FIRST ASSESSMENT REPORT FOR THE REVISION TO THE REDD METHODOLOGY MODULES

SCIENTIFIC CERTIFICATION SYSTEMS

Setting the standard for sustainability™

Document Prepared By Zane Haxton

Methodology Element Title	REDD Methodology Modules	
Version	VCS Methodology VM0007 (REDD-MF): Version 2.0 VCS Module VMD0007 (BL-UP): Version 3.0 VCS Module VMD0017 (X-UNC): Version 2.0	
Methodology Element Category	Methodology	
	Methodology Revision	X
	Module	
	Tool	
Sectoral Scope(s)	Sectoral scope 14 (AFOLU)	

Report Title	First assessment report for the revisions to the REDD Methodology Modules
Report Version	6/25/2012
Assessment Criteria	VCS Version 3

Client	Field Museum
Pages	40
Date of Issue	6/25/2012
Prepared By	Scientific Certification Systems (SCS)
Contact	2000 Powell Street, Suite 600, Emeryville, CA 94608, USA http://www.SCScertified.com Email: tfrank@SCScertified.com Telephone: +1 (510) 452-8000
Approved By	Todd Frank
Work Carried Out By	Lead assessor: Zane Haxton Technical reviewer: Christie Pollet-Young

Summary:

This report describes the first assessment of the revisions to the REDD Methodology Modules (the "methodology element"), which were developed for the purpose of quantifying GHG emission reductions and removals attributable to projects that avoid forest degradation and deforestation. The purpose of the assessment is to assess the conformance of the methodology element to the VCS rules and current best practices for quantification of GHG emission reductions and removals. The assessment was performed through a desk review of the methodology element and other relevant documents. The methodology element complies with all of the assessment criteria, and the assessment team has no restrictions or uncertainties with respect to the compliance of the methodology element with the assessment criteria. The assessment team recommends that the VCSA approve the methodology element.

Table of Contents

1 INTRODUCTION

1.1 Objective

The purpose of the audit activity was to conduct a first assessment of the revisions to the REDD Methodological Modules ("the methodology element") in accordance with the guidance documents listed in Section 1.2 of this report.

1.2 Scope and Criteria

In accordance with the VCS Methodology Approval Process, the scope of the assessment included the following:

- Procedure for determining the baseline scenario: Assessment of whether the approach for determining the baseline scenario is appropriate, adequate and in compliance with the VCS rules.
- Baseline emissions: Assessment of whether the approach for calculating baseline emissions is appropriate, adequate and in compliance with the VCS rules.
- Quantification of net GHG emission reductions and/or removals: Assessment of whether the approach for calculating the net GHG benefit of the project is appropriate, adequate and in compliance with the VCS rules.
- Data and parameters: Assessment of whether the specification for monitored and not monitored data and parameters is appropriate, adequate and in compliance with the VCS rules.
- Adherence to the project principles of the VCS Program: Assessment of whether the methodology adheres to the VCS Program principles set out in the VCS Standard.

The proposed revision was assessed for conformance against the VCS Version 3, including the following documents:

- VCS Standard
- VCS Agriculture, Forestry and Other Land Use Projects (AFOLU) Requirements
- VCS Methodology Approval Process
- VCS Methodology Template

Unless otherwise indicated above, the assessment was performed against the most recent version of the relevant VCS guidance document.

In addition, the proposed revision was assessed for overall consistency with the prevailing version of the methodology. Pre-existing criteria and procedures within the prevailing version of the methodology were not considered to be within the scope of the assessment.

1.3 Summary Description of the Methodology Element

The REDD Methodology Modules were developed for the purpose of quantifying GHG emission reductions and removals attributable to projects that avoid degradation and deforestation.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

The primary method used for this assessment was document review, as described in Section 2.2 of this report.

2.2 Document Review

The assessment activity included a detailed review of the methodology element against the criteria of the guidance documents listed in Section 1.2 of this report. In addition, the proposed methodology was assessed for logical coherence, internal consistency, completeness, and consistency with current best practices for quantification of emission reduction and removals.

Review of the methodology element was complemented by a review of the published literature relevant to the development of the methodology element. The following articles were reviewed in order to ensure the conformance of the proposed revision with the guidance documents listed in Section 1.2 of this report:

- Eastman J R, Van Fossen M E, and Solorzano L A 2005 Transition potential modeling for land cover change. In Maguire D J, Batty, and Goodchild M F (eds), GIS, Spatial Analysis and Modeling. Redlands CA, ESRI Press: 357–86.

