of the net project GHG benefits according to VCS standards. The methodology developer was asked to update the applicability criteria of the methodology to include a statement about the significance of herbaceous vegetation (NCR 7 of 13 dated December 14, 2009; NCR 10 of 17 dated January 7, 2010).

The first draft of the methodology included standards for minimizing uncertainty in parameter choice, but did not include any methods quantifying the uncertainty in estimated emissions reductions or for applying an uncertainty based confidence deductions to ensure that issued VCUs are conservative (NCR 5 of 13 dated December 14, 2009; NIR 13 of 21 dated December 14, 2009; NIR 2 of 2 dated January 7, 2010). Based on existing VCS documentation as well as additional discussions with VCS it was determined that the VCS standard explicitly calls for quantification of uncertainty and consideration of that uncertainty in calculation of GHG removal factors (NCR 9 of 17 dated January 7, 2010; NIR 1 of 1 dated February 1, 2010). Eventually, appropriate methods for quantifying uncertainty and applying an uncertainty-based confidence deduction were added to the methodology.

The first version of the methodology did not include a section describing how the number of VCUs to be issued should be determined (NIR 9 of 21 dated December 14, 2009). An equation was later added, but it initially carried a risk of double counting emission reductions because in was based on cumulative emission reductions since the start of the project, rather than since the last time VCUs were issued (NIR 7 of 21 dated December 14, 2009; NCR 2 of 2 dated February 1, 2010).

Originally, the methodology included several errors in equations related to notation (NCR 10 of 13 dated December 14, 2009; NCR 17 of 17 dated January 7, 2010), and accounting for strata size when summing across strata (NCR 1 of 17 dated January 7, 2010). Equations were modified to resolve these issues.

Initially, the methodology contained an error in calculating a change in aboveground biomass stocks in which the total biomass stock was used rather than the change in biomass stocks. Additional equations and language clarifying the intended computations were added to the methodology (NIR 8 of 21 dated December 14, 2009; NCR 12 of 17 dated January 7, 2010).

The methodology originally allowed for using extrapolations of trends to issue monitoring reports, but did not provide any detail as to how trends were to be extrapolated or how the modeled trend estimates were to be used. The use of extrapolated trends in issuing monitoring reports was removed from the final revision of the methodology (NIR 15 of 21 dated December 14, 2009; NCR 15 of 17 dated January 7, 2010).

Finally, ambiguity as to how parameters were selected from a range of possible parameters was clarified (NCR 12 of 13 dated December 14, 2009).

Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validator that the calculation of baseline emissions, project emissions and emissions reductions are appropriate and adequate to the scope and complexity of the methodology.

Conformance: Yes ☒ No ☐ N/A ☐

Non-Conformity Reports: NCR Number 5 of 13 Dated December 14, 2009

NCR Number 7 of 13 Dated December 14, 2009

NCR Number 10 of 13 Dated December 14, 2009

NCR Number 12 of 13 Dated December 14, 2009

NCR Number 1 of 17 Dated January 7, 2010

NCR Number 9 of 17 Dated January 7, 2010

NCR Number 10 of 17 Dated January 7, 2010

NCR Number 12 of 17 Dated January 7, 2010

NCR Number 15 of 17 Dated January 7, 2010

NCR Number 17 of 17 Dated January 7, 2010

NCR Number 2 of 2 Dated February 1, 2010

Opportunities for Improvement: None

4.2.6 Leakage

Assessment of whether the approach for calculating leakage is appropriate and adequate.

Findings: Initially, the source of leakage factors for market-effects calculations was unclear. The methodology developer provided a reference to VCS literature upon which these calculations were based (NIR 17 of 21 dated December 14, 2009). The methods for quantifying leakage are adequate based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting. It is the opinion of the validators that leakage is appropriately and adequately addressed, given the scope and complexity of the methodology.

Conformance: Yes ☒ No ☐ N/A ☐

Non-Conformity Reports: None

New Information Requests: NIR Number 17 of 21 Dated December 14, 2009

Opportunities for Improvement: None

4.2.7 Monitoring

Assessment of whether the monitoring approach is appropriate and adequate.

Findings: The methodology makes use of regular monitoring of the project area and, in certain situations, a baseline area. Initially the methodology included insufficient information regarding the type and frequency of monitoring that was required in the baseline area(NCR 7 of 17 dated January 7, 2010). Later revisions of the methodology specified that baseline monitoring was to be outlined in a project-level monitoring report and that the same approach was to be taken in monitoring the baseline and project areas.

Initial versions of the methodology made use of a CDM tool for estimating regrowth rates that was deemed inappropriate to the situation in which its use was prescribed (NCR 2 of 13 dated December 14, 2009; NCR 7 of 17 Dated January 7, 2010). Later versions of the methodology eliminated the use of that tool in favor of suitable monitoring methods using a reference area.

After measurement of dead wood biomass was added to the methodology, there was concern that the methods described for measuring standing dead wood could lead to bias by accounting only for stem biomass. Additionally, the methodology required measuring stump biomass but did not

provide suitable methods for doing so. Methods for measuring standing dead wood were updated in the final version of the methodology and are now suitable (NCR 2 of 17 dated January 7, 2010; OFI 1 of 3 dated January 7, 2010).

Finally, several unclear terms were clarified (NIR 1 of 21 dated December 14, 2009; NIR 2 of 21 dated December 14, 2009).

It is the opinion of the validator that the monitoring approach is appropriate and adequate.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	NCR Number 2 of 13 Dated December 14, 2009
	NCR Number 13 of 13 Dated December 14, 2009
	NCR Number 2 of 17 Dated January 7, 2010
	NCR Number 7 of 17 Dated January 7, 2010
New Information Requests:	NIR Number 1 of 21 Dated December 14, 2009
	NIR Number 2 of 21 Dated December 14, 2009
Opportunities for Improvement:	OFI Number 1of 3 Dated January 7, 2010

4.2.8 Data and Parameters

Assessment of whether monitored and not monitored data and parameters used in emissions calculations are appropriate and adequate.

Findings: Three main issues related to data and parameters were corrected during the validation process. First, the methodology allows for a growth model to give the expected tree dimensions as a function of tree age when producing *ex ante* estimates of biomass, but did not provide any guidelines for choosing such a model. Later, the stipulation that a conservative approached should be followed was added to the methodology. This was deemed adequate, as the specific circumstances that govern model choice may vary from project to project (NIR 12 of 21 dated December 14, 2009; NCR 13 of 17 dated January 7, 2010).

Second, the methodology initially used an arbitrary test to validate allometric equations. This guidance was derived from IPCC good practice documents, but was applied without regard to the source of the original equations (NCR 16 of 17 Dated January 7, 2010; NIR 11 of 21 dated December 14, 2009). The methodology developer added the stipulation that this method of validation was only appropriate for equations derived from a biome-wide database and provided statistical methods to validate allometric equations from other sources.

Third, the methodology specifies that when biomass expansion factors are used, they should be increased by 30% for trees grown in open areas. The validator raised concerns about the conservativeness of this assumption, and the methodology developers provided additional and adequate information defending the choice (NIR 10 of 21 Dated December 14, 2009).

Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validators that the selected data and parameters are appropriate and adequate to the scope and complexity of the methodology.

Conformance:	Yes ☒ No ☐ N/A ☐
Non-Conformity Reports:	NCR Number 13 of 17 Dated January 7, 2010
	NCR Number 16 of 17 Dated January 7, 2010

New Information Requests:	NIR Number 10 of 21 Dated December 14, 2009
	NIR Number 11 of 21 Dated December 14, 2009
	NIR Number 12 of 21 Dated December 14, 2009
Opportunities for Improvement:	None

4.2.9 Adherence to the Project-Level Principles of the VCS Program

Assessment of whether the methodology adheres to the project-level principles of the VCS Program.

Findings: As referenced by section 4.1 of this report, there are no outstanding issues regarding the adherence to the project-level principals of the VCS program. Based on current scientific thinking and best practices associated with AFOLU project design and implementation, as well as carbon accounting and reporting, it is the opinion of the validators that the methodology adheres to the project-level principles of the VCS program.

Conformance:	Yes	☒	No	☐	N/A	☐
Non-Conformity Reports:	None					
New Information Requests:	None					
Opportunities for Improvement:	None					

4.2.10 Response to Public Comments

Methodology developers are required to respond to all public comments.

Findings: The methodology developers have adequately responded to all public comments submitted via the VCS Web site during the public comment period (NIR 1 of 2 Dated February 14, 2009). Please see Appendix 1 of this report: Public comments and responses.

Conformance:	Yes	☒	No	☐	N/A	☐
Non-Conformity Reports:	None					
New Information Requests:	NIR Number 1 of 2 Dated February 1, 2009					
Opportunities for Improvement:	None					

5. Validation Opinion

Following completion of SCS's duly-accredited validation process, it is our opinion that Face the Future's proposed methodology, *Conversion of Low-productive forest to High-Productive Forest*, conforms to the scope as defined in Section 1.4 of this report, namely the VCS 2007.1 Standard. As the first validators, we support all changes resulting from the second validation and specifically the methodology version 1.13 dated September 8, 2010.

……
Signature of Lead Auditor

KYLE HOLLAND, CF
……
Name of Lead Auditor

Verification Forester, SCS
…….
Position

6. Eligibility Criteria for Validators

6.1 Eligibility Criteria

The following required evidence, if available, is provided for Non-ARR AFOLU methodology elements in conformance with Section 4.7 of the *VCS Program Normative Document: Double Approval Process*.

6.1.1 Eligibility Criteria 2 for Non-ARR AFOLU

Kyle Holland is an AFOLU approved expert for the IFM project category. Kyle Holland served as lead auditor.

6.1.2 Eligibility Criteria 3 for Non-ARR AFOLU

Scientific Certification Systems has not completed at least ten project validations in any sectoral scope.

6.2 Supplied Evidence

The above supplied evidence is adequate per Section 4.7.3 of the *VCS Program Normative Document: Double Approval Process*.

7. Corrective Action Requests

Please see section 2.3 of this report for descriptions of the types of corrective action requests. Please see section 4 for references to these corrective action requests.

Non-Conformity Reports:

NCR Number 1 of 13 Dated December 14, 2009

Finding: The criteria for demonstrating similarity of the reference area to the project area are insufficient in scope and requirement. For example, meeting only conditions 2 and 3 (being under the same operational control of the same forest management entity and having comparable legal and harvesting rights) are not sufficient to assume similar changes in carbon stocks in the reference area and in the project area baseline. Condition 4 is particularly important, and it should be interpreted in terms of total carbon stocks, not only commercial timber. In addition, the reference area should be shown to have similar carbon stocks to the project area prior to the first round of logging. Finally, it must be shown that the management within the selected reference area is not affected by its selection as a reference area. The methodology developer should modify the criteria for demonstrating similarity of the area to the project area or mandate all criteria.

Proponent Response on December 28, 2009:

The criteria for demonstrating similarity have been changed into:

"Similarity of the Reference Area to the Project Area can be demonstrated through meeting the following conditions:

- *Supporting similar forest types with comparable quantities of carbon stocks before logging for the first time;*
- *Supporting comparable quantities of carbon stocks before subsequent logging and comparable predicted yields of commercial timber;*
- *Having been subjected to the same management regime for first round logging; and/or,*
- *Having comparable legal rights and harvesting rights."*

An applicability condition has been added reading:
"A reference area of similar size for which similarity with the project area can be demonstrated using criteria outlined in this methodology, and for which it can be demonstrated that the management is not affected by its selection as a reference area, will be used to derive relevant parameter values for the baseline scenario"

This satisfies the NCR because:
All 4 conditions now have to be met including the condition that similarity can be demonstrated through demonstrating "comparable quantities of carbon stocks before subsequent logging and comparable predicted yields of commercial timber"; and,

An applicability condition has been added as cited above

Auditor Response: The response does not fully address the finding. While additional requirements were added for references areas, the guidelines for choosing a reference area were deemed insufficient. Additionally, the word or was still included, even though all four criteria are required.

NCRs 4 of 17 and 5 of 17 for January 7, 2010 were issued in response.

NCR Number 2 of 13 Dated December 14, 2009

Finding: The applicability criteria assume that regrowth following repeated logging will not be normal due to colonization of climbers and vines. However, prior to a secondary harvest, growth of residual trees will occur. The methodology uses the approved CDM methodological tool "Estimation of changes in the carbon stocks of existing trees and shrubs within the boundary of an A/R CDM project activity." The applicability condition for this tool is that it may not be applied to areas within the project boundary in which significant numbers of trees and/or shrubs are expected to regenerate naturally in the absence of the project, over the project lifetime (page 2 of the tool document). Therefore to use the approved CDM methodology tool, its applicability condition must be stated in the methodology's applicability conditions or an alternative method (or tool) must be specified for estimating regrowth or growth of residual trees following repeated logging if growth is significant.

Proponent Response on December 28, 2009: *We accept the opinion that the CDM tool is not suitable to be used. However, we believe the option to cater for situations where the development of the vegetation is zero (or insignificant) after subsequent logging should remain in the methodology. Means of verification is the ex-post monitoring of the baseline in the reference area. The growth dynamics in the forest after the 1st time logging will be measured in the project area and that will be deducted from the overall net carbon benefits from the project. The methodology has been changed accordingly.*

This satisfies the NCR because the tool is no longer used and an alternative method (or tool) is specified for estimating regrowth of residual trees following 1st time logging in section 5.2. A section on regrowth after repeated logging was already included in the methodology (4.3.4)

Auditor Response: The finding has been partially addressed. The concept of monitoring the growth within the reference area and subtracting carbon accumulated in the reference area from carbon benefits of the project addresses the concern over regrowth of residual trees. However, the methodology should be more explicit about the intensity and frequency of monitoring required in the reference area, as it is not clear if monitoring of the reference area is to be approached with the same methods, intensity, and frequency as monitoring of the project area.

NCR 7 of 17 for January 7 was issued in response.

NCR Number 3 of 13 Dated December 14, 2009

Finding: The methodology specifies a root-shoot ratio in project accounting but not in baseline carbon stock estimation. A root-shoot ratio must also be used in estimating baseline carbon stocks if it is used in project accounting.

Proponent Response on December 28, 2009: *In pg 14, we state that the project accounts only for AGB and carbon stored in wood products. Therefore for equations used in project accounting, BGB is not required or included. The error has been removed.*

Auditor Response: The finding has been adequately addressed. All references to root:shoot ratio have been removed. We can expect that root biomass would increase in the project scenario relative to the baseline, so omission of root biomass is conservative.

NCR Number 4 of 13 Dated December 14, 2009

Finding: C_BSL is not defined in the methodology. The methodology developer must define C_BSL.

Proponent Response on December 28, 2009: *A section 4.5 has been added with this calculation.*

Auditor Response: The finding has not been adequately addressed. The addition does not provide

an equation for calculating C_BSL. Sections 4.3.1 and 4.3.2 describe an equation for calculating delta $C_{BSL,I}$ and Section 4.3.3 describes an equation for calculating delta $C_{BSL,I,Ir}$.

NCR 8 of 17 for January 7, 2010 was issued in response.

NCR Number 5 of 13 Dated December 14, 2009

Finding: The methodology quotes approved CDM methodologies to list good standards for minimizing uncertainty. However, it does not provide any methods for quantifying uncertainty. The methodology does not apply uncertainty-based confidence deduction to ensure that the issued VCUs are conservative. The methodology developer must describe how uncertainty is quantified and justify why an uncertainty-based confidence deduction is not applied.

Proponent Response on December 28, 2009: *We revisited the section on uncertainty and quality management and are of the opinion that it covers the 2 requirements in the VCS standard on page 20 related to this issue, being:*

1. *"When highly uncertain data and information are relied upon, the project proponent shall select assumptions and values that ensure that the quantification does not lead to an overestimation of GHG emission reductions or removal enhancements."*

And

2. *"If applicable, the project proponent shall select or develop GHG emissions or removal factors that:*
   - *…..;*
   - *take account of the quantification uncertainty and are calculated in a manner intended to yield accurate and reproducible results;"*

In our opinion the current language is guaranteeing this, if properly applied to specific project cases.

In addition, the current text in the methodology is the full section of various CDM approved methodologies and no additional material or formula's are provided in those CDM approved methodologies in the subsections itself. Therefore, if SCS insists on this point we would greatly appreciate more clarity on what is expected, whilst not raising the bar any higher than the standard set by the CDM.

Auditor Response: The finding has not been adequately addressed. The VCS standard explicitly calls for quantification of uncertainty and consideration of that uncertainty in calculation of GHG removal factors. The methodology, as written, only provides guidelines intended to minimize uncertainty. It does not provide methods to quantify uncertainty or to consider the degree of uncertainty in calculation of VCUs.

NCR 9 of 17 for January 7 was issued in response.

NCR Number 6 of 13 Dated December 14, 2009

Finding: Forest fertilization is a common management practice in some regions. Nitrogen based fertilizer has potential to increase forest productivity thereby creating an incentive for some forest managers to fertilize in order to increase carbon stocks on site. The methodology developer must describe how nitrous oxide from nitrogen based fertilizers are accounted under the baseline and project scenarios.

Proponent Response on December 28, 2009: *We agree with the stipulation on nitrogen fertilzer, and have added an applicability condition that restricts its use. See page 6.*

Auditor Response: The stipulation that the use of nitrogen based fertilizer is prohibited adequately addresses the finding.

NCR Number 7 of 13 Dated December 14, 2009

Finding: (1) The methodology assumes an applicability condition for the baseline scenario that logged-over forest in the project area is unlikely to revert to normal regrowth patterns hence the regrowth of excessive amounts of vines and climbers. (2) The methodology also assumes as an applicability condition that there is no change in carbon stocks for above and below ground biomass under the project scenario. However, the project scenario (3) assumes that vines and climbers are cut to rehabilitate logged-over natural high forest. Given assumption (3), the first two assumptions are contradictory. These applicability conditions will preclude any project that involves cutting or reducing vines and climbers. The methodology developer must clarify these assumptions or remove at least one assumption from the methodology.

Proponent Response on December 28, 2009: *The second assumption cited above is a misread of the methodology: this statement relates to NON-TREE biomass. However, we do agree that preparation for enrichment planting may involve liberation thinning and/or cutting climbers and vines that can cause emissions. Therefore, the methodology prescribes in section 5.2.1 the use of the CDM approved tool "Estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of an A/R CDM project activity". On page one of that tool, in footnote 1, the tool recalls that the Executive Board at its forty-second meeting, decided that "GHG emissions from removal of herbaceous vegetation may be considered as insignificant and hence can be neglected in A/R baseline and monitoring methodologies and tools". Vines and climbing bamboos (not to be confused with the non-climbing bamboos) qualify as herbaceous vegetation and may therefore, be omitted from quantification.*

Emissions from liberation thinning however – as rightfully pointed out by SCS in our telephone conference – need to be assessed, albeit, in light of the high levels of emissions in the baseline of relogging this is unlikely to be significant. To emphasize this notion, we amended the relevant applicability condition, which now reads:
"Changes in carbon stocks of above and below ground biomass of non-tree vegetation may be conservatively assumed to be zero for all strata in the project scenario, as well as insignificant changes in carbon stocks of above and below ground biomass of tree vegetation"
This also implies that where such changes are significant, they need to be quantified and taking into consideration. With respect to the term significant, the VCS determined that "the sum of decreases in carbon pools and increases in emissions that may be neglected shall be less than 5% of the total project GHG benefits".

On the basis of footnote 2 of the tool, we consider the tool to be appropriate for the quantification of significant emissions due to liberation thinning. That footnote reads: "The term "site preparation" as used henceforth in this document includes all activities associated with establishment of forest (or other planted vegetation) by the A/R project activity that result in emissions from existing vegetation, whether such activities are specifically mentioned or not. Such activities include clearance of existing life vegetation by felling or fire, decay of felled or burned existing life vegetation, and decay of existing life vegetation that dies as a result of competition from forest (or other vegetation) planted as part of A/R project activities. "
Section 5.2 of the methodology has been amended accordingly, as well as the relevant applicability condition.

Auditor Response: The findings have not been fully addressed. It is the opinion of the validator that vines and climbers potentially represent a significant carbon stock that should be accounted for. NCR 10 of 17 for January 7, 2010 was detailing the validator's concerns.

NCR Number 8 of 13 Dated December 14, 2009

Finding: Some pools are listed as optional, but no methods are given to quantify changes in their carbon stocks if the project proponent elects to include them. The methodology developer must provide methods for quantifying changes in carbon stocks for dead wood and litter. Further, the methodology developer must provide a method for quantifying below-ground biomass under the baseline scenario.

Proponent Response on December 28, 2009: *The methodology developer has changed those carbon pools that can be conservatively ignored from 'optional' to 'not included' or 'no'. This is with the exception of the deadwood pool, which has been changed to 'included'. Information on how the methodology accounts for this carbon pool has been included. Necessary additional parameters for monitoring have been included.*

The confusion over the root : shoot ratio in the project accounting has also been removed, so there is consistency in that below ground biomass is not accounted for either in the baseline or project scenarios.

Auditor Response: The changes address the original findings. No carbon pools are currently listed as optional, and appropriate methods are now given for quantifying changes in all required pools. Below ground biomass has been removed from the methodology.

NCR Number 9 of 13 Dated December 14, 2009

Finding: The methodology, particularly described for the baseline model, is difficult to follow. The methodology developer must attempt to construct logical and complete methods for determining baseline removals and emissions without presenting and then omitting calculations. This is critical for validation and moreover for project developers who will ultimately apply this methodology.

Proponent Response on December 28, 2009: *An additional section was added with a summary of the methodology. That section outlines the train of thought of the methodology and refers to the sections where the elements of the methodology can be found.*

In the view of the methodology developer no methods for the determination of emissions and removals have been presented for which the calculations have been omitted. If this was the case, then this has been addressed by responding to all other NCR, NIR and OFIs.

Auditor Response: The addition of summary sections has made the document more readable. Typographical and grammatical errors and unclear language still exist in the methodology.

OFI 2 of 3 for for January 7, 2010 was issued in response.

NCR Number 10 of 13 Dated December 14, 2009

Finding: Notation for stratum indices is sometimes omitted from equations. The methodology developer must make notation consistent throughout the methodology.

Proponent Response on December 28, 2009: *Page 14 and 22: no equation was found where an indice(sic) for stratum was lacking.*

Auditor Response: The response is not adequate. Several equations are still missing stratum indices.

NCR 17 of 17 for January 7, 2010 was issued in response.

NCR Number 11 of 13 Dated December 14, 2009

Finding: Several aspects of the methodology refer to parameters specific to tropical forests. The methodology developer provide parameters (or references to sources from which to obtain) parameters for non-tropical forests.
Proponent Response on December 28, 2009: *The methodology has been amended and is now only applicable to natural tropical high forest. This dismisses the obligation for the methodology developer to provide parameters for non-tropical forest types.*
Auditor Response: The changes do not fully address the finding. The addition of applicability criteria limiting the methodology to tropical high forests addresses the lack of parameters for non-tropical forests. However, the term 'tropical high forest' is not defined in the methodology, so there is still reason for concern that the methodology will be applied to forests for which the supplied parameters are not appropriate.

NCR 1 of 2 for January 7, 2010 was issued in response.

NCR Number 12 of 13 Dated December 14, 2009

Finding: A range of parameter values is given for default fuel consumption. The methodology developer must specify how the parameter is selected from this range.
Proponent Response on December 28, 2009: *The parameter from the given range is selected based upon the age (assume efficiency) of the machinery. This has been elaborated within the methodology, on page 36.*
Auditor Response: The changes adequately address the finding. Further guidelines for selecting parameters from the range have been provided.

NCR Number 13 of 13 Dated December 14, 2009

Finding: Ex-post confirmation is required of regrowth rates is required when regrowth of tree biomass following secondary logging under the baseline is not reasonably assumed zero. The methodology provides a method on page 23 and refers to the approved CDM methodological tool "Estimation of changes in the carbon stocks of existing trees and shrubs within the boundary of an A/R CDM project activity." However, this tool cannot be applied to the project area under the baseline since the baseline scenario is counter factual. The methodology developer must clarify how regrowth rates are confirmed when regrowth of tree biomass following secondary logging under the baseline is not reasonably assumed zero.
Proponent Response on December 28, 2009: *See NCR 2: we believe this to be the same issue, which is addressed in box 15 of NCR2.*
Auditor Response: We agree that these issues are closely related, and have treated them as a single issue in subsequent validation. See auditor response for NCR 2 and the additional findings issued in response.

NCR Number 1 of 17 Dated January 7, 2010

Finding: The equation for changes in carbon stocks in existing woody vegetation does not account for stratum size. This equation must somehow account for stratum size.
Proponent Response on January 24, 2010: *This equation has been amended to account for stratum size.*

$$\Delta C_{BSL} = \sum_{t=1}^{t^*} \sum_{i=1}^{M_{BSL}} \left(\left(A_{i,t} \times \Delta C_{REL,i} \right) + \Delta C_{wood-exist,i,t} \right) + GHG_{BSL-E,t}$$

$$\Delta C_{woody-exist,i,t} = \sum_{j=1}^{S} \Delta C_{woody-exist,j,i,t}$$

Second Proponent Response on February 22, 2010:

The following equations have been amended to account for stratum size.
Eq 2 (Area removed)

$$\Delta C_{BSL} = \sum_{t=1}^{t^*} \sum_{i=1}^{M_{BSL}} \left(\Delta C_{REL,i,t} + \Delta C_{woody-exist,i,t} \right) + GHG_{BSL-E,t}$$

Eq 3

$\Delta C_{REL,i,t} = A_{REL,i,t} \times (C_{harvest,i} + (C_{damage,i} - C_{DW,i}) - C_{WP,i}) \times 44/12$

Eq 10

$\Delta C_{REL,i} = A_{REL,i,t} \times ((C_{BSLpre,i} + C_{DW,pre,i}) - (C_{BSLpost,i} + C_{DW,i} + C_{WP,i})) \times 44/12$

Eq 21

$$\Delta C_{woody-exist,i,t} = A_{i,t} \times \sum_{j=1}^{S} \Delta C_{woody-exist,j,i,t}$$

Eq 35

$\Delta C_{P,i,t} = A_{i,t} \times (\Delta C_{AGB,i,t} + \Delta C_{DW,i,t} + \Delta C_{WP,i,t})$

Area weighing is only relevant for estimating mean carbon stocks across strata, see Equation 46

$$C_{BSLpre} = \frac{\sum_{i=1}^{M_{BSL}} \left(C_{BSLpre,i} * A_{REL,i} \right)}{M_{BSL} * \sum_{i=1}^{M_{BSL}} A_{REL,i}}$$

Auditor Response:
The amended equations now account for stratum size. The equations are appropriate as the methodology is written. However, they contain unit errors that propagate from other equations. For example, in equation 4:

$$C_{harvest,i} = \sum_{j=1}^{S} (V_{harvest.i,j} \times D_j \times CF)$$

(units) $m^3\ ha^{-1}\ yr^{-1}$ * $t\ d.m.\ m^{-3}$ * $t\ d.m.^{-1}$ = $tC\ ha^{-1}$ **yr^{-1}** (not $t\ C\ ha^{-1}$ as written)

The incorrect units are then given for the revised equation 3. Similar unit errors existed throughout the revised equations.

NCR Number 2 of 17 Dated January 7, 2010

Finding: Page 19, Step 1 of the procedure for measuring standing dead wood reads "Standing dead trees shall be measured using the same techniques and criteria used for measuring living trees.

Stumps must be inventoried as if they are very short standing dead trees." The techniques used for measuring live trees require measurement of the diameter at breast height(1.3m). Stumps usually are shorter than 1.3m, so measurements and models (such as allometric equations or biomass expansion factors) based on dbh are not applicable to stumps.

Proponent Response on January 24, 2010: *This has been move to Section 4.3.3.*

The methodology states that "Stumps must be inventoried as if they are very short standing dead trees". This is then expanded upon by decomposition class 2: Tree with signs of decomposition (other than loss of leaves) including loss of twigs, branches, or crown.

The explanation of how to measure stumps, without using dbh is given as follows:

"The estimate of biomass should be limited to the main trunk (bole) of the tree, in which case the biomass is calculated converting volume to biomass using the appropriate dead wood density class. Volume is estimated as either the volume of a cone if the top diameter cannot be measured (and is assumed to be zero), or a cylinder if the top diameter can be measured directly or by using an instrument such as a relascope or laser inventory instrument. Height/length is determined as either the total height in case of a standing bole or the height at the base of the crown if the crown is persistent"
Approaches for basal diameter only, and basal diameter plus top diameter are now provided:

$$B_{SDWl,sp,i,t} = \frac{1}{3} * \pi * \left(\frac{BDia_{SDWl,sp,i,t}}{200} \right)^2 * H_{SDWl,sp,i,t} * D_{DWdc}$$

$$B_{SDWl,sp,i,t} = \frac{BDia_{SDWl,sp,i,t} + TD_{SDWl,sp,i,t}}{200} * H_{SDWl,sp,i,t} * D_{DWdc}$$

Auditor Response: Appropriate methods for estimating stump biomass have been provided.

NCR Number 3 of 17 Dated January 7, 2010

Finding: More information is required regarding the stratification of the reference area. On page 32, The parameter D%planned,i,t is calculated on a per-strata basis. This parameter is based on the average percent of logged area in stratum i across some number of land parcels. On page 31, the parameter D%planned, I is multiplied by deltaCbsl,i the net loss of carbon in the baseline scenario in stratum i. For this calculation to be appropriate, all land inventoried to estimate deltaCbsl,i must have already been logged. However, the equation for estimating D%planned,I,t on page 32 implies that there are parts of the reference area that fall into stratum i but have not yet been logged. The methodology must explain how the reference area is stratified and how that stratification is applied to estimating the loss of carbon due to logging under the baseline.
Proponent Response on January 24, 2010: *The methodology developers have amended the equations surrounding the parameter to calculate D%planned. An additional equation has been provided to calculate the area logged per stratum has been given as:*

$$A_{i,t} = D\%_{i,t} \times A_{TOT,i}$$

The equation works per stratum and provides information on both the logged and total area. This therefore accounts for parts of the reference area that fall into stratum i, but have not yet been logged.
Initial Auditor Response: If the baseline is being monitored for regrowth, the revised equation on

page 17 has potential problems. The carbon stock change captured in $\Delta C_{REL,\,l}$, [subscript t needed] and $\Delta C_{wood\text{-}exist,\,l,\,t}$ are both estimated as a difference in carbon stocks. If a portion of a stratum has been relogged, presumably some plots in that stratum fall into relogged areas and other plots fall outside the relogged areas. The methodology does not separate plots in portions of a stratum that have been relogged from those in areas of the stratum that have not been relogged, so 2 problems occur:

1) $\Delta C_{REL,\,l}$, is representative of the change in carbon stocks in the entire stratum, not only those portions that have been relogged, so it is not appropriate to multiply it by $A_{i,t}$

2) $\Delta C_{REL,\,l}$, and $\Delta C_{wood\text{-}exist,l,t}$ are both based on differences between carbon stocks obtained from the same plots and are at risk of double counting the effects of relogging

Second Proponent Response on February 22, 2010:

Eq 3

$$\Delta C_{REL,i,t} = A_{REL,i,t} \times (C_{harvest,i} + (C_{damage,i} - C_{DW,i}) - C_{WP,i}) \times 44/12$$

Dw is tracked only in case of relogging. Dw in the baseline pre-relogging is assumed to be the same as in the with-project scenario and not accounted for. See pools table: "Accounting for deadwood as zero in the project scenario is conservative. Accounting for dead wood occurring prior to relogging as zero is conservative."

$C_{DW,i}$ only tracked for year of relogging; continued existence of dw in baseline implies emissions; these are not tracked but this is conservative.

On regrowth, the following text is added:

"If regrowth occurs in the baseline scenario this is assumed to be small compared to regrowth in the with-project scenario. Furthermore, regrowth in the relogged residual stand is assumed to be smaller than regrowth in the pre-relogged residual stand. Therefore, as a conservative approach, the regrowth in the baseline case is estimated as the regrowth of the pre-relogged residual forest applied to the entire area of the stratum, despite any relogging in that stratum."

Eq 21

$$\Delta C_{woody-exist,i,t} = A_{i,t} \times \sum_{j=1}^{S} \Delta C_{woody-exist,\,j,i,t}$$

Second Auditor Response:

The assumption that regrowth in the relogged residual stand is smaller than regrowth in the pre-relogged residual stand is valid given the applicability conditions stated in the methodology(i.e. that the forest is unlikely to revert to normal growth patterns because of the presence of vines and climbers). Consequently, any errors that result from applying regrowth estimates of non-relogged portions of the strata are indeed likely to be conservative. The concern of point 2, above, however, has not been adequately addressed. In the case that a reference area is used for estimating $\Delta C_{REL,\,l}$, and $\Delta C_{wood\text{-}exist,l,t,}$, as in section 4.3.3, both $\Delta C_{REL,\,l}$, and $\Delta C_{wood\text{-}exist,l,t}$, (which has recently been renamed to $\Delta C_{tree\text{-}exist,l,t}$) are based the methods outlined in section 5.2.2. The methodology does not differentiate between plats falling in parts of strata that have been relogged and parts of strata that are not relogged. Based on the equations provided, it appears as though both parameters will be sensitive to both regrowth and relogging, since they are both based on differences in onsite biomass at different times. Equation 21 may very well result in a negative number, indicating that biomass has been lost from the site. That same loss appears to be accounted for in equation 10.

NCR Number 4 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 1 of 13 for December 14, 2009. The newly added language is ambiguous as to the meaning of the words 'similar' and 'comparable.' The methodology should provide guidelines regarding how close two estimates of carbon stocks must be to be considered 'comparable,' and should specify which pools must be considered in comparing those stocks. For the two areas to be similar, the sizes of individual pools should be similar, not just the total carbon stocks (a forest with most of its carbon in dead wood will have carbon dynamics that are very different from a forest with similar overall carbon stocks, but most of its carbon in live wood. Similarly, forests with similar overall carbon stocks but very different stocking can vary substantially in their carbon dynamics).