- Kim, O S. 2010. An Assessment of Deforestation Models for Reducing Emissions from Deforestation and Forest Degradation (REDD). Transactions in GIS. 14(5): 631-654.

- Pontius Jr, R G., W Boersma, J-C Castella, K Clarke, T de Nijs, C Dietzel, Z Duan, E Fotsing, N Goldstein, K Kok, E Koomen, C D Lippitt, W McConnell, A Mohd Sood, B Pijanowski, S Pithadia, S Sweeney, T N Trung, A T Veldkamp, and P H Verburg. 2008. Comparing input, output, and validation maps for several models of land change. Annals of Regional Science, 42(1): 11-47.

- Sangermano,F. Eastman, J R, and Zhu, V. 2010. Similarity Weighted Instance-based Learning for the Generation of Transition Potentials in Land Use Change Modeling. Transactions in GIS. 14(5): 569–580.

2.3 Interviews

No interviews were conducted as part of the assessment.

2.4 Use of VCS-Approved Expert

A VCS-approved expert was not utilized in the course of the assessment.

2.5 Resolution of Any Material Discrepancy

Potential material discrepancies identified during the assessment process were resolved through the issuance of findings. The types of findings issued by SCS were characterized as follows:

Non-Conformity Reports (NCRs) were issued in response to material discrepancies in the proposed revision. A material discrepancy could be defined as one of the following:

- An instance of nonconformance to the guidance documents listed in Section 1.2 of this report;
- An instance where the language of the methodology element required clarification in order to avoid ambiguity;
- An instance where the proposed methodology lacked internal consistency; or
- An instance where formulae in the proposed revision were not consistent with mathematical convention.

An adequate response for each issued NCR, including evidence of corrective action, was required before an assessment opinion could be reached.

New Information Requests (NIRs) were issued to the client when more information was needed to determine whether a material discrepancy existed. Issuance of an NIR did not necessarily signify the presence of a material discrepancy. However, an adequate response to all issued NIRs was required before an assessment opinion could be reached.

Opportunities for Improvement (OFIs) were issued to the client when an opportunity for improvement in the proposed revision was identified. Such opportunities for improvement did not constitute material discrepancies. OFIs were considered resolved on issuance, and therefore a response to issued OFIs was not required before an assessment opinion could be reached.

All issued findings have been resolved. All issued findings are described in Appendix A of this report.

2.6 Internal Quality Control

Internal quality control was maintained in accordance with SCS' quality control system.

As an important component of this system, a single workbook (the Findings Presentation Workbook) was used for the issuance, tracking and closure (if applicable) of all findings issued. In addition to containing all of the information on the findings, the Findings Presentation Workbook contains client responses to the findings (if applicable) and allows for multiple iterations of client and assessor responses. Finally, the Findings Presentation Workbook contains the assessor's comments at the closure of every finding. Therefore, the workbook provides a transparent record of the identification and resolution of material discrepancies identified throughout the assessment process.

In addition, all methodology assessments performed by SCS are required to undergo an internal technical review by an independent party who was not involved with the assessment activity. From review of the methodology element, the draft assessment report, and the assessment findings, as documented in

Appendix A of this report, the technical reviewer determined that the assessment was conducted according to the VCS rules and that the decision of the assessment team was justified.

3 ASSESSMENT FINDINGS

The proposed revision was found to be in full compliance with the VCS rules, as detailed in the following sections. It should be noted that nonconformities were identified with respect to the requirement of the VCS Module/Tool Template that "All sections must be completed using Arial 10pt, black, regular (non-italic) font." However, all instances of nonconformities seemed to originate in the formatting of the prevailing version of the REDD Methodology Modules, which were developed before the VCS Module/Tool Template was released. Therefore, such nonconformities were determined to be outside the scope of the assessment. Should the VCSA wish to enforce conformance with respect to the above requirement, it would be a simple matter to enforce such conformance independently of the methodology assessment process.

3.1 Applicability Conditions

This section is not applicable, as the applicability conditions are not within the scope of the assessment.

3.2 Project Boundary

The proposed revision made several modifications to the procedure for the selection of the carbon pools to be included within the project boundary. In the prevailing version of the REDD-MF methodology framework, the guidance for selection of the modules to be utilized (which thereby informs the carbon pools to be included in the project boundary) is set out in Table 1. Further guidance for carbon pools to be included in the project boundary is set out in Table 2. However, with respect to Table 1, Table 2 is either redundant (providing the same guidance) or inconsistent (providing conflicting guidance). Therefore, Table 2 has been eliminated from the proposed revision, and all the guidance for selection of carbon pools is contained within Table 1.