Proponent Response on January 24, 2010: *The instruction now reads (first of 3 bullet points): "Supporting comparable quantities of carbon stocks in above-ground woody biomass and deadwood before relogging and comparable predicted yields of commercial timber (all +/-20%). If project proponents conservatively choose not to account for deadwood in the with-project scenario, similarity for the dead wood carbon pools between the Reference Area and the Project Area does not need to be demonstrated. In case of a larger difference than 20%, the project proponent must demonstrate that a larger or smaller carbon stock in above-ground woody biomass and/or dead wood in the Reference Area compared to the Project Area gives a relatively high value for the post-relogging carbon stock in above ground biomass and thus a conservative result for the net GHG benefits of the project (e.g. if biomass in forest in the Reference Area is greater than in the Project Area and relogging rates will be the same);"*

Thus, reference to two pools (a/g biomass and dead wood) and a 20% threshold are included and instructions on how to deal with differences beyond 20%.

Auditor Response: The changes adequately address the findings. The methodology now requires that the reference area and project area be compared in terms of both deadwood and live biomass, and provides objective standards for making that comparison.

NCR Number 5 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 1 of 13 for December 14, 2009. Bullet point three still contains the word 'or,' even though all four criteria are now required. The methodology developer must clarify this word choice.

Proponent Response on January 24, 2010*: NCR 1 of 12 1409 states: "In addition, the reference area should be shown to have similar carbon stocks to the project area prior to the first round of logging." We feel that since the methodology only applies to areas that have been logged over, biomass similarity before first-time logging is not relevant. The relevant comparison should be on biomass after logging and before relogging. Therefore, we eliminated the first bullet point. An additional argument is that if the original first bullet point would remain, many projects would not be eligible since they may not have sufficient information on biomass stocks in a/b biomass and dead wood in primary forest in the Project Area and the Reference Area, rendering the methodology's scope fairly limited.*

Now 3 bullet points that must all be complied with.
Similarity of the Reference Area to the Project Area can be demonstrated through meeting the following conditions, based on own measurements, literature recourses, datasets or a combination of these:

- *Supporting … will be the same);* ***and***
- *Having been subjected to the same management regime for first-round logging;* ***and***
- *Having comparable legal rights and harvesting rights.*

Auditor Response: The changes adequately address the finding for January 7. The word 'or' has been replaced with 'and.' We agree that the removal of the stipulation that biomass be similar prior to to first round logging is reasonable.

NCR Number 6 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 1 of 13 for December 14, 2009. The management within the selected reference area must not be affected by its selection as a reference area. No criteria are specified to determine whether the management in a reference area is affected by its selection as a reference area. Although some objective criteria are specified in the methodology for selecting a reference area, the selection of a reference area from many possible reference areas is relatively subjective. The methodology developer must specify verifiable criteria to determine whether a selected reference area is being affected by its selection as a reference area. Alternatively, the methodology developer must specify the selection of a sample of reference areas and modify estimation procedures according to sample measurements rather than measurements made on a single reference area.

Proponent Response on January 24, 2010: *We have included both a criterion and the possibility to use a sample of various reference areas.*

The methodology is amended as follows.

"Justification must be provided in the PD that the selected Reference Area is representative for the Project Area in the baseline scenario, and that the management of the Reference Area is not affected by its selection as such. The latter can be based on documented evidence that the planning of relogging occurred prior to the assignment as Reference Area by the IFM project proponent. Alternatively, a sample of Reference Areas can be taken."

The additional instruction with the equation for $\Delta C_{REL,i}$ now reads:

"In case a sample of various Reference Areas is taken, the equation below provides for the calculations to be performed for each stratum i in these Reference Areas. The outcome of the equation must be the weighted average across similar strata in all Reference Areas, where the weighing factor is the total area of stratum i in each of the Reference Areas."

Auditor Response: The methodology developers have strengthened the criteria for ensuring that the management in a reference area is not affected by its selection as a reference area. Additionally, the methodology now provides for using a sample of reference areas. However, no guidelines are given as to the required size of the reference area sample, either in terms of area or in number of discrete land units.

Second Proponent Response on February 22, 2010: In round 3 the following sentence has been added requiring the sample areas together to jointly meet the same criteria as set out for a single Reference Area reading:

"The Reference Areas together must meet the criteria set out by the applicability conditions (minimum size) and those elaborated in this section (similarity to Project Area)."

Auditor Response: The methodology now provides adequate guidelines as to the required size of the reference area sample.

NCR Number 7 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 2 and 13 of 13 for December 14, 2009. The concept of monitoring the growth within the reference area and subtracting carbon accumulated in the reference area from carbon benefits of the project addresses the concern over regrowth of residual trees. However, the methodology should be more explicit about the intensity and frequency of monitoring required in the reference area (i.e. chapter VIII should address both reference area monitoring and project area monitoring explicitly). It is not clear if monitoring of the reference area is to be approached with the same methods, intensity, and frequency as monitoring of the project

area.
Proponent Response on January 24, 2010*: Indeed, the monitoring of the Reference Area is only required if the Reference Area is to provide data on regrowth of the residual stand in the baseline.*

We added the following instruction in Chapter VIII:

"8.2 Monitoring of Regrowth in the Baseline Scenario

When monitoring regrowth in the baseline scenario using a Reference Area, the monitoring plan must provide specific monitoring procedures. These procedures must follow the same approach as provided below for the monitoring of the project scenario. Thus, the monitoring plan is to provide (justifications for) sampling frequency, sample size and field procedures for monitoring regrowth of residual forest in the baseline scenario."
Auditor Response: The revisions adequately address the findings. The methodology now requires a monitoring plan that details sampling frequency, sample size, and field procedures for monitoring the reference area. These procedures are required to follow the same approach as those used for monitoring in the project scenario.

NCR Number 8 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 4 of 13 for December 14, 2009. The addition does not provide an equation for calculating C_BSL. Sections 4.3.1 and 4.3.2 describe an equation for calculating delta C BSL,I and Section 4.3.3 describes an equation for calculating delta CBSL,I,lr. It is assumed that these are combined across strata in some way to calculate the delta C BSL, referenced in section 7, but the equation or method for doing so is still not provided.
Proponent Response on January 24, 2010*: We acknowledge that the equations leading up to the calculation of baseline carbon stocks was confusing, and have re-worked the logic behind this section.*

However, we have used an approach in which, although a general equation for ΔC_{BSL} is given, to calculate the baseline carbon stocks there are 2 parameters involved: $C_{BSLpre,i}$ and $C_{BSLpost,i}$. These are not the same thing, and therefore there is no overall equation for C_{BSL}. In contrast, for $C_{BSLpre,i}$ and $C_{BSLpost,I}$ each step to obtain these values, along with all parameters have been explained in Section 4.3.
Auditor Response: The methodology now describes the calculation of ΔC_{BSL} in section 4.3. The revised method is appropriate.

NCR Number 9 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 5 of 13 for December 14, 2009. The VCS 2007.1 states the following about uncertainty (section 6.5.2, p 20, last paragraph):

"If applicable, the project proponent shall select or develop GHG emissions or removal factors that...take account of the quantification uncertainty and are calculated in a manner intended to yield accurate and reproducible results"

The VCS standard explicitly calls for quantification of uncertainty and consideration of that uncertainty in calculation of GHG removal factors. The methodology, as written, only provides guidelines intended to minimize uncertainty. It does not provide methods to quantify uncertainty or to consider the degree of uncertainty in calculation of VCUs. The methodology developers can look to the proposed IFM methodology "Estimating Greenhouse Gas Emission Reductions From Planned Degradation" developed by Carbon Planet, or to the VCS approved Climate Action Reserve Forest

Project Protocol for examples of methodologies that incorporate quantification of uncertainty in determining overall project carbon benefits.

Proponent Response on January 24, 2010: *We propose to follow the approach provided in the Uncertainty Module (X-UNC) developed by AD Partners and currently being reviewed by TuvSud. This document is provided separately. This module is developed for REDD purposes but is very well applicable to IFM. When adopting the approach in the module, we will not use it as a module but incorporate it in the methodology. The following amendments will be needed:*

- *REDD replaced with IFM*
- *Remove all references to 'module' and amend text*
- *Incorporate variables used in this methodology*

Helpful to many IFM projects will be the following:
"Where an uncertainty value is not known or cannot be simply calculated, then a project must justify that it is using an indisputably conservative number and an uncertainty of 0% may be used for this component." and
"Alternatively, (indisputably) conservative estimates can also be used instead of uncertainties, provided that they are based on verifiable literature sources or expert judgment. In this case the uncertainty is assumed to be zero. However, this module provides a procedure to combine uncertainty information and conservative estimates resulting in an overall ex-post project uncertainty."

Auditor Response: Additional guidance was sought from VCS regarding the necessity of quantification of uncertainty and application of confidence based deductions to ensure conservative estimates of project GHG benefits. It was determined that confidence deductions are indeed conservative to the estimation of project GHG benefits. The proposed uncertainty module had not yet been incorporated into the methodology, so NIR 1 of 1 for February 1, 2010 was issued.

NCR Number 10 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 7 of 13 for December 14, 2009. The core issues here are whether the carbon stocks in vines and climbers are significant, and whether the CDM executive board decision referenced in the methodology and in the CDM approved tool "Estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of an A/R CDM project activity" is relevant to the methodology as a whole.

Clearly, there will be a decrease in non-tree biomass if vines and climbers are removed. If the carbon stocks in vines and climbers are insignificant (combined neglected pools are less than 5% of the total project increase in carbon stock) neglecting them is not a problem. However, even in this case, the language of the applicability condition is contradictory. The change in non-tree biomass is not assumed to be zero, it is simply less than the minimum required by VCS (a change that could be conservatively assumed to be zero would have to be an increase in non-tree biomass in the project scenario). An assumption that the change is zero without estimating the biomass in vines and climbers is not conservative. As written, the methodology has no language describing an assessment of the significance of vine/climber carbon removed.
If carbon in vines and climbers is significant, the methodology developers argue that it still does not need to be accounted for, citing footnote 1 of the above mentioned tool, which states:

In accordance with the guidance provided by the Executive Board at its forty-second meeting, GHG emissions from removal of herbaceous vegetation may be considered as insignificant and hence can be neglected in A/R baseline and monitoring methodologies and tools (refer to paragraph 35 of the meeting report).

Paragraph 35 of the meeting report states:

The Board clarified the guidance on accounting GHG emissions in A/R CDM project activities from the following sources: (i) fertilizer application, (ii) removal of herbaceous vegetation, and (iii) transportation; and agreed that emissions from these sources may be considered as insignificant and hence can be neglected in A/R baseline and monitoring methodologies and tools. The Board further requested the secretariat to revise all affected approved A/R CDM baseline and monitoring methodologies and tools, in order to apply the above-mentioned guidance, and make these methodologies available on 17 October 2008, after agreement by the chairs of the A/R WG and the Board.

It can be noted, however, that VCS requires accounting of GHG emissions that result from fertilizer application. Also, the methodology developers choose to account for avoided emissions from transportation of logs that would have been harvested in the baseline. Consequently, paragraph 35 above has not been taken as applicable guidance for the significance of GHG emissions for the methodology as a whole. The project revolves around removal of vines and climbers that would, in the absence of the project, significantly inhibit regrowth. This suggests that the biomass of vines and climbers is relatively large. The removal of this biomass should either be accounted for, or be shown to be insignificant according to the VCS standard.

Further, the applicability condition "No direct human-induced activities leading to the loss of carbon stocks…shall occur in the project case within the project boundary" is similarly contradictory, as the project case includes liberation thinning.

Proponent Response on January 24, 2010:
Herbaceous vegetation

Climber cutting may indeed be a major activity in project implementation, but this does not imply that carbon stocks in climbers and vines are relatively large. In the case of logged-over dipterocarp forest in Sabah, Malaysia, estimates of carbon stocks in these plants after destructive sampling are in the order of 1.1 t C/ha.

This is acknowledged by the VCS and therefore we have removed the reference to the EB clarification and now follow additional guidance provided by the VCS. This guidance has not been formally published by the VCS yet, but validators can obtain this information by contacting VCS directly. The additional guidance on insignificant pools and emissions sources includes the removal of herbaceous vegetation as well as fertilizer use and some more.
Applicability conditions

The applicability condition stating that changes in carbon stocks of above- and below-ground biomass of non-tree vegetation, as well as insignificant changes in carbon stocks of above and below ground biomass of tree vegetation, may be conservatively assumed to be zero for all strata in the baseline scenario, is removed as it is no applicability condition and this subject is covered with the guidance of the VCS on insignificant pools and emissions sources.

The applicability condition that no direct human-induced activities leading to loss of carbon stocks (such as biomass burning, harvesting, selective logging, fuel gathering, removal of litter, or removal of deadwood) shall occur in the project case within the project boundary, is amended to include only biomass burning, fuel gathering, removal of litter and removal of dead wood. Through monitoring of carbon stocks in the project scenario losses of carbon stocks due to harvesting are captured. The methodology therefore now applies to cases where, if relogging occurs in the baseline, it is

unsustainable logging. Unsustainable is defined as not adhering to norms that ensure a natural regrowth of the residual forest to allow for sustainable timber yields. The project case may therefore allow harvesting, as long as it ensures such sustainability. An applicability condition covering this has been added:

- *"If harvesting occurs in the with-project scenario, harvesting regimes must adhere to norms that allow for sustainable timber yields, e.g. based on maximum allowable cut determinations."*

While harvesting is allowed, this attenuates the non-permanence risk represented by unsustainable harvesting.
In addition, accounting for dead wood and wood products in the project case and monitoring of dead wood and wood products is also included in the methodology. Not accounting for dead wood and wood products in the project scenario is conservative.
Auditor Response: The response referenced unpublished guidance from VCS. The proponents were asked to make this guidance available for review. The following information was received from Naomi Swickard, the AFOLU Program Coordinator at the Voluntary Carbon Standard Association:

Dear Kyle,

Igino Emmer has contacted us regarding the IFM methodology you are validating and the treatment of herbaceous vegetation. The VCSA is in the process of approving and releasing a program update to cover several changes to the Tool for AFOLU methodological issues, including a change to the requirement for insignificant emissions and pools (Step 0.2):

> *Certain GHG sources may be considered "insignificant" and do not have to be accounted for if together such omitted decreases in carbon pools and increases in GHG emissions amount to less than 5% of the total CO2-eq benefits generated by the project5. (footnote: 5 The following CDM EB tool can be used to test the significance of emissions sources: http://cdm.unfccc.int/EB/031/eb31_repan16.pdf).*

The CDM has recently deemed a number of emissions sources and pools as a priori insignificant for CDM A/R projects. The VCSA has determined that certain emissions sources and carbon pools may be considered a priori insignificant in ARR, IFM or REDD projects. This determination is based on expert judgement, precedent from projects, literature, and taking into account likely situations in which project activities are implemented. When making this determination, if preliminary assessments, based on IPCC default values and some variation around those values, suggest that emissions sources or carbon pools are (individually) well below 5%, an additional effort was taken to identify situations that would falsify the assumption that the increase in emissions sources or reduction of carbon pools is not significant. This resulted in a list of emissions sources and carbon pools which we are working to have approved as deemed a priori insignificant for ARR, IFM or REDD projects. Included in the list for IFM projects is the removal of herbaceous vegetation.

The VCSA is still finalizing this decision; the Steering Committee will need to sign off and the update will then be released in due course. If you need further information (including on other sources/pools deemed insignificant), please feel free contact me.

Best regards,

Naomi Swickard

AFOLU Program Coordinator

Voluntary Carbon Standard Association

T: 202 296 2460

M: 202 423 8552

Based on this guidance, the methodology developer was asked to revise the applicability conditions to include the definition of "significance" provided by VCS for herbaceous vegetation.

NCR Number 11 of 17 Dated January 7, 2010

Finding: This finding is in response to NIR 5 of 21 for December 14, 2009. The changes specify the units for harvest volumes as cubic meters, but do not specify how or when harvest volumes should be recorded. The methodology requires the volume of timber harvested in the baseline scenario to estimate the net loss of carbon in the baseline scenario. Timber harvest volumes are recorded many different ways and at different stages during harvest operations. Harvest volumes can be either stumpage or scale, and scale volumes can be at yard or delivery. The methodology developer must define what harvest volume is and it should be quantified under the baseline scenario.
Proponent Response on February 22, 2010: *A paragraph has been added to Section 4.3 reading: 'Harvested volume' or 'volume of timber removed' ($V_{harvest,i,j}$: see Section 4.3.2) is measured as cubic meters removed from the forest and as reported in available information mostly based on for instance truck loads of timber that have been transported off-site. Most often timber is measured at the landing before loading and freight bills accompany the timber to the place where it is transported. Volumes are normally measured by authorities such as the Forest Department, or as a minimum inspected by such authorities, after which volumes of timber are reported. Volumes are normally calculated on the basis of diameter measurement on both sides of the log with calipers and the length of the log, and specified per species."*

Auditor Response:
More detail has been provided regarding the intended methods for recording harvest volume. The level of detail provided is adequate.

NCR Number 12 of 17 Dated January 7, 2010

Finding: This finding is in response to NIR 8 of 21 for December 14, 2009. The added text explains how change in biomass stocks is estimated. However, it is placed at the end of the section describing the BEF method, while changes in carbon stock can be calculated with either the BEF or allometric equation method. Additionally, an equation similar to that shown for dead wood in section 5.3, would resolve the issue more clearly than the added text. The language describing the parameter C¬AB_tree,l,j,l,sp,t still refers to a sum of changes, rather than stocks, even though the changes are not determined until the procedure described in the new text has been completed. The methodology developer must completely, clearly and accurately define all equations in all relevant sections.
Proponent Response on January 24, 2010: *$C_{AB\_tree,l,j,i,sp,t}$ is now defined as carbon stock in above-ground biomass of tree l of species j in plot sp in stratum i at year t , as in the ARAMs referred to. Bookkeeping has been completed to be in line with these ARAMs.*

The previously added text

"The above procedure (step 1 through to 5) is conducted at two points in time with one or more years in between. The most recent measurement minus the earlier measurement is the change in carbon stocks per hectare for that stratum during that period. Dividing that value by the number of years between the two measurements results in a value of changes in carbon stocks of above ground biomass in stratum i at time t ***per year*** *($\Delta C_{AGB\_tree,i,t}$ as tC ha^{-1} yr^{-1} for stratum i) during the period in between the two measurements. This parameter value can be inserted in the formula in the beginning of this section 5.2.1."*
has been removed.
Auditor Response: The methodology now clearly defines the equations used to estimate change in biomass stocks.

NCR Number 13 of 17 Dated January 7, 2010

Finding: This finding is in response to NIR 11 of 21 for December 14, 2009. The developer's response has eliminated the use of a yield table for determining expected dbh, but the same change has not been made for tree height. No criteria has been provided for selecting an appropriate growth model. The change must also be applied to tree height or criteria must be provided for selecting an appropriate growth model.
Proponent Response on January 24, 2010: *We have changed the equation as follows:*

$f_j(X, Y, \ldots)$
(Allometric equation for species j linking measured tree dimension variables (e.g. diameter at breast height (DBH) and possibly height (H)) to above-ground biomass of living trees)

to allow for more flexibility in selecting appropriate tree dimension measures.

The comments box in the parameter table for DBH and H now reads:
"For ex-ante estimations, tree dimension variables (e.g. diameter at breast height (DBH) and possibly height (H)) should be estimated for tree species j in stratum i, at year t using a growth model based on these tree dimensions."

We have taken the guidance on using allometric equations in ex-ante estimates from AR-ACM0002, where the requested criterion is conservativeness:
"When applying these equations for the ex ante calculation of net anthropogenic GHG removals by sinks, PPs shall provide estimates of the values of those parameters that are not available before the start of the crediting period and commencement of monitoring activities. PPs should retain a conservative approach in making these estimates."

While VCS demands an ex-ante estimate of net GHG benefits, the requirements for such estimates should not be very harsh and the above guidance (in Chapter V and repeated in Section 8.1) ensures conservative outcomes.
Auditor Response: The methodology now includes guidance that a conservative approach should be used in choosing models that estimate ex ante GHG removals. It is recognized that different types of models may be appropriate for different projects, and that a requirement for conservative model choice is sufficient guidance at the methodology level. Further review of model selection will likely be required in validating specific projects.

NCR Number 14 of 17 Dated January 7, 2010

Finding: This finding is in response to NIR 14 of 21 for December 14, 2009. The VCS language that refers to a 5-10 year basis appears on page 6 paragraph 14 of the VCS tool for methodological issues:

14. In the case of IFM project activities, project developers using a project-based approach (rather than a performance/benchmark standard)12 for establishing a baseline shall provide the following information to prove that they meet minimum acceptable standards:
a. A documented history of the operator (e.g., operator shall have 5 to 10 years of management records to show normal historical practices). Common records would include data on timber cruise volumes, inventory levels, harvest levels, etc. on the property13;
b. The legal requirements for forest management and land use in the area, unless verifiable evidence can be provided demonstrating that common practice in the area does not adhere to such requirements; and
c. Proof that their environmental practices equal or exceed those commonly considered a minimum standard among similar landowners in the area.

The 5-10 year time frame appears in the VCS document as part of a parenthetical example (hence the e.g.) and should not be considered appropriate for all projects. The methodology developer should describe what time period is appropriate, considering the identification of long term trends, periodicity in management activities, and periodicity in management planning.
Proponent Response on January 24, 2010: *We propose to use the additionality module (T-ADD) developed for the AD Partners REDD methodology, currently under validation by TuvSud. This module was based on the AR tool and can be easily amended to suit IFM. This tool meets all of the VCS project tests (regulatory surplus, implementation barriers, common practice test) in substance and it is much more elaborate and providing more guidance than the VCS standard text. The module is provided separately – grey highlights indicate amendments for REDD.*

In addition we propose to use Step 1 of A/R Methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" for the selection of the baseline scenario.

The minimum requirement of the VCS re providing a documented history is 5 years of management records. This is the requirement we use in the methodology.
Auditor Response: The proposed methodological tool (T-ADD) indeed provides detailed guidance that is largely relevant to determining additionality for IFM projects. The tool's text is not yet integrated into the methodology, and will require editing to remove components specific to REDD projects.
The T-ADD tool's text frequently refers to a 10 year period before the project start date for assessing historical operational practice. This differs from the 5 year history of management records described in the response to NCR 14 for January 7, 2010. In integrating the additionality tool's concepts into the text of the main methodology document, the methodology developers should justify the choice of the time period required for assessing historical practice. The methodology developers have provided no justification for the time period chosen, apart from "The minimum requirement of the VCS re providing a documented history is 5 years of management records. This is the requirement we use in the methodology." As discussed in NCR 14 of 17 for January 7, 2010, The 5-10 year time frame appears in the VCS tool for methodological issues as part of a parenthetical example (hence the e.g.) and should not be considered appropriate for all projects.
Second Proponent Response on February 22, 2010: *The 1st bullet has been amended as follows:*

- *A documented history of the operator (operator must have 5 years of management records to show logging intensities and normal historical practices). Common records would include data on timber cruise volumes, inventory levels, harvest levels, etc. on the property that demonstrate what the normal practice in the area is. The documented history must also indicate the periodicity in logging operations in the area and in management planning (e.g. interval between two subsequent logging coupes according to management plans (past or*

current) and in reality); and

This ascertains that it is clear what the normal practice is between the last 2 periods of logging activities. On the basis of that it can be verified that for instance intensive logging in the surrounding area is not a coincidental one-off event but rather common practice, but avoids putting a high burden on the project to obtain old records, which is often complicated in developing countries.
Related to the comments regarding the additionality tool for IFM:
In the additionality tool, the 10 years are related to the conditions during time period before the project starts, not to track records. The '10 years' in the VCS Afolu guidance in case of ARR is used in stead of '1989; and in case of REDD to avoid issues with young forest not being discernible from other land use in remote sensing. For IFM there is no '10-years rule' but we have chosen this period 1) because of the opportunity to merge the tools for IFM and REDD at some stage; B) because the 10 years is arbitrary for both IFM and REDD but is a benchmark provided by the VCS.
Auditor Response: The new language specifies that the documented history provided must indicate logging intensities, normal historical practices, periodicity in logging operations, and periodicity in planning activities. Although 5 years of records may not be sufficient to establish these historical practices, the methodology's language now requires that documentation be provided, implying that additional records may be required for some projects at the discretion of a project validator. The changes adequately address the original findings.

NCR Number 15 of 17 Dated January 7, 2010

Finding: This finding is in response to NIR 15 of 21 for December 14, 2009. The extrapolation methods described are likely to lead to bias in estimates of carbon removals. The growth of trees is nonlinear as a function of time. As stands mature, the annual increment in aboveground biomass generally decreases, particularly after canopy closure. Applying a linear extrapolation to changes in carbon stocks is likely to overestimate project carbon benefits. The methodology developer must specify a better model for extrapolation or provided reasonable measures to reduce bias in extrapolation.
Proponent Response on January 24, 2010: *We acknowledge that tree growth is not linear and that a linear model does not capture the growth dynamics of trees if it covers a long time span. However, the methodology requires a maximum time span of 5 years. Moreover, this is not a case of extrapolation but interpolation between 2 known values, for the purpose of obtaining annual results. The maximum amount of credits is always limited by the difference between these 2 points. Therefore, there can be no overestimation that is not compensated by an underestimation. Nonetheless, the text does not belong to the section on stratification nor is it a matter that needs to be dealt with in a baseline methodology, hence it has been removed.*
Auditor Response: The response to the finding states:
"Moreover, this is not a case of extrapolation but interpolation between 2 known values, for the purpose of obtaining annual results. The maximum amount of credits is always limited by the difference between these 2 points. Therefore, there can be no overestimation that is not compensated by an underestimation."
This is in conflict with page 56 of the methodology:
"For intermittent years it is good practice to use extrapolations of trends as they have occurred up till that moment. Monitoring reports can use such extrapolated parameter values for the determination of net emissions by sources and removals resulting from the project."
The methodology developer must clarify the use of extrapolation in issuing monitoring reports, particularly if such reports are to be used for the issuance of carbon credits. The methodology must outline procedures that minimize the risk of overestimating project carbon benefits as a result of applying models.
Second Proponent Response on February 22, 2010: *Additional text mentioning extrapolation in*

Chapter 8 has been removed.
Auditor Response: The removal of extrapolation for issuing monitoring reports adequately addresses this finding.

NCR Number 16 of 17 Dated January 7, 2010

Finding: This finding is in response to NIR 11 of 21 for December 14, 2009. The guidance provided in IPCC GPG LULUCF Section 4.3.3.5.1 assumes the verification of allometric equations from a biome-wide database. The methodology employs this guidance but without regard to the source of the allometric equations being verified. The assumption made in the guidance is critical as it reduces possible prediction error caused inference from one population (a biome) to another (a different biome). The methodology developer must include this assumption or abandon the IPPC guidance for a statistically valid test. Secondly should the methodology developer include this assumption, then appropriate methods for verifying allometric equations not from a biome-wide database must be specified.
Proponent Response on January 24, 2010: *The following text has been added to the methodology in order to include the assumption within the IPCC guidance of applying an allometric equation from a biome-wide database. Also a statistical test is included for cases when an allometric equations is used that is not obtained from a biome-wide database:*

"If default allometric equations are available for conditions that are similar to the project (same vegetation genus; same climate zone; similar forest type), then the equation may be used and considered conservative. Otherwise, it is necessary either to use conservatively assessed values, or to verify the applicability of the equation if mean predicted values are to be used.

When allometric equations developed from a biome-wide database, such as those in Annex 4A.2, Tables 4.A.1and 4.A.2 of GPG LULUCF, or updated in IPCC 2006 Guidelines for AFOLU, are used, allometric equations can be verified by:
• Selecting at least 5 trees covering the range of DBH existing in the project area, and felling and weighing the above-ground biomass to determine the total (wet) weight of the stem and branch components;
• Extracting and immediately weighing 11 sub-samples from each of the wet stem and branch components,12 followed by oven drying at 70ºC to determine dry biomass;
• Determining the total dry weight of each tree from the wet weights and the averaged ratios of wet and dry weights of the stem and branch components.

If the biomass of the harvested trees is within about ±10% of the mean values predicted by the selected default allometric equation, and is not biased—or if biased is wrong on the conservative side (i.e., use of the equation results in an under- rather than over-estimate of project net anthropogenic removals by sinks)—then mean values from the default equation may be used. (IPCC Good Practice Guidance for LULUCF, 2003, section 4.3.3.5.1, under direct approach step 3)

When allometric equations are used that are not developed from a biome-wide database as mentioned above, a one-sided t-test (with alpha =0.05) should be applied to determine whether the biomass predicted by the allometric equation does not exceed the biomass from the harvested trees. To obtain biomass from the harvested trees, the same procedure as described above should be used."

Auditor Response: The methodology now describes adequate methods for verifying allometric equations from both biome-wide databases and other sources. Statistical tests are now required for verifying equations that are not derived from a biome-wide database.

NCR Number 17 of 17 Dated January 7, 2010

Finding: This finding is in response to NCR 10 of 13 for December 14, 2009. The methodology developer must be consistent in notation throughout the methodology.

-On page 18, the equation includes the parameter Cwp, while the table below defines Cwp,i. The notation is inconsistent.
-For the parameter D (page 24), the description reads "Basic density of the harvested wood in the baseline scenario in stratum i," but a subscript i is not used as in the rest of the document (i.e we see D, not D¬i).
-On page 46 the parameter Aj is defined as the area of stratum i, and when used in the equation for Ctree,i,t is referenced with the subscript i, not j. The subscript j has been used elsewhere in the document to refer to species, while i has been used for strata. Subscripts should be used consistently for clarity.

-On page 32, the parameter Yrspn lacks a stratum index, even though the description lists this as a stratum specific parameter.
CAB_tree,l,j,l,sp,y (page 45) repeats the subscript l when i was probably intended.
-Similarly, on page 43, Ebiomassloss is included within a summation, but not subscripted with t. This implies that a constant that represents emissions due to site preparation for project activities is deducted from each years' estimate of changes in carbon stocks. This is almost certainly not what the methodology developers intend.
-Additionally, the following parameters appear in equations but are not defined:
Pn* (page 32) is not defined.
T* (page 43) is not defined.
Cleakage is not defined (pg. 52). This must be calculated from the individual leakage components described in section VI.

Proponent Response on January 24, 2010: *The methodology developer acknowledges the NCR, and has worked through the entire methodology to ensure consistency.*

For the particular findings:

1. The equation and table both refer to $\Delta C_{WPt,}$
2. Parameter D has been consistent throughout as Dj, referring to the basic wood density of species j.
3. Parameter Aj has been corrected to Ai
4. The description for Yrspn has been made consistent with the parameter
5. Subscript l has been corrected to i
6. A time component has been added to Ebiomassloss
7. Pn has been added to the table and defined as the land parcels in the proxy area
8. T has been defined in the table as the number of years between times t and t-1
8(sic). Cleakage is actually ΔCleakage as defined as "Sum of the carbon stock changes and greenhouse gas emissions due to leakage up to time t "

Auditor Response: The document is now consistent in its use of notation.

NCR Number 1 of 2 Dated February 1, 2010

Finding: The methodology must completely address all public comments.
Proponent Response on February 22, 2010: Included in supplementary table.
Auditor Response: Included in supplementary table.

NCR Number 2 of 2 Dated February 1, 2010

Finding: In the equation for the number of VCUs to be issued (page 51). ΔC_{IFM} represents the

cumulative GHG emission reductions from the IFM project activity since the beginning of the project. Presumably carbon credits are to be issued periodically (not just at the end of the project lifetime). The equation on page 51 for VCUs issued must be corrected to avoid double counting of credits that have been previously issued.

Proponent Response on February 22, 2010 *The methodology has been updated with Eq 50:*

$$VCU_t = \left(\Delta C_{IFM,t2} - \Delta C_{IFM,t1}\right) \times \left(\frac{100 - C_{IFM\_ERROR}}{100}\right) - Bufferwithholding$$

Auditor Response:

The revised equation eliminates the risk of double counting by taking the difference in net GHG emission reductions from IFM project activities between years t_1 and t_2, rather than the difference since the beginning of the project.

New Information Requests:

NIR Number 1 of 21 Dated December 14, 2009

Finding: The terms 'harvesting levels' and 'logging rates' are unclear (they sound very similar). The methodology developer must clearly and explicitly define these terms.

Proponent Response on December 28, 2009: *We agree with the above confusion, and have clarified, by using only the term 'harvesting levels'. This is further defined as the volume of timber removed, in cubic meters.*

Auditor Response: The changes adequately address the finding. The confusing terms have been clarified by revised language.

NIR Number 2 of 21 Dated December 14, 2009

Finding: The term 'collateral damage' is ambiguous and undefined. The methodology developer must clearly and explicitly define what constitutes 'collateral damage.'

Proponent Response on December 28, 2009: *The methodology developer has re-defined 'collateral damage' as 'damage to the residual stand, believing that this is less ambiguous and clearly indicates what is being referred to.*

Auditor Response: The changes adequately address the finding. The confusing terms have been clarified by revised language.

NIR Number 3 of 21 Dated December 14, 2009

Finding: The carbon pool in dead wood is excluded by an applicability condition. The applicability condition states that there are less carbon stocks in dead wood under the baseline than under the project scenario. Inherent to the project scenario is the protection of logged-over forest from further logging. The protection of forest from logging implies that under the baseline scenario the forest would be logged further. Logging operations produce slash (discarded and often unmerchantable woody material) which is typically managed one of three ways: redistributed to the harvest area, left to reside in piles or burned (either onsite or offsite). The applicability condition excludes the first two methods for managing slash since these methods would recruit significantly to the dead wood pool relative to the project scenario. Hence the only alternative to manage slash is burning. Given the applicability condition, slash must be accounted under the baseline. It is unclear how slash is accounted under the baseline, whether in the calculation of carbon stock in harvested timber or not. The methodology developer must clearly define how slash is accounted in the

baseline.

Proponent Response on December 28, 2009*: Similar to NCR 8, the methodology developer has changed the accounting of the deadwood pool from being 'optional' to 'yes', and has included a methodology to account for standing dead wood and lying dead wood, in both the baseline and project scenarios.*

In addition, biomass burning has been added to the relevant applicability condition.

Auditor Response: The changes adequately address the finding. Appropriate methods have been added for accounting for slash, which is no longer optional. Biomass burning has been excluded from project activities as an applicability condition.

NIR Number 4 of 21 Dated December 14, 2009

Finding: Rarely is logging is uniform across the landscape. Since the reference area is used to estimate a percentage of area that is logged, it must be of similar size to the project area to avoid bias induced by logging patterns at the landscape scale. This issue is partially addressed on page 31, however not in the context of a similarity criterion. The methodology developer must include criteria for demonstrating similarity of the reference area to the project area with respect to size.