In addition, Table 1 of the proposed revision now indicates that the below-ground biomass (quantified in the CP-AB module), dead wood (quantified in the CP-D module) and soil (quantified in the CP-S module) carbon pools are excluded from the project boundary in those areas where unplanned deforestation is the baseline scenario. This exclusion is consistent with Section 4.3.1 of the VCS AFOLU Requirements, which indicates that the above pools are either categorized as "O" or "N" for REDD projects, and both the O and N categories indicate that the carbon pool may be excluded from the project boundary.

In summary, the modifications to the procedures for the definition of the project's physical boundary and sources and types of GHGs included are appropriate, adequate and in compliance with the VCS rules.

3.3 Procedure for Determining the Baseline Scenario

The proposed revision modifies the spatial model requirements in Step 3.1.1 (page 25) of the prevailing version of the BL-UP module such that models based on neural networks may be allowed. Based upon a review of the literature as discussed in Section 2.2, it is the opinion of the assessor that models based on neural networks may be valid for use in this context. For example, Eastman et al. (2005) found that the

Back Propagation Multilayer Perceptron Neural Network technique performed well for prediction of land cover change in a case study in Bolivia.

The proposed revision introduces new language to ensure transparency of spatial models, requiring the following: "To be transparent, the modeling system must provide feedback on the relative contribution of explanatory variables and assess model fit through comparisons with empirical data. Further, in applying the model/software, project proponents must provide clear documentation and justification for all model inputs and assumptions." This requirement may preclude the Back Propagation Multilayer Perceptron Neural Network technique, as Sangermano et al. (2010) indicated that this technique was not able to provide "feedback on the relative importance of the independent variables". However, other neural network techniques may currently exist, or be developed in the future, that allow models to provide such feedback.

The proposed revision modifies the minimum threshold for the best fit as measured by the Figure of Merit (FOM) in Step 3.3 (page 27) of the prevailing version of the BL-UP module. Rather than specifying a fixed threshold for a given baseline deforestation configuration, the proposed revision requires that "The minimum threshold for the best fit as measured by the Figure of Merit (FOM) shall be defined by the net observed change in the reference region for the calibration period of the model... The FOM value shall be at least equivalent to this value." This modification is supported by the research of Pontius et al. (2008), which indicates that a general positive correlation may be expected to exist between the FOM value in a region and the observed net change in that region. As the FOM is, in part, a function of the observed net change, this is not surprising. From a practical perspective, error in predicted location of deforestation should be of less concern when little deforestation has occurred in the reference region for location of deforestation (and, therefore, it is likely that little deforestation has occurred in the reference region for rate of deforestation and, thus, the baseline) than in those cases where substantial deforestation has occurred in the reference region for location of deforestation. Therefore, the revised guidance with respect to the minimum FOM value is defensible.

In addition, parameter $A_{BSL,RR,unplanned,t}$ in the prevailing version of the BL-UP module has been re-named as $A_{BSL,RRD,unplanned,t}$ in the proposed revision. This has resulted in no functional change to the module.

Finally, in Steps 2.1.1 alternate, 2.1.2.2 alternate and 2.1.2.3 alternate, the methodology developer removed language in the prevailing version of the BL-UP module indicating that the mean estimated value of parameter DP minus the 95% confidence interval of that estimate must be used as the value for parameter DP_j in Step 2.2.2 alternate. While the approach required in the prevailing version is undoubtedly conservative, it is unnecessarily so, as estimated GHG emission reductions and removals are, in the case of the population driver approach, discounted for uncertainty twice—once during application of the BL-UP module and once during application of the X-UNC module. As the proposed revision to the X-UNC module contains a single, holistic, statistically sound treatment of uncertainty where the population driver approach is used (see Section 3.8 of this report for further discussion), no treatment of uncertainty is necessary in the BL-UP module, and removal of the language indicated above is justified.

In summary, the procedures for determining the baseline scenario are appropriate, adequate and in compliance with the VCS rules.

3.4 Procedure for Demonstrating Additionality

This section is not applicable, as the procedures and/or tools for demonstrating additionality are not within the scope of the assessment.