Proponent Response on December 28, 2009: *We believe that non-uniform logging across the landscape cannot be solved by taking a reference area with the same size as the project area. The similar size does not guarantee that the non-heterogeneity is levelled-out. We think that we have addressed this issue by expressing the harvesting levels as an average value per hectare per stratum and applying that to the strata in the project area. However, to accommodate the request of SCS, a applicability condition has been inserted that reads:*

"A reference area of similar or a larger size (75% of the project area or more; no upper limit as long as the similarity criteria are meet) for which similarity with the project area can be demonstrated using criteria outlined in this methodology, and for which it can be demonstrated that the management is not affected by its selection as a reference area, may be used to derive relevant parameter values for the baseline scenario"

Auditor Response: A minimum reference area size has been specified that ensures the reference area will be comparable in size to the project area. Further concerns related to assuring the reference area is representative of assumed conditions in the project area under the baseline scenario are discussed in NCR 1 of 13 for December 14, 2009 and NCR 6 of 17 for January 7, 2010.

NIR Number 5 of 21 Dated December 14, 2009

Finding: The methodology requires the volume of timber harvested in the baseline scenario to estimate the net loss of carbon in the baseline scenario. Timber harvest volumes are recorded many different ways and at different stages during harvest operations. Harvest volumes can be either stumpage or scale, and scale volumes can be at yard or delivery. The methodology developer must define what harvest volume is and it should be quantified under the baseline scenario.

Proponent Response on December 28, 2009: *This has been altered throughout the methodology. Harvesting levels have now been defined as timber removed in m^3. See also NCR 1.*

Auditor Response: The changes do not adequately address the findings. The changes specify the units for harvest volumes as cubic meters, but do not specify how or when harvest volumes should be recorded.

NCR 11 of 17 for January 7, 2010 was issued in response.

NIR Number 6 of 21 Dated December 14, 2009

Finding: Emissions due to the extraction of timber are calculated under the baseline scenario. The baseline scenario is counter factual so actual fuel usage cannot not observed. The methodology

developer must clearly explain how the parameters inherent to the calculation of emissions are estimated under the baseline scenario.
Proponent Response on December 28, 2009: *The main parameter required to determine the emissions due to the extraction of timber in the baseline is the harvested volume that would have been removed. In section 4.3 the methodology provides two ways of determining that value: with or without a reference area. The parameter value determined through that process is the one feeding into section 4.4.2 where the emissions due to the extraction of timber in the baseline are determined. This has now been explained in section 4.4.2 in more detail.*
Auditor Response: The changes adequately address the finding. The document is now clearer about how emissions that result from the extraction of timber are calculated from the baseline estimates of harvested timber volume.

NIR Number 7 of 21 Dated December 14, 2009

Finding: The equation for estimating project net greenhouse gas emission and removals by sinks due to the project activity (page 32) may result in double counting carbon stocks. The equation, as written, represents cumulative net greenhouse gas emissions and removals since the start of the project, not the emissions and removals since the last time period (which is assumed to be a monitoring period for which VCUs may be issued). The methodology developer should clarify whether this equation is indeed accurate for calculating the number of VCUs to be issued. If the equation is accurate, then the methodology developer must further specify how annual VCUs are calculated.
Proponent Response on December 28, 2009: This NIR was not directly responded to.
Auditor Response: NCR 2 of 2 for Feb 1, 2010 was issued in response.

NIR Number 8 of 21 Dated December 14, 2009

Finding: The table in Step 4 indicates that the first parameter is a sum of changes in above ground biomass. As written, the equation in Step 4 gives an estimate of above ground carbon stock, not an estimate of the change in carbon stock as the table indicates. The methodology developer must clarify the calculations for Step 4.
Proponent Response on December 28, 2009: *An additional paragraph has been added to section 5.2.1 reading:*

"The above procedure (step 1 through to 5) is conducted at two points in time with one or more years in between. The most recent measurement minus the earlier measurement is the change in carbon stocks per hectare for that stratum during that period. Dividing that value by the number of years between the two measurements results in a value of changes in carbon stocks of above ground biomass in stratum i at time t ***per year*** *($\Delta C_{AGB\_tree,i,t}$ as tC ha^{-1} yr^{-1} for stratum i) during the period in between the two measurements. This parameter value can be inserted in the formula in the beginning of this section 5.2.1."*
Auditor Response: The changes partially address the findings. The added text explains how change in biomass stocks is estimated. However, it is placed at the end of the section describing the BEF method, while changes in carbon stock can be calculated with either the BEF or allometric equation method. Additionally, an equation similar to that shown for dead wood in section 5.3, would resolve the issue more clearly than the added text. The language describing the parameter C-AB_tree,l,j,l,sp,t still refers to a sum of changes, rather than stocks, even though the changes are not determined until the procedure described in the new text has been completed.

NCR 12 of 17 for January 7, 2010 was issued in response.

NIR Number 9 of 21 Dated December 14, 2009

Finding: The methodology does not directly describe the calculation of VCUs to be issued. If the equation on page 40 is meant to be used to calculate the number of VCUs to be issued, it should use language that specifically states this.

Proponent Response on December 28, 2009: *The methodology developer has inserted a statement on page 40 directly relating 'total carbon benefits' to VCUs. The title of the table on page 41 has been changed to clarify that this refers to the calculating of total VCUs.*

Auditor Response: The changes adequately address the findings. The equation intended to be used to calculate the number of VCUs issued is now clear.

NIR Number 10 of 21 Dated December 14, 2009

Finding: The methodology developer must clarify how increasing the BEF 30% for trees grown in open areas results in conservative estimates of carbon sequestration or provide a reference that shows it is appropriate.

Proponent Response on December 28, 2009: *The text has been used in CDM approved methodology AR-AM0005 without any reference, but to strengthen the methodology in response to this NIR, an explanation has been added to the methodology by inserting a footnote reading:*

"Applying a 30% increase to the BEF for solitary trees in severely logged over forest when calculating regrowth after logging in the baseline is leading to conservative estimates of carbon benefits of the project because it reduces net emissions in the baseline. In the project case less incidences of solitary trees will occur because the canopy will remain intact to a larger degree in comparison to the baseline."

Auditor Response: The changes adequately address the findings. It is clear that increasing the BEF for solitary trees is likely to result in conservative estimates of project carbon benefits.

NIR Number 11 of 21 Dated December 14, 2009

Finding: The allometric equation for tree species are verified using a sample and an arbitrary test of +/- 10% of the predicted values. The methodology developer must justify how this procedure and test infers that allometric equations are unbiased.

Proponent Response on December 28, 2009: *In the IPCC Good Practice Guidance for LULUCF it is stated that it is good practice to verify generic allometric equations in the following way: "…verify the equation by destructively harvesting, within the project area but outside the sample plots, a few trees of different sizes and estimate their biomass and then compare against a selected equation. If the biomass estimated from the harvested trees is within about +/- 10% of that predicted by the equation, then it can be assumed that the selected equation is suitable for the project." (section 4.3.3.5.1, under direct approach step 3). Document attached under title 'IPCC GPG LULUCF Chp4_3_Projects'*

Auditor Response: The response does not adequately address the findings. The guidance provided in IPCC GPG LULUCF Section 4.3.3.5.1 assumes the verification of allometric equations from a biome-wide database, but the methodology employs this guidance but without regard to the source of the allometric equations being verified.

NCR 16 of 17 for January 7, 2010 was issued in response.

NIR Number 12 of 21 Dated December 14, 2009

Finding: The methodology allows for a growth model or yield table to give the expected tree

dimensions as a function of tree age. The methodology developer must provide criteria by which growth models or yield tables are selected. The methodology developer must also describe how yield tables give expected tree dimensions.
Proponent Response on December 28, 2009: *Changes have been made to the methodology and references to yield tables on the basis of age have been removed.*
Auditor Response: The developer's response has eliminated the use of a yield table for determining expected dbh, but the same change has not been made for tree height. No criteria has been provided for selecting an appropriate growth model.

NCR 13 of 17 for January 7, 2010 was issued in response.

NIR Number 13 of 21 Dated December 14, 2009

Finding: The term 'significant' as used here is ambiguous and potentially subjective. The methodology developer must provide guidelines for determining significant uncertainty.
Proponent Response on December 28, 2009: *There are a couple of reasons why we feel reluctant to make changes to the methodology here, because:*

1. *The text of section IX has been copied verbatim from various approved CDM A/R methodologies;*
2. *Significant/insignificant in terms of emissions is defined in chapter III, section 4;*
3. *Chapter VIII (Monitoring) requires the monitoring plan that a specific project will elaborate, to provide QA/QC SOPs. In addition, the methodology in this chapter requires that "all measurements should be conducted according to relevant standards"; "if different values for a parameter are equally plausible, a value that does not lead to over-estimation of net anthropogenic GHG removals by sinks must be selected"; "Standard operating procedures (SOPs) and quality control/quality assurance (QA/QC) procedures for forest inventory including field data collection and data management shall be applied"; and, probably the strongest indicator: "The targeted precision level for biomass estimation within each stratum is ± 10% of the mean at a 95% confidence level." (section 8.2.2)*

If SCS however, feels this is not enough, we will amend the methodology further.
Auditor Response: Section IX, as written, refers to uncertainty in choice of parameters. It is not clear how the standard referred to in the methodology can be applied to determining whether these types of uncertainties are significant, as that standard applies to greenhouse gasses that are included or excluded from the project. The targeted precision referenced in the methodology was interpreted as a guideline to be used when estimating sample size for inventory activities, not as a definition of significant uncertainty.

NIR 2 of 2 for January 7, 2010 was issued in response.

NIR Number 14 of 21 Dated December 14, 2009

Finding: It is unclear if the 5-10 year basis for assessing historical practice is sufficient for determining the baseline. The methodology developer must justify this time period, addressing the identification of long term trends, periodicity in management activities, and periodicity in management planning.
Proponent Response on December 28, 2009*: In response to this NIR, footnote 7 in section 4.1 of the methodology has been strengthened. However, the text is taken verbatim from the VCS tool on methodological issues: step 4 on page 6 in the section labeled: "establish a project baseline". We are unclear why this then needs further elaboration: it is a VCS standard requirement. But in any case, footnote 7 in section 4.1 of the methodology has been strengthened.*
Auditor Response: The 5-10 year time frame appears in the VCS document as part of a parenthetical

example (hence the e.g.) and should not be considered appropriate for all projects. The methodology developer should describe how a time period of 5-10 years is appropriate or provide another appropriate means of assessing the baseline.

NCR 14 of 17 NCRs for January 7, 2010 was issued in response.

NIR Number 15 of 21 Dated December 14, 2009

Finding: It is unclear whether the 'extrapolation of trends' is a modeling exercise. If it is a modeling exercise, the methodology developer must describe acceptable methods for linear and nonlinear trends. If it is not a modeling exercise, then the methodology developer must specify and justify how trends are extrapolated.
Proponent Response on December 28, 2009: *A footnote has been added (footnote 8) reading: "For instance, if once every 5 years field data are collected it is accepted practice to convert the trend over a 5 year period to annual values by dividing the parameter value by the number of years in between measurements" to clarify this issue.*
Auditor Response: The changes clarify the type of extrapolation that is intended. However, there was additional concern that the methods described could lead to bias in estimates of carbon removals because they apply a linear model rather than a non-linear model to tree growth.

NCR 15 of 17 NCR for January 7, 2010 was issued in response.

NIR Number 16 of 21 Dated December 14, 2009

Finding: Please supply the following references: Pulkki 1997 (Page 16, 26), Winjum et al 1998 (page 17) and Kinjo 2005 (page 29).
Proponent Response on December 28, 2009: *The references are attached with the following titles: 'Pulkki 1997', 'Winjum 1998' and 'Kinjo 2005'.*
Auditor Response: The findings have been addressed. The requested references have been provided. No new issues have been identified after examining the references provided.

NIR Number 17 of 21 Dated December 14, 2009

Finding: The methodology developer must justify the leakage factors for market-effects calculations. The methodology developer must provide peer-reviewed literature, VCS or CDM approved guidance to support the leakage factors.
Proponent Response on December 28, 2009: *This material has been taken from the VCS tool for methodological issues (page 8 and further) and guidance to the VCS standard*.
Auditor Response: The findings have been addressed. The leakage factors have been taken from VCS literature and are used appropriately.

NIR Number 18 of 21 Dated December 14, 2009

Finding: It is unclear how the estimated logging rate is applied to the baseline. The methodology developer must describe how the estimated rate applies to the baseline calculations.
Proponent Response on December 28, 2009: *The following text is added to the methodology, section 4.3.3:*

The logging rate is applied to the baseline by using the following formula:

$$\Delta C_{BSL,i,lr} = \sum_{t=1}^{t} (D\%_{planned,i,t} \times \Delta C_{BSL,i})$$

Parameter	*Description*	*Unit*
$\Delta C_{BSL,i,lr}$	*Net loss of carbon in the baseline scenario in stratum i corrected for logging rates*	$tCO_2\text{-}e\ ha^{-1}$
$\Delta C_{BSL,i}$	*Net loss of carbon in the baseline scenario in stratum i*	$tCO_2\text{-}e\ ha^{-1}$
$D\%_{planned,i,t}$	*Projected annual proportion of land that will be logged in stratum i at year t. If the actual annual proportion is known and documented (e.g. 25% per year for 4 years), set to proportion*	$\%\ yr^{-1}$
t	*Time elapsed since start of logging in proxy area*	*1, 2, 3…*
i	*Stratum in the baseline scenario*	*1, 2, 3…*

Auditor Response: The findings have been addressed. The role of the D% parameter in the baseline carbon accounting is now clear.

NIR Number 19 of 21 Dated December 14, 2009

Finding: It is not clear whether the methodology is applicable to grouped projects. If this is allowed, the methodology developer should specify how individuals in the group are accounted for under the methodology.

Proponent Response on December 28, 2009: *The proposed methodology is not applicable to grouped projects. The methodology developers have included an applicability condition to this effect.*

Auditor Response: The findings have been adequately addressed. It is now clear that the methodology is not applicable to grouped projects.

NIR Number 20 of 21 Dated December 14, 2009

Finding: The VCS Standard differentiates between the Project Start Date and Project Crediting Period Start Date. The Methodology does not define the way the project's start date, crediting period, or project crediting period start date will be determined. The methodology developer must clarify how these dates are established.

Proponent Response on December 28, 2009: The following text has been added to the section on "temporal boundaries":

The Project Crediting Period Start Date is defined by the VCS standard (2007.1) and is the date on which the 1st monitoring period commences.

The Project Start Date has equally been defined by the VCS standard (2007.1) and is the date on which the project began reducing or removing GHG emissions.

Project proponents shall determine the crediting period, the project lifetime, the crediting period start date and the project start date and provide verifiable evidence when the 1st monitoring period started and when the project began to reduce or remove GHG emissions.

Auditor Response: The revised document only partially addresses the findings. The revised language now defines the project's start date, crediting period, and project crediting period start date, but it does so using vague language. For example, the project start date is defined as the date on which the project began reducing or removing GHG emissions, but it is not clear which project actions constitute the beginning of reducing or removing GHG emissions for the specific project type for which this methodology is applicable.

OFI 3 of 3 for January 7, 2010 has been issued in response.

NIR Number 21 of 21 Dated December 14, 2009

Finding: The methodology does not require the establishment of a buffer of non-tradable AFOLU carbon credits. Likewise, the methodology does not require the use of the "Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination." The methodology developer must make this a requirement for projects using this methodology.

Proponent Response on December 28, 2009: *Text has been added to chapter 7 reading:*
"The total carbon benefits are exposed to risk of non-permanence. To address this risk, the VCS has developed a "Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination". Project proponents must apply this tool to determine the appropriate withholding percentage to create an adequate buffer of non-tradable AFOLU carbon credits. Such non-tradable AFOLU carbon credits will be deposited in the AFOLU Pooled Buffer Account."
Auditor Response: The findings have been addressed. The methodology now explicitly requires the use of the "Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination." This is a VCS-developed tool and is used appropriately in this context.

NIR Number 1 of 2 Dated January 7, 2010

Finding: The addition of applicability criteria limiting the methodology to tropical high forests addresses the lack of parameters for non-tropical forests. However, the term 'tropical high forest' is not defined in the methodology, so there is still reason for concern that the methodology will be applied to forests for which the supplied parameters are not appropriate. The methodology developer must define 'tropical high forest'.
Proponent Response on February 22, 2010, 2010: *The methodology is now only applicable to Evergreen Tropical Rainforest, using the FAO definition where the term "Evergreen Tropical Rainforests" is defined as follows: " Evergreen Tropical Rainforests occur where the annual rainfall is greater than 2,500 mm, where forests grow mostly at low elevations, are evergreen, luxuriant, predominantly of hardwood species, have a complex structure and are rich in both plants and animals. Soils tend to be shallow and poor in nutrients, features having a marked effect on forest management practices." Source: Source: http://www.fao.org/docrep/W8212E/w8212e03.htm#a definition of tropical forests*

Changes have been made throughout the document.
Auditor Response: An appropriately referenced definition has been provided.

NIR Number 2 of 2 Dated January 7, 2010

Finding: This finding is in response to NIR 13 of 21 for December 14, 2009. Section IX, as written, refers to uncertainty in choice of parameters. It is not clear how the standard given in chapter III, section 4 can be applied to determining whether these types of uncertainties are significant, as that standard applies to greenhouse gasses that are included or excluded from the project. The targeted precision referred to on page 56 was interpreted as a guideline to be used when estimating sample size for inventory activities, not as a definition of significant uncertainty. If it is to be interpreted both ways, the discussion of this targeted precision should be expanded, and it should be made clear how uncertainty in parameters propagates to quantifiable impacts on the precision level of biomass estimation.
Proponent Response on January 24, 2010: *See response to NCR 9. We suggest to draw upon the X-UNC module of AD Partners.*

Auditor Response: The proposed module adequately accounts for parameter uncertainty. See NCR 9.

NIR Number 1 of 1 Dated February 1, 2010

Finding: The methodology must provide or make reference to procedures for quantifying uncertainty in estimating project GHG benefits and apply an uncertainty based confidence deduction to ensure that issued VCUs are conservative.

Proponent Response on February 22, 2010: *The methodology has been completed with an annex covering the uncertainty assessment, in addition to amended equations for ΔC_{IFM} in Chapter VII.*

$$= \frac{100 - C_{IFM\_ERROR}}{100} * C_{IFM,t}$$

$$C_{IFM\_ERROR} = \sqrt{Uncertainty_{BSL}^{2} + Uncertainty_{WPS}^{2}}$$

The procedure for estimating C_{IFM_ERROR} is provided in Annex 2.

Auditor Response:
The added annex and revised equations provide adequate means for quantifying uncertainty and apply an appropriate confidence deduction.

Opportunities for Improvement:

OFI Number 1 of 2 Dated December 14, 2009

Finding: Observe that the Carbon Planet methodology is not yet approved. Modifications to the Carbon Planet methodology may occur before approval. Such modifications to the Carbon Planet methodology may also be applicable to this methodology.

Proponent Response on December 28, 2009: *The methodology developer acknowledges that such modifications may occur, and commit to ensuring that any modifications relevant to this proposed methodology will be accounted for. The methodology developer has included a footnote on page 5, to this effect.*

Auditor Response: The proponent response is adequate.

OFI Number 2 of 2 Dated December 14, 2009

Finding: For ease of reference, acronyms could be clearly defined in the definitions section, a glossary could be provided and equations could be numbered throughout the methodology.

Proponent Response on December 28, 2009: This OFI was not directly responded to.

Auditor Response: The methodology developer has elected not to provide a glossary or definitions section, but has numbered equations in the latest revision of the methodology.

OFI Number 1 of 3 Dated January 7, 2010

Finding: The equation for biomass of standing dead wood on page 19 is the volume of a cone times the density of wood. This equation is likely biased (predicts too little biomass) for many dead trees in decomposition class 2, as decomposition class 2 requires only that trees show signs of decomposition including loss of twigs, branches, or crown. Decomposition class 2 does not require that branches, twigs, or crowns have been completely lost from the tree. The use of such a biomass

estimate is conservative in the project case, but not in the baseline. More sophisticated models are available in the existing literature.

Proponent Response on January 24, 2010: *Two approaches are now provided:*

With basal diameter:

$$B_{SDWl,sp,i,t} = \frac{1}{3} * \pi * \left(\frac{BDia_{SDWl,sp,i,t}}{200} \right)^2 * H_{SDWl,sp,i,t} * D_{DWdc}$$

With basal and top diameter:

$$B_{SDWl,sp,i,t} = \frac{BDia_{SDWl,sp,i,t} + TD_{SDWl,sp,i,t}}{200} * H_{SDWl,sp,i,t} * D_{DWdc}$$

In selecting one of the 2 approaches provided above, project proponents must ensure that in the baseline case conservative estimates are obtained for dead wood.

Auditor Response: The changes to the methodology strengthen the conservativeness of dead wood accounting. Additional options have been provided for selecting an appropriate model for dead wood biomass. The explicit guidance to select a conservative model for dead wood biomass suggests that, when branches are damaged but intact, full tree allometric equations will be used rather than stem only models.

OFI Number 2 of 3 Dated January 7, 2010

Finding: This finding is in response to NCR 9 of 13 for December 14, 2009. The addition of summary sections has made the document more readable. However, editing errors such as grammatical mistakes, unusual sentence structures, and unclear language still occasionally make the methodology unnecessarily difficult to read.

Proponent Response on January 24, 2010: *The methodology developers acknowledge the OFI, and have attempted to:*

1. *Provide greater consistency and flow to the methodology, enabling potential project developers to better understand and follow the procedures.*
2. *Address grammatical errors, unusual sentence structures and unclear language.*
3. *Improve consistency in bookkeeping such as tracking i, t, j and others.*

Auditor Response: The readability of the methodology has improved considerably.

OFI Number 3 of 3 Dated January 7, 2010

Finding: This finding is in response to NIR 20 of 21 for December 14, 2009. The revised language now defines the project's start date, crediting period, and project crediting period start date, but it does so using vague language. For example, the project start date is defined as the date on which the project began reducing or removing GHG emissions, but it is not clear which project actions constitute the beginning of reducing or removing GHG emissions for the specific project type for which this methodology is applicable.

Proponent Response on January 24, 2010: This has been addressed in Section 3.2, by adding the following clarifications:

The Project Crediting Period Start Date is defined by the VCS standard 2007.1 (2008) and is the date on which the 1st monitoring period commences.

The Project Start Date has equally been defined by the VCS standard 2007.1 (2008) and is the date on which the project begins reducing or avoiding GHG emissions.

Project proponents shall determine the Crediting Period, the Crediting Period Start Date and the Project Start Date and provide verifiable evidence when the 1st monitoring period started and when the project begins to reduce or avoid GHG emissions.

We believe that it is necessary to not over-define the project start date. As there are multiple project activities that can be carried out within the conditions of the methodology (avoiding second round logging, and/or enhancement of carbon stocks) it is necessary to leave the exact activities that constitute the project start date to project developers, within the above framework.

Auditor Response: The methodology now requires project proponents to provide verifiable evidence of the project start date and 1st monitoring period start date. This is appropriate, as the activity that constitutes the beginning of avoiding or reducing GHG emission may vary across projects.

Appendix 1: Public comments and responses.

Responses to public comments on

VCS PROPOSED METHODOLOGY

IMPROVED FOREST MANAGEMENT
THROUGH AVOIDANCE OF RELOGGING AND
REHABILITATION OF LOGGED-OVER TROPICAL NATURAL HIGH FOREST

Face-the-Future BV

Carbon Planet Comments

No.	CP-CAR 01: General	Response	Auditor Response
	There are a number of general corrections required:		
(i)	Ensure consistency in chapter/section numbering - see pp. 2-3. For example, for section V the sub-section 5.1 is presented, while in section VI, the sub-sections are presented as 1 and 2	Has been completed.	The proponent response is adequate.
(ii)	Recommend re-phrasing: see p. 5, section II, paragraph 3: please rephrase "commercially interesting species" to "species of commercial interest"	Has been removed	The proponent response is adequate.
(iii)	Ensure consistency of terms - see p. 7 where "project participants (PPs)" is used, then see p. 10 where "project proponents" is used; also see p. 6 where *ex-ante* and *ex-post* are used then in p. 12, it is used as *ex ante* and *ex post*	Has been made consistent. The phrase 'project proponents' has been selected for use throughout the methodology.	"project participant" still appears in section 8.1, however the use of this term is deemed immaterial to validation under the standard.

(iv)	Number all equations	Has been done.	The proponent response is adequate.
(v)	Use a multiplication sign ' × ' instead of an asterisk in equations and ensure consistency throughout. For example, see p. 14 where an asterisk is presented and then p. 15 where the multiplication sign is presented	Has been changed. A multiplication sign has been used consistently throughout the methodology.	The proponent response is adequate.
(vi)	Sum individual strata to present total carbon in the project area. For example, see equations on p. 14 for the parameter $C_{BSL,i}$	Addressed in accordance with SCS NCR 8. In case 1 (a-spatial) the methodology defines deltaC BSL based on C BSLpre minus C harvest etc. In case 2 (Ref Area) the methodology defines deltaC BSL as C BSLpre minus C BSLpost. Cases 1 and 2 are comparable with the gain-loss and stock change methods, respectively.	The proponent response is adequate.
(vii)	Consider parameters on an annual basis, and then ensure consistency throughout. For example, see p. 15, second parameter table wherein the parameter $V_{harvest,i}$ has been assigned the unit of $m^3\ ha^{-1}\ yr^{-1}$ while the parameter $C_{harvest,i}$ only has the unit of $tC\ ha^{-1}$ (without the yr^{-1}). The authors should decide whether or not to use yr^{-1} in all parameters or to state up-front that all parameters are considered on an annual basis and not include yr^{-1} in the units	All equations revisited. In all equations necessary, it has been made explicit where the parameter is assessed on an annual basis through the use of t or yr^{-1}.	A few inconsistencies remain; see most recent response to NCR 8.
(viii)	Ensure that all units are represented correctly - for example, see p. 15, parameter CF in the parameter table, has units of $t\ d.m.^{-1}$; see also p. 17, parameter D_j in the	As above, the consistency and accuracy of all equations has been addressed.	The proponent response is adequate.

	parameter table, has unit s of $\underline{d.m.m^{-3}}$; see also p. 18, parameter CF_j in the parameter table, has units of $\underline{tC\ t^{-1}\ d.m.}$		
(ix)	For the all indicator/counters such as stratum *i*, the unit should not be "1, 2, 3...". The unit in this case for the stratum is "dimensionless" and the description should be "stratum in the baseline scenario where $i = 1, 2, 3 \ldots I$". A final counter, *I*, is necessary in the description	This has been changed for all parameter tables.	The proponent response is adequate.
(x)	Ensure consistency of presentation for all equations. Since the authors have decided to account for parameters at time *t*, then all equations should be presented in this way. For example, see equation on p. 17 for the parameter $C_{harvest,ty,t}$ and then equation on p. 15 for the parameter $C_{harvest,i}$. Thereafter, please also consider the equations in Section 4.4 (p. 24 ff.), where the *necessary* parameters need to be considered at time *t*.	As above, all equations have been reviewed, and where necessary ensured the time component is present.	The proponent response is adequate.
(ix)	A Reference list is required.	Included all references as footnotes.	A complete, centralized reference list is recommended for convenience to the reader, but is not material to validation because references are included in footnotes.
No.	**CP-CAR 02: Applicability Conditions Regarding Regrowth**	**Response**	
(i)	In section II. Applicability Conditions, the second dot	• The applicability condition to which this	The methodology has been

	point (p. 6), states that "... regrowth of tree biomass following secondary logging in the baseline can in some cases be assumed to be zero. Where this is not the case, *ex-ante* estimates of regrowth must be made and monitoring of the baseline for *ex-post* confirmation of regrowth rates must be conducted." In Section 4.3 Baseline Net GHG Emissions, it reiterates that for Case 1: the baseline case is static and is estimated from the timber removed, collateral damage, decomposition in deadwood and carbon storage in harvested wood products, i.e. no regrowth. Then for Case 2: the baseline case is estimated as for the 1st case but also subtracts regrowth. Whilst a calculation of regrowth is provided in the methodology in Section 4.3.4, p. 23, via the parameter, $\Delta C_{woody,exist,t}$, there is no indication of where this parameter feeds back into the equation for the baseline emissions (ΔC_{BSL}) for Case 2.	CAR refers has been changed to: *"In the baseline, the logged-over forest in the project area is unlikely to revert to normal regrowth patterns due to excessive amounts of vines and climbers, which may include climbing bamboos, resulting from high-intensity logging operations in the past. In such cases, and subject to appropriate substantiation, regrowth of tree biomass before and following relogging in the baseline can be assumed to be zero. Where this is not the case, ex-ante estimates of regrowth must be made and monitoring of the baseline for ex-post confirmation of regrowth rates must be conducted;* Section 4.3 has been reworked to ensure that the parameters referred to above, feed back in to ΔC_{BSL}	substantially revised since this comment was issued. The equations for estimating baseline GHG emissions are now clear.
(ii)	For the scenario where Case 1 applies, it is assumed that there is no regrowth. Since underestimation of regrowth from the accounting of emissions due to logging will result in an overestimation of the net anthropogenic emission reductions of the IFM-LtHP project activity, it should be a requirement that the Project Developer (see also CP-CAR 01 for term consistency, whether authors	This has been addressed and included within section 4.3.5. "If no or insignificant regrowth occurs following first and subsequent logging, e.g. due to the complete colonization by climbers and vines, this must be demonstrated by	The proponent response is adequate.

	decide to use Project Proponent / Project Participant) provide adequate justification for this assumption. There is adequate evidence in the literature that proves that regrowth can occur following logging (Priyadi *et al.*, 2006). As the Project Developer has access to the logged area, direct measurements of regrowth from permanent sample plots in logged areas can be feasibly implemented. Thus, for conservativeness it is recommended to include a parameter for regrowth for both Cases 1 and 2.	sampling above-ground carbon stocks in woody biomass in a time series of logging coupes (e.g. in tranversal studies). The length of the time series shall not be shorter than 75% of the length of the crediting period."	
No.	**CP-CAR 03: Calculations of Emission Reductions from IFM-LtHP**	**Response**	
	The equation to calculate the total carbon benefits of the IFM project activity (ΔC_{IFM}) is presented in Section VII. Net project GHG Emission Reductions and Removals (p. 40). $$\Delta C_{IFM} = \left(\Delta C_{BSL} + \Delta C_{WPS}\right) - C_{leakage}$$		
(i)	It would be helpful for the reader (i.e. Project Developer) if this equation was presented ahead of all the other equations in order to understand the overall approach of the IFM-LtHP methodology. In addition, this equation requires a parameter table to clarify the units of these main parameters.	This equation has been added to the methodology summary, ahead of all other equations as suggested. As such it indicates what the rest of the methodology will be detailing.	The proponent response is adequate.

		A table of parameters has been added in the original place of the equation, in Section VII.	
(ii)	The equation presented in the IFM-LtHP Methodology features a parameter ΔC_{WPS}, the net removals through the enhancement of forest growth due to liberation thinning and enrichment planting. This parameter is not present anywhere else in the methodology and hence no guidance is provided on how to calculate this. It is likely that this value is a re-presentation of E_{WPS}, the net changes in carbon stocks and GHG emissions in the with-project scenario. No connection between these two parameters has been made to confirm this, as E_{WPS} is not linked to any of the other equations in the Methodology. Table 3 on p. 41 refers to $\Delta C_{PROJECT}$ to represent Project Activity carbon stock changes and emissions, and $\Delta C_{BASELINE}$ to represent baseline carbon stock changes and emissions. Consistency with parameter labeling is required.	ΔC_{WPS} has been added.	The proponent response is adequate.
No.	**CP-CAR 04: Calculations of Baseline Net GHG Emissions**	**Response**	
	The equation to determine the Baseline Net GHG Emissions for Method 1. Pre-logging Aspatial Data is presented as (p. 14):		

	$\Delta C_{BSL,i} = \left(C_{BSLpre,i} - \left(C_{harvest,i} + C_{damage,i} - C_{WP}\right)\right) \times \frac{44}{12}$		
(i)	This equation calculates the changes in the baseline carbon stocks per stratum, however, an overall value for the entire Project Area (i.e. a summation of the carbon stocks for all strata in the Project Area) is not provided to give the parameter, ΔC_{BSL}, that would feed back into the main equation to calculate net GHG emissions. See also CP-CAR 01 point (vi).	Addressed through SCS NCR 8.	The proponent response is adequate.
(ii)	The equation for the baseline activity contains a parameter for the carbon stock stored in wood products in the baseline, C_{WP}, (presented in stratified form in the parameter table, i.e. $C_{WP,i}$). On p. 18, this parameter is denoted as $\Delta C_{G\_WP,t}$. Consistent notation is required.	The parameter for carbon stock in wood products has been made consistent, accounting for stratum throughout the methodology, and denoted by $C_{WP,i}$	The proponent response is adequate.
(iii)	There are fundamental problems with this equation as it does not accurately predict what is occurring during logging and the emissions that will evolve. Emissions from the baseline activity can indeed be estimated by assessing the difference between the carbon stocks before and after the logging activity, as described by Method 2, Ex-post Mid to High Resolution Spatial Data (p. 21): $\Delta C_{BSL,i} = \left(C_{BSLpre,i} - \left(C_{BSLpost,i} + C_{WP}\right)\right) \times \frac{44}{12}$ where $C_{BSLpre,i}$ represents the carbon stocks before logging	This equation has been adapted. A parameter has been included to account for CDW,i, the post relogging carbon stock in dead wood. The issues surrounding the necessity of the mandatory inclusion of the deadwood pool have also been addressed. It is necessary to account for both what is removed from the project area, and what is left behind. Where management plans or	The proponent response is adequate. See also NIR Number 3 of 21 Dated December 14, 2009.

	and $\left(C_{BSLpost,i} + C_{WP}\right)$ represents the carbon stocks remaining in the project area after logging as well as the harvested wood pool. The difference between these two parameters would therefore be the emissions into the atmosphere $\left(\Delta C_{BSL,i}\right)$.	literature is used to calculate volumes of wood removed, the carbon gains will be over-estimated if the volumes of dead wood are not accounted for. Therefore it is necessary to combine both sources of information, and not accurate to address baseline net GHG emissions by 'directly addressing the emissions'.	
	However, using the same approach for Method 1, $\left(C_{harvest,i} + C_{damage,i} - C_{WP}\right)$does not represent the carbon stock remaining in the forest after logging. Take the carbon removed from harvesting, for example $\left(C_{harvest,i}\right)$. The merchantable log component of the harvest will go to a processing mill, a fraction will be made into processed logs and enter the harvested wood products pool and slowly oxidise with time, whilst a fraction of these logs will become residue(s) and hence undergo fast(er) oxidation to the atmosphere. Additionally, biomass from collateral damage will be left on the forest floor as part of the deadwood pool, and a fraction of this will decay into the atmosphere.		