3.5 Baseline Emissions

Although the proposed revision introduces no changes to the procedures for quantifying baseline emissions, it should be noted that Section 4.5.3 of the VCS AFOLU Requirements contains a series of requirements regarding the modeling assumptions to be employed by methodologies with respect to emissions from the below-ground biomass, soil carbon and dead wood carbon pools in the baseline scenario. As the above section contains substantive new requirements that were not contained within previous versions of the VCS AFOLU Requirements and other documents when the REDD Methodology Modules were first approved, the VCSA requested that the proposed revision be updated so as to be in conformance with the above requirements. The requirements were addressed by excluding the below-ground biomass, soil carbon and dead wood carbon pools from the project boundary in those areas where unplanned deforestation is the baseline scenario, as discussed in Section 3.2 of this report. In addition to being in conformance with the VCS rules with respect to the project boundary, as discussed in Section 3.2 of this report, the proposed revision brings the BL-UP module into conformance with Section 4.5.3 of the VCS AFOLU Requirements, as that section is clearly not applicable where the pools in question have been excluded from the project boundary.

3.6 Project Emissions

This section is not applicable, as the procedures for calculating project emissions are not within the scope of the assessment.

3.7 Leakage

This section is not applicable, as the procedures for calculating leakage are not within the scope of the assessment.

3.8 Quantification of Net GHG Emission Reductions and/or Removals

The proposed revision modifies the guidance for quantification of uncertainty in the X-UNC module for projects that avoid unplanned deforestation. Under the prevailing version, where deforestation rate is derived using regression equations of past deforestation rate versus time, the methodology user is required to incorporate the r^2 value (termed the “coefficient of determination”) as a measure of the precision of the uncertainty estimate. The prevailing version claims that “the r2 value presents an indication of how closely the data reflects the model and provides a simple method that can be used here without the need for high level statistics.” While this is true, the coefficient of determination is not, strictly speaking, a measure of the uncertainty of a given deforestation estimate that is derived through regression. Statistical techniques do exist that can allow the user to directly determine the confidence interval with respect to the deforestation estimate for a given year and (if applicable) RRD or RRL subset, and the proposed revision appropriately incorporates these techniques. Thus, the proposed revision of the X-UNC module is more directly in line with the requirement of Section 4.1.4 of the VCS Standard,

which states that “Where applicable, methodology elements shall provide a means to estimate a 90 or 95 percent confidence interval”.

Under the prevailing version of the X-UNC module, no guidance was provided to the user where the so-called “population driver” approach was used for baseline analysis in the BL-UP module. The proposed revision fills the gap by providing statistically sound guidance that is applicable to users of both the “population driver” and “simple historic” baseline analysis approaches.

No substantial changes are made with respect to the procedures for estimation of uncertainty where deforestation estimates are based on a long-term average (as in the BL-UP module), or where deforestation estimates are derived from the BL-PL or BL-DFW modules. The proposed revision does modify the form of many of the equations for propagating uncertainty, but such modification is purely stylistic in nature and does not impact the functionality of the equations or the integrity of the module itself.

In addition, the proposed revision incorporates a helpful “t*” symbology in the equations where cumulative total are calculated, where “t*” is the final year for which quantities are summed. The revised equations refer to the result of the equations as, using the final equation as an example, “Cumulative total net GHG emission reductions through time t adjusted to account for uncertainty” rather than “Cumulative total net GHG emission reductions at time t adjusted to account for uncertainty”, as is set out in the prevailing version. Such has no impact on the functionality of the equations, but emphasizes to the reader that the equations perform quantification on a cumulative, rather than periodic, basis. The prevailing version of the X-UNC module (as with all REDD Methodology Modules and the REDD-MF methodology framework) are structured to provide output on a cumulative basis, but this has not been made as clear as it could have been to the user. The prevailing version will help to bring clarity to the procedures.

Finally, the proposed revision to the REDD-MF methodology framework contains a revision to footnote 14 of the prevailing version, in accordance with the above paragraph.

In summary, the procedures for calculating the net GHG benefit of the project are appropriate, adequate and in compliance with the VCS rules.

3.9 Monitoring

This section is not applicable, as the monitoring procedures are not within the scope of the assessment.

3.10 Data and Parameters

Where applicable, changes have been made to the parameter tables for the X-UNC module. While changes have been made to the names of some parameters and some parameters that are no longer in use have been removed from the table, no changes have been made to the specification of the parameters.

In summary, the specification for monitored and not monitored data and parameters is appropriate, adequate and in compliance with the VCS rules.

3.11 Use of Tools/Modules

This section is not applicable, as no change is being proposed to the use of any referenced tools or modules. Therefore, the use of referenced tools or modules is not within the scope of the assessment.

3.12 Adherence to the Project Principles of the VCS Program

The methodology element adheres to the VCS Program principles set out in the VCS Standard, as described below for each principle.

The methodology element adheres to the principle of relevance by selecting the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the VCS program.

The methodology element adheres to the principle of completeness by including all relevant GHG emissions and removals, and including all relevant information to support criteria and procedures.

The methodology element adheres to the principle of consistency by enabling meaningful comparisons in GHG-related information.

The methodology element adheres to the principle of accuracy by reducing bias and uncertainties as far as is practical.

The methodology element adheres to the principle of transparency by disclosing sufficient and appropriate GHG-related information (i.e. providing sufficient and appropriate justification of procedures and criteria) to allow intended users to make decisions with reasonable confidence.

The methodology element adheres to the principle of conservativeness by using conservative assumptions, values and procedures to ensure that net GHG emission reductions or removals are not overestimated.

3.13 Relationship to Approved or Pending Methodologies

This section is not applicable, as the assessment is of a revision to an existing methodology.

3.14 Stakeholder Comments

No stakeholder comments were received for either the “Revision to REDD Methodology Module VMD0007” or the “Revision to REDD Methodology Module VMD0017”, which were both posted for public comment from March 6, 2012 through April 4, 2012.

4 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Please see Appendix A for a record of the findings issued, responses by the methodology developer and the assessment team, and justification for resolution of all findings.

5 ASSESSMENT CONCLUSION

The assessment team concludes that the proposed revision is in full compliance with the assessment criteria as described in Section 1.2 of this report. The assessment team strongly recommends that the VCSA approve the proposed revision.

6 REPORT RECONCILIATION

The revisions made to the proposed revision during second assessment are approved. The versions, dates of issue (as stated on the cover page of the methodology element) and file names of each methodology element that is receiving this approval are indicated below.

Methodology element	Version and date	File name
VCS Methodology VM0007 (REDD-MF)	Version 2.0, 6/13/2012	REDD-MFVersion2 13Jun2012.docx
VCS Module VMD0007 (BL-UP)	Version 3.0, 6/18/2012	BL-UPVersion3 Jun182012.docx
VCS Module VMD0017 (X-UNC)	Version 2.0, 6/13/2012	X_UNCVersion2 13Jun2012.docx

7 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

The following evidence of fulfillment of SCS' eligibility requirements is presented in accordance with Section 4.2 of the VCS Methodology Approval Process.

SCS has completed ten project validations under sectoral scope 14 (AFOLU). A summary of the first ten project validations performed by SCS is as follows:

Project and Project ID	Date validation report issued	Date project registered	Name of GHG program under which project registered
INFAPRO Rehabilitation of logged-over dipterocarp forest in Sabah, Malaysia (672)	8/31/2011	9/2/2011	Verified Carbon Standard
Natural High Forest Rehabilitation Project on degraded land of Kibale National Park (673)	9/6/2011	9/6/2011	Verified Carbon Standard
Protection of a Tasmanian Native Forest (Project 3: Peter Downie) (587)	3/18/2011	4/7/2011	Verified Carbon Standard

Redd Forests Grouped Project: Protection of Tasmanian Native Forest (641)	5/13/2011	7/1/2011	Verified Carbon Standard
Protection of a Tasmanian native forest – Project 1 – REDD Forests Pilot (605)	3/18/2011	5/3/2011	Verified Carbon Standard
Boden Creek Ecological Preserve Forest Carbon Project (647)	6/24/2011	7/18/2011	Verified Carbon Standard
Peri-urban bamboo planting around South African townships (Project ID confidential)	8/8/2011	12/8/2011	Verified Carbon Standard
Tree planting in South African townships (Project ID confidential)	9/2/2011	12/8/2011	Verified Carbon Standard
Rimba Raya Biodiversity Reserve Project (674)	8/31/2011	9/7/2011	Verified Carbon Standard
Reforestation Across the Lower Mississippi Valley (774)	4/20/2011	2/14/2012	Verified Carbon Standard

Note that the above is not necessarily an exhaustive list of all validations performed by SCS.

8 SIGNATURE

Signed for and on behalf of:

Name of entity: Scientific Certification Systems (SCS