	Table 1 (p. 8) indicates that the deadwood pool is "Optional", whilst p. 13, line 17-18 in Section 4.3, states that decomposition of the deadwood pool will be considered, but the equation for $\Delta C_{BSL,i}$ does not reflect this. In addition, there is no mechanism for the decay of the slash component (the branches and trimmings from harvesting) which would follow the same fate as biomass from collateral damage. Due to the complexity of the nature of transfer between carbon stocks for the harvesting process, it would be much simpler to assess the baseline net GHG emissions by directly addressing the emissions, i.e. what is removed from the project area, rather than applying the changes in carbon stocks, i.e., what remains in the project area.		
	Following this, baseline net GHG emissions would be a function of the decay of slash (branches and trimmings) and collateral damage of the deadwood pool, the oxidation of short term harvested wood products, and the oxidation of long term harvested wood products minus regrowth if present. As a consequence, the net anthropogenic emissions associated with the IFM-LtHP activity could be more simply expressed as the emissions due to the baseline activity (C_{BSL}) minus any emissions created by the with project scenario (E_{WPS}) minus any emissions associated with leakage of the baseline activity as a result of the IFM-LtHP activity ($C_{leakage}$).		

	For Example: $\Delta C_{IFM} = C_{BSL} - E_{WPS} - C_{leakage}$		
(iv)	On p. 13 of the methodology, point 1, it is indicated that the volume of biomass can be estimated from harvesting levels determined previously and reflected in management plans. This approach links with Method 1. Pre-logging Aspatial Data Calculations (p. 14). However, there is no indication of what parameters would be extracted from these plans and applied in the calculations (for example, $V_{harvest,i}$ in $m^3\ ha^{-1}\ yr^{-1}$).	The methdodology provides abundant information on what parameters to extract from these plans. See Section 4.3.1.	The proponent response is adequate.
(v)	On p. 19 of the methodology, wood waste fraction (WW) is described but an equation has not been provided. For consistency, an equation plus parameter table should be provided. Furthermore it is not shown how the parameter $C_{XB,ty}$ is related to $C_{harvest,ty}$. The unit for WW (shown in the parameter table on p. 18) is not clear since $\underline{tC\ tC^{-1}}$ can be interpreted as dimensionless, unless the authors are alluding to $\underline{(tC\ wood\ waste)\ (tC\ wood\ product)^{-1}}$. See also the units for SLF and OF.	An equation is not necessary, as the parameter WW is simply a fraction, and therefore there is no equation necessary to explain how to calculate it.	The proponent response is adequate.
(vi)	On p. 19 of the methodology, for the sub-section on "short-lived fraction (SLF)", it is stated that "where wood product class *ty* is unknown, are 100% oxidised within 5 years." This is not a conservative assumption since the wood product class *ty* albeit unknown, could have been converted into long-lived wood products, and hence oxidised over a much longer time period.	The phrase: "and where wood product class *ty* is unknown" has been deleted. This is justifiable because emissions/live times of long-lived wood products (as well as shorter lived wood products for that matter) are covered in the beginning of that same section in step 2. In addition, the 1st paragraph of this section "harvested wood products" states the following: "In case no	The proponent response is adequate.

		reliable assumptions can be made as to the timber classes of the harvested wood and its end use, general information from Forest Departments from that area reflecting breakdown of timber classes as they are normally harvested from this forest type and area may be used (e.g. plywood, round logs, sawn timber, etc.)." Therefore, there are not situations whereby the wood product class is unknown: all cases are covered.	
(vii)	Page 22 provides an equation for the rate for degradation, $D\%_{planned,i,t}$. However, there is no indication where $D\%_{planned,i,t}$ is fed back into the main equation(s) to calculate emissions in the baseline due to logging.	As per SCS NCR 3, this has been addressed.	The proponent response is adequate.
(viii)	For the scenario where no logging rate is available, a definition as to what a proxy area is was not provided to clarify how this information can be obtained by the Project Developer.	Details on the requirements of the reference area are provided as in Section 4.3.1: If emissions due to avoided timber harvesting in the baseline are determined based on activity levels in a Reference Area, project proponents must demonstrate that the quantification of avoided emissions in the with-project scenario is taking into account:	The term 'proxy area' has been replaced by 'reference area.' Requirements for choosing a reference area have been substantially strengthened.

		a. Similarity of strata and timber quantities: Similar strata in the Project Area and in the Reference Area will have similar quantities of timber, and therefore, it can reasonably be assumed that logging intensities in those strata in the Project Area are the same as the logging intensity that took place in the Reference Area; b. Areas for infrastructure establishment: The same percentages of land are likely to be liberated for roads and log landings in the Project Area compared with the Reference Area; and, c. Areas that do not contain merchantable timber and/or, are inaccessible for legislative, technical or economic reasons: Such areas must be excluded	

		from the area for which the changes in carbon stocks are estimated because they would have remained untouched in the baseline in any case.	
(ix)	The methodology suggests that a Reference Area may be required in the scenario where previous forest management plans for the project area cannot be obtained. In some cases it may be difficult to (a) obtain information about the Reference Area, and (b) have access to the Reference Area in order to implement monitoring of parameters. In addition, VCS Guidelines for AFOLU Projects on p. 21, footnote 29 states: "For new management entities with no history of logging practices in the project region, the baseline should reflect just the common practices and legal requirements. However, if the common practice is unsustainable and unsustainable practices contravene the mission of the implementing entity then a sustainable baseline is the minimum that can be adopted". These guidelines indicate that where harvesting plans are not available, either common practices, or a sustainable baseline should be adopted. An indication of what is common practice can be obtained from a National Code of Practice for Timber Harvesting, or equivalent document. Alternatively, a sustainable rate of logging can be derived from determination of the allowable merchantable cut in the	The methodology allows for either the use of a RA, as defined by strict criteria above, or for use of harvesting/management plans or other literature. Where a project developer decides to utilize a National Code of Practice of Timber Harvesting, or equivalent, for a specific project, this can be justified under the current requirements of the methodology.	The proponent response is adequate.

	project area from permanent sample plots of timber species of commercial interest, divided by the national sustainable logging/cutting cycle. Thus, the use of a Reference Area is not necessary in order to determine the rate of logging.		
No.	**CP-CAR 05: Selection and Justification of Carbon Pools**	**Response**	
(i)	Table 1 is unclear as to the definition of "Selected". If the authors define"Selected" as 'selected for inclusion in this IFM-LtHP methodology', then Table 1 does not conform to the VCS Guidelines. It is prudent for the authors to provide a column indicating the VCS' requirements as a comparison to what is "selected" in	The wording of this table has been changed to explicitly indicate which carbon pools are mandatory and which are not included. The VCS table presents only suggested	The proponent response is adequate.

	their methodology. See "VCS Tool for AFOLU Methodological Issues" p. 5. Note that for IFM-LtHP, the only mandatory pool is AGB trees. In the table presented by the VCS, the wood products pool is "Optional" but in the methodology the authors have stated "Yes".	guidelines for each project type. For this particular scenario, the wood products pool is believed to be a significant pool. Making it optional runs the risk GHG emissions in the baseline scenario being conservative, and therefore leads to a potential over-counting of project gains.	
(ii)	On p. 5, the project activities aim at "cutting of climbers and vines, liberation thinning and/or enrichment planting", while the baseline is logging. Since the baseline is logging, there is likely to be a greater increase in the deadwood pool (and therefore carbon in the deadwood pool) due to branches and trimmings, and from residual stand damage due to the baseline, than from cutting of climbers and vines, or liberation thinning/enrichment planting due to the project activity. It is queried as to why the carbon (in the deadwood) pool (see p. 8) would be anticipated to increase more under LtHP than in the logging scenario.	Acknowledged. As in the first set of SCS NCRs, this issue has been addressed. A deadwood pool has been included as mandatory. Deadwood is anticipated to increase less under LtHP, and therefore must be accounted for.	The dead wood pool is now included in the methodology.
(iii)	On p. 8, soil organic carbon is not included. However on p. 4, dot point 4 states to use the A/R CDM tool to assess if soil carbon may be conservatively neglected. It is not clear as to why the A/R CDM tool is needed if soil organic carbon is not included in the methodology. See also p. 6 footnote 3.	Soil organic carbon is not included within this methodology, and therefore the use of the tool has been removed.	The proponent response is adequate.
No.	**CP-CAR 06: Greenhouse Gases**	**Response**	

(i)	On p. 9, line 6: the authors have not considered materiality for Mega projects (see VCS (2008) "Voluntary Carbon Standard 2007.1", p. 22)	That notion has now been added. The end of the sentence now reads: "….shall be less than 5% of the total project GHG benefits except for mega projects where it shall be 1%….."	The proponent response is adequate.
(ii)	Reference used should be (VCS, 2008) instead of (VCS, 2007.1).	The reference has been amended.	The proponent response is adequate.
(iii)	On p. 9, Table 2: Natural disturbances such as forest wild fires have not been included.Note that it is not conservative to assume "no burning anticipated" since natural disturbances such as forest wild fires are difficult to anticipate and might occur during the project.	Biomass burning as a project activity is prohibited as per the applicability conditions of the methodology. The risk of forest fires is a matter on non-permanence risk and not subject to project carbon accounting. Table adapted to read allowed instead of anticipated.	A contribution to the AFOLU buffer pool using VCS approved tools is used to account for non-permanence risk. The proponent response is adequate.
No.	**CP-CAR 07: Section V - Project Accounting**	**Response**	

(i)	The calculation of E_{WPS}, is provided in the following equation (p. 30): $$E_{WPS} = E_{ATH} + E_{proj\_act} + GHG_{E,proj\_imp}$$ Whilst emissions due to the implementation of the project activity, $GHG_{E,proj\_imp}$, and emissions from the carbon stock changes as a result of the project activities (i.e. thinning and replanting), E_{proj_act}, are necessary to calculate emissions from the with-project scenario (E_{WPS}), inclusion of avoided emissions from timber harvesting (E_{ATH}) is not required here as it is already accounted for in baseline emissions (ΔC_{BSL}). Inclusion of E_{ATH} in this equation would lead to double accounting and is hence not conservative.	Chapter V entirely refurbished and limited to project accounting.	This comment is no longer relevant to the revised methodology.
No.	**CP-CAR 08: Equation for Project Activity Emissions**	**Response**	
(i)	For the calculation of the project activity emissions in Section 5.2, an equation to calculate the parameter, GHG_E (increase in non-CO_2 emissions as a result of the implementation of the project activity within the project boundary) is required plus guidance as to what these emissions could be and their source(s). Furthermore, if non-CO_2 emissions are to be accounted for, guidance must be provided to convert non-CO_2	Equations have been re-worked.	The revised equations clearly present all required calculations.

	emissions to carbon dioxide equivalents (CO_2-e). In addition, these emissions must be included in Table 2 on p. 9 along with a description of their sources.		
(ii)	On p. 32, the parameter table for the equation featuring, $E_{proj\_act,i,t}$, contains a parameter $\Delta C_{AGB,i,t=0}$. Based on the equation above the parameter table, it should be denoted as $C_{AGB,i,t=0}$.	This parameter has been amended in the equation.	The proponent response is adequate.
(iii)	The equation to calculate the project activity emissions does so at the strata level and on a per annum basis, $E_{proj\_act,i,t}$. However, in the main equation for Section V. Project Accounting, an overall value, E_{proj_act}, is applied. There is no equation summating the strata to provide the overall emissions for the entire project area.	The equation to calculate Eproj has been reworked. It now incorporates stratum, to provide overall emissions for the entire project area.	See NCR Number 1 of 17 Dated January 7, 2010
(iv)	For the BEF method, Step 3 refers to the selection of a biomass expansion factor (*BEF*) and root-shoot ratio (*R*). In order to select an appropriate *BEF* and *R*, guidance in the selection of *BEF* and *R* is necessary. For example, where can this factor and ratio be found, and what information is required (i.e. forest type, etc.). It has been noted that some guidance is provided in the monitoring section. It would be helpful if the relevant guidance for selecting parameters is featured in main section of the methodology where they are defined and applied.	As per the SCS NCR within the first round of findings, it has been found that the root:shoot ration R is not required, as the methodology deals only with AGB. As per all CDM methodologies, it is sufficient to state that a BEF must be selected in a conservative fashion. It is up to the project developer to justify the selected BEF, and the manner in which it has been chosen.	The proponent response is adequate.
(v)	Whilst the *BEF* is applied in Step 4 of this section (p. 34) to calculate the aboveground biomass (AGB), there is no guidance as to how *R* is applied, or any reference to the	As per the above, R is no longer included within the methodology.	The proponent response is adequate.

	fact that it is employed to calculate belowground biomass (BGB). The heading for this section is "Changes in Carbon Stock in Above Ground Tree Biomass"[18] and footnote 18 is the only instance where the calculation of BGB in this section is mentioned.		
(vi)	For the *BEF* method, Step 4, the parameter table describes $C_{AB\_tree,l.j,i,sp,t}$ as the "Sum of changes in above ground biomass of tree l of species j, in plot sp, in stratum i, at time t", however, there is no summation sign in the equation calculating this parameter and it is not clear what would be summated. In addition if the root-shoot ratio was to be incorporated as Step 3 suggests, the description would not apply to AGB only, it would be the total carbon stock (AGB and BGB) of the tree and perhaps this is what the "sum of changes" is intending to indicate. In addition, *R* should be included in the equation for $C_{AB\_tree,l.j,i,sp,t}$ and the subscript AB should be removed.	Steps and equations are amended to be in line with AR-ACM0002.	The proponent response is adequate.
(vii)	The unit for the sequence parameters for stratum and tree species is "dimensionless" (see also CP-CAR 01 point (ix)).	Amended	The proponent response is adequate.
(viii)	For the *BEF* method, Step 5 arrives at calculating the carbon stock in tree biomass for each stratum, $C_{tree,i,t}$, from the summation of the carbon stock in trees found in stratum i, in sample plots, sp, at time, t, denoted as $C_{tree,i,sp,t}$. However, the step to link $C_{tree,i,sp,t}$ to the	Amended	The proponent response is adequate.

	previously derived parameter in Step 4, $C_{AB\_tree,l.j,i,sp,t}$, which would be the summation of the individual trees, *l*, of species, *j*, and the summation of these species for a particular sample plot, sp, in stratum, *i*, is missing.		
(ix)	In the allometric method of section 5.2.1, Step 3 jumps to Step 6 which states, to calculate the mean carbon stock for each stratum, as per the *BEF* method. In order to create a better flow of sequential steps, Steps 3 through 5 should be included, and then referenced to the Steps and equations as provided in the *BEF* method. Step 6 should actually be associated with the following sentence on p. 36, i.e. Step 6: For both the *BEF* and allometric methods calculate annual changes in carbon stocks.	Steps and equations are amended to be in line with AR-ACM0002.	The proponent response is adequate.
No.	**CP-CAR 09: Emissions due to Infrastructure ($E_{clearing}$)**	**Response**	
(i)	As the project area is a previously logged area, it should be mentioned that the overall parameter associated with infrastructure, $E_{clearing}$, should be due to any new establishments of infrastructure for the baseline logging cycle.	Amended	The proponent response is adequate.

(ii)	Emissions associated with infrastructure are a summation of emissions from felling, biomass removal and grading. Emissions associated with biomass removal are based on the multiplication of an average carbon stock value per hectare that is representative of the project area, multiplied by the area assigned for infrastructure. $$E_{biomass} = C_{biomass} \times A_{infrastructure} \times \left(\frac{44}{12}\right)$$ There is no guidance on how to derive and measure, $C_{biomass}$, the biomass lost due to the clearing for infrastructure. In addition, an equation to show how the infrastructure percentage from Pulkki (1997) is applied to determine the parameter, $A_{infrastructure}$, should be provided.	$C_{biomass}$ equals the area-weighed C_{BSLpre}, see Equation 46. Rgarding A_infrastructure, the methodology now reads: "This can be done on the basis of remote imagery (photographs or satellite) or by using a reported percentage that is typical for the area. Such a percentage has to be derived from peer-reviewed literature applicable to the area, or from Pulkki (1997), who reported for conventional logging in Evergreen Tropical Rainforests, a conservative percent of area cleared for infrastructure of 12%. Footnote: Pulkki, R.E. (1997). Literature synthesis on logging impacts in moist tropical forests. FAO Working Paper GFSS/WP/06. Here a range of 12-17% is reported and hence for the baseline scenario a value of 12% is considered conservative.	The proponent response is adequate. $C_{biomass}$ applies the average pre logging biomass across strata. This is an appropriate way to determine a value for the average carbon stock value per hectare that is representative of the project area.
No.	**CP-CAR 10: Leakage**	**Response**	
	For an IFM-LtHP project, the VCS states that developers must demonstrate that there is no leakage within their operations including other lands they manage or operate outside the bounds of the VCS GHG project but within the		

	same country (VCS, 2008c; p23, Step 5 point 20), as well as consideration of leakage due to market effects (VCS, 2008c; p23, Step 5 points 23, 24 and 26).		
(i)	Whilst consideration of market leakage has been addressed, there is no guidance or procedure to account for leakage due to activity shifting by the Project Developer.	This is correct: an applicability condition already determined that biomass burning, fuel gathering, removal of litter, or removal of deadwood are not permitted in the project case within the project boundary. This has been extended to also cover the baseline scenario: "Biomass burning, fuel gathering, removal of litter, or removal of deadwood are not occurring in the baseline and in the project case within the project boundary"	Activity shifting leakage has been excluded from the methodology by an applicability condition, thus placing the burden of establishing that no activity shifting leakage occurs on the project proponent.
(ii)	The parameter associated with leakage, $C_{leakage}$, mentioned in section VII. Net Project GHG Emissions Reductions and Removals, is not presented in this section. It should be linked via an equation to the individual leakage components in this section.	Done. $C_{leakage}$, now C_{LK} in this methodology, equals $C_{leakage,MarketEffects}$ (now C_{LK-ME}).	The proponent response is adequate.
(iii)	The method for calculating leakage due to market effects, section VI. 2. Quantification of leakage, states: "AL equals emissions from harvests displaced through implementation of project activities which are the m^3 of timber that would have been removed from the project area in the baseline multiplied with the damage factor" An equation and parameter table should be provided to express this. In addition, the mathematical expression	*AL* has been changed to C_{REL} which includes carbon stocks in harvested timber, carbon loss due to damage to the residual stand, post-relogging carbon stocks stored in wood products in the baseline scenario and post-relogging carbon stocks in dead wood; all per stratum.	The proponent response is adequate.

	needs to be revised to include an average density and carbon fraction of the timber that would have been removed from the project area as AL has units of tCO_2. In addition, similar consideration to that provided in CP-CAR 04 point (iii) regarding the calculation of the emissions from harvesting, will need to be applied in the calculation of AL.	The consideration is to that provided in CP-CAR 04 point (iii) regarding the calculation of the emissions from harvesting, has been addressed there and since reference is now being made to C_{REL} this is addressed properly now too.	
(iv)	The selection of the leakage factor for market-effects, LF_{ME}, is based on the comparison of the mean carbon stock across strata in all pools in the baseline, C_{BSL}, with the mean national forest carbon stock (*NCS*) multiplied by specified fractions 1, 0.85 and 1.15, indicating the degree of deviation the project area carbon stock may be from the *NCS*. Below the parameter table on p. 40 it states "The mean carbon stock across all pools in the baseline is derived from the baseline modules and involves area weighing the stocks across the strata". The monitoring section indicates that C_{BSL} is determined in section 4.3 but there is no equation that relates C_{BSL}, with stratified carbon stocks, $C_{BSL,i}$.	C_{BSL} , in response to other CARs, has been amended to $C_{BSL,i}$. Therefore, this issue has been addressed.	The proponent response is adequate.
No.	**CP-CAR 11: Monitoring**	**Response**	
(i)	On p. 45, for the row "Source of data", point (d) - Table 3A.1.1.10 should be Table 3A.1.10 since the authors have made reference to the IPCC (2003).	Amended	The proponent response is adequate.
(ii)	Since authors are referring to Table 3A.1.10, point (d) should be corrected to reflect "Climatic zone" and	Amended	The proponent response is adequate.

	"Forest type", and not "species-specific".		
(iii)	Ensure correct units are presented in the monitoring section - see p. 46 for the unit of the parameter CF_j, presented as t C t^{-1} d.m., see also CP-CAR 01 point (viii).	Amended	The proponent response is adequate.
(iv)	On p. 46, for the row "Source of data", point (d), the authors have presented the default value as 0.5 t C t^{-1} d.m., while on p. 16 footnote 9, the authors suggest the use of 0.47 instead. Firstly, it is important to ensure consistency in values so authors should decide whether or not to use 0.47 or 0.5; secondly, the unit attached to the value 0.5 is not correct, see point (iii) and also CP-CAR 01 point (viii); and thirdly, within the unit, the "-1" should be superscripted.	The methodology provides the project developer with options of which factor to use. The monitoring table line d, allows for a reliance on a default value as a last resort.	A single value is now given for this parameter, and units have been corrected.
No.	**CP-CAR 12: Project Baseline Justification**	**Response**	
	VCS (2008), section 6.1 General requirements (for Methodologies), p. 18, states that VCS Program methodologies shall include (amongst other criteria) "determination criteria for the most likely baseline scenario". The IFM-LtHP is specific to a baseline activity of logging and hence it must be demonstrated that logging is the most conservative baseline scenario amongst all other possible land use alternatives. Guidance for the establishment and/or selection of criteria and procedures to identify and assess the potential baseline scenarios must be provided.	The methodology does not assume the baseline to be relogging. Relogging is one of the possibilities. Another possibility is that after first-round logging there is a stalled succession and the project intervention represents rehabilitation through, e.g., liberation thinning and/or enrichment planting. Procedures for baseline selection have been added.	The methodology has provided additional tools for selecting the baseline scenario and determining additionality.

Comments by Robert Seaton of Brinkman and Associates

No.	Specific comment	Response	Auditor Response
1	Applicability Conditions : For clarity, applicability conditions should be numbered, not bulletted.	As per all accepted AR CDM methodologies, the methodology developers have chosen to bullet rather than number applicability conditions.	This was not deemed material to validation.
2	Applicability Conditions : The first applicability condition tends to indicate that lands within the project area must be forest at time of project commencement, but does not explicately state it. The guidance on the nature of the project activities is not properly an applicability condition. This applicability conditions should be: • All lands within the project area must be forest at time of project commencement	The second draft of the methodology has made a number of changes to the applicability conditions. Applicability conditions have been adapted to be more specific and highlights that this methodology is applicable to situations whereby the original forest is natural tropical high forest, and whereby logging has already occurred.	Applicability conditions have been strengthened.
3	Applicability Conditions: The second applicability condition appears to have two problems. First, it is unduly restrictive. Second, it fails to deal with the case in which the forest will regrow, but future logging will maintain it at a lower carbon density. This second problem would not be an issue if the rest of the methodology were not continually making reference to future logging as a part of the baseline – see for instance Section III.1 Geographic Boundaries Para 4. This applicability condition could be either:	The applicability condition has been adapted to: • In the baseline, the logged-over forest in the project area is unlikely to revert to normal regrowth patterns due to excessive amounts of vines and climbers, which may include climbing bamboos, resulting from high-intensity logging	The methodology has been developed specifically for the situation in which the project area is unlikely to revert to normal growth patterns because of past management activities. The methodology is not applicable to projects in which future management is expected to maintain the forest with a reduced carbon density.

	• Due to impacts of past management, forests within the project area are unlikely to return to normal growth patterns and carbon densities under the baseline scenario. or • Due to impacts of past management, forests within the project area are unlikely to return to normal growth patterns and carbon densities under the baseline scenario, or the impacts of future management are expected to maintain the forest with a reduced carbon density. The authors need to figure out what case or cases they are drafting this methodology for. The second part of this applicability condition as currently written is properly speaking guidance on accounting for carbon pools under the baseline, not an applicability condition	operations in the past. In such cases, and subject to appropriate substantiation, regrowth of tree biomass before and following relogging in the baseline can be assumed to be zero. Where this is not the case, *ex-ante* estimates of regrowth must be made and monitoring of the baseline for *ex-post* confirmation of regrowth rates must be conducted;	
4	Applicability Conditions : Third applicability condition should properly read • Carbon stocks in non tree vegetation are not expected to be significantly greater at any time under the Baseline Scenario as compared with the Project Scenario This condition might prove to be problematic for some projects, however. Ideally, I would prefer that the methodology include methods for estimating non-tree vegetation, and eliminate this applicability condition.	Amended	The methodology developers have elected to retain this applicability condition. The methodology is not applicable to projects in which non tree vegetation is expected to be significantly greater under the project scenario than under the baseline. Removal of non-tree vegetation represents of significant management activity under the project scenario.
5	Applicability Conditions : Applicability condition #6 regarding	The applicability condition is necessary to	The proponent response is

	removal of biomass appears to be a bit odd, given that earlier in the document there is reference to enhancement of commercially valuable species, presumably for later sustainable harvest. I am not sure that this applicability condition is really necessary, either. I would eliminate if possible.	prohibit the following activities: biomass burning, fuel gathering, removal of litter, or removal of deadwood. Harvesting, selective logging have been removed from this applicability condition.	adequate.
6	Project Boundaries, paragraph 2. "Areas within the project area where logging has been prohibited due to environmental, cultural or other reasons, must be determined through maps and spatial analysis and be excluded from the calculations of emission reductions or removals." I'm not sure why this is the case. If past management activities have so degraded the forest that return to natural regrowth and carbon sequestration patterns are unlikely, it seems to me that the area could still be eligible for treatment and crediting, even if future logging is prohibited. I would eliminate this sentence.	Agreed. The methodology has been adapted to allow for either the avoidance of further logging, or the enhancement of carbon stocks, or both. This has been made explicit on page 7, prior to the applicability conditions: In particular, this methodology is applicable to improved forest management practices that achieve the conversion of low-productive forest to high-productive forest (LtHP) through the protection of logged-over, degraded forest from further logging[1] or the adoption of silvicultural techniques increasing the density of trees, in particular the density of species of commercial interest, or a combination of these activities.	The proponent response is adequate.
7	Section III.1 Para 4 – this appears to be a misinterpretation of the VCS guidance. I would eliminate this paragraph, since it will only cause problems for the proponent.	Not agreed.	
8	Section III.3 The justification on below ground biomass, litter and soil organic carbon are wrongly stated. Should read "Conservative aopproach - unlikely to be significantly greater	The carbon pools included have been re-addressed. Above ground biomass, dead wood and stored wood products have	The carbon pools included in the methodology have been revised. The proponent response is

[1] Category 4 under the IFM section of the VCS. Page 3 of the "Tool for AFOLU Methodological Issues"

	under the Baseline Scenario as compared with the Project Scenario at any time within the Crediting Period" As currently stated the justification might be too restrictive.	become mandatory, whereas other pools are not accounted for within this methodology.	adequate.
9	Section III.4 Significant problems in the table relative to the rest of the methodology. • Logging does not appear to be necessarily the baseline activity, so the note on Fuel emissions should be changed. • If burning, fertilization, etc are not to be accounted, restrictions on these activities should be applicability conditions. "Not anticipated" is not a sufficient statement. The autors appear to confusing the project realities of the project that they have in mind with the methodology.	The inclusion of fuel emissions has been adapted to state: "Included subject to materiality if relogging is the baseline activity" Not anticipated has been changed to not included. Burning and use of fertilizer have been prohibited within the expansion of the applicability conditions.	The proponent response is adequate.
10	IV.4.1 (Note that the numbering of the sections is inconsistent) . The paragraph beginning "The following information shall be provided…" at the end of this section introduces a number of requirements which are not inherent in the additionality criteria. I would eliminate this paragraph, which is confusing and unduly restrictive.	Numbering has been made consistent. This paragraph has been removed.	The proponent response is adequate.
11	IV.4.2 First bullet. First sentence should read "Stratification is carried out based on carbon densities at time of project commencement.." Carbon stocks is incorrect, and once again there is real confusion aroubnd the logging issue. Logging might have happened many years ago if the area has become successionally "stuck", due for instance to domination by vines and creepers. The remainder of this bullet is not about	The section on stratification has been reworked for clarity, and to remove the confusion over the relogging.	The choice of the term 'carbon stocks' over 'carbon densities' was not considered material by the reviewer. The basis for stratification is clear.

	stratification, but about selection of credible baseline scenarios, and therefore does not belong here.		
12	IV.4.3 Again the methodology seems to have become stuck around logging issues, and not taken into account the entire dynamic of the ecosystem This entire section should be rewritten to provide substantive guidance on the determination of the baseline scenario, and the options for accounting carbon pools under that scenario. The other option would be to go back through the entire document and retitle and redraft it as a reduced intensity logging methodology, in which case the issue of failure to maturally regenerate would become moot.	This is acknowledged. The second draft of the methodology attempts to ensure clarity that the baseline is in all cases a stalled succession plus in some cases/areas re-logging. The entire section 4.3 has been re-worked to provide guidance on the accounting of the baseline scenario, for all included pools.	The proponent response is adequate.
13	IV.4.3 Third paragraph – completely confuses the regrowth issue. Are we accounting regrowth or not? If yes, then the second applicabilty condition is unnecessary.	Methodology and its equations have been restructured with respect to regrowth.	The methodology has been substantially altered since the version made available for public comment. The latest version of the methodology is more clear with regard to regrowth.
14	IV.4.3 Second paragraph page 14 – statement is not true. Other pools may be accounted, as they are shown as optional.	Amended	No carbon pools are optional in the latest revision of the methodology.
15	IV.4.3.1 Paragraph should begin “For the estimation of carbon pool impacts of future logging predicted under the Baseline Scenario, ...”	Within the updated methodology, this CAR is not anymore relevant.	N/A
16	IV.4.3.1 Page 16 Para 1. Estimation of F_{damage} raises a problem.	This issue is acknowledged and has been	The dead wood pool has been

	If this damage is being accounted as a reduction in the living biomass carbon pool, it should also result in an increase in the deadwood pool… which makes it highly likely that in fact the dead wood pool may be significantly greater under the baseline scenario than under the project scenario. There are two possible solutions: • Account the deadwood pool • Don't account for the damage under the baseline. This second option is conservative, and probably preferred, unless the proponents want to take on the complexity of accounting the deadwood pool.	addressed. Deadwood has been included as a mandatory carbon pool for inclusion.	accounted for.
17	IV.4.3.2 Here the authors are introducing ex-post monitoring of the baseline case. I think that they need to make a decision on whether they are including ex-post monitoring of the baseline or not, since earlier they indicated an ex-ante approach. Furthermore, if they are going to use a Reference Area, it needs to be defined as part of setting the geographic boundaries earlier in the methodology.	*Ex-post* monitoring of the baseline case has been included.	Monitoring and selection of the reference area has been clarified.
18	IV.4.3.4 A whole section on regrowth!!! Get rid of the second applicability condition, or get rid of this.	See response to earlier CAR.	N/A
19	IV.4.4 Omitting baseline activity emissions will <u>always</u> be conservative. I would suggest just omitting them. The real question is whether baseline activity emissions will always be greater than project activity emissions, in which case the <u>project</u> activity emissions could be omitted. Once again this comes back to the issue of logging under the baseline. If the baseline scenario must include future logging, then I suspect a clear case	Now amended to: "Project proponents may choose to omit accounting for those sources as that leads to conservative estimates of the overall carbon benefits of the project."	The proponent response is adequate.

	could be made for always omitting project activity emissions. Otherwise, no such case can be made, and accounting for project activity emissions must be decided on a case by case basis.		
20	IV.4.4.1.1 This is getting messy, since some of that biomass may in fact be used to create wood products. If the authors really want to get this deep into the complexities of the matter, they will have to sort out all of these issues to ensure no double counting, etc. between emissions and carbon pools. Furthermore, they will have to sort out the issue of residual infrastructure from previous logging (which clearly has taken place), which makes the quoted 15-17% figure immaterial. I would suggest that they eliminate all of this and stick to the accounting of the carbon pools on the land as being the core issue.	The methodology provides equations and parameters for accounting for the wood products pool. It states when not accounting for wood products is conservative.	The methods used for accounting for the wood products pool were deemed appropriate. To ensure conservativeness, the methodology now specifies the use of 12% (the low end of the range reported by Pulkki) in baseline accounting when a defensible figure from other peer reviewed literature can be obtained.
21	Section V para 1. At this point the authors begin to create needless complexity. The emissions that would have occurred have already been dealt with through the accounting of the baseline. The only thing to be accounted for the project scenrio is the carbon in tha carbon pools within the Project Area, plus potentially emissions from activities. I have not reviewed the rest of section V, since this problem creates a fundamental need to rewrite the section.	Entire Chapter V refurbished to only include project accounting.	N/A
22	Section VI. Two possible methods for determining market leakage effects are given, with the second one being presumably the option referred to in para 1 page 39. This should be explicate. If the authors wish to reference the ADP approach they should simply reference it without repeating it, since this will allow for ongoing improvements in the ADP module over time being immediately applicable to this methodology. (As an	Text has been clarified by introducing an option 1 and an option 2 and by deleting the reference to the ADP module.	The proponent response is adequate

	aside, the ADP approach, while having the benefit of being relatively simple, is not one I am fond of, since it does not represent an economics approach to what is after all an economics problem.		
23	Section VI No mention is made of displacement leakage, where subsustence activities such as firewood collection might be moved to another area as a result of the change in management regime under the project case. Do the authors consider this to have been captured in the VCS approach? If so, they should ensure that this is accounted separately if the ADP method is used, since it is not accounted in that section of the ADP method.	This methodology indeed does not provide for the quantification of emissions due to activity shifting as one of the applicability conditions (in amended version in response to CP CAR 10 (i)) determines that: "Biomass burning, fuel gathering, removal of litter, or removal of deadwood are not occurring in the baseline and in the project case within the project boundary"	The response was deemed acceptable as described above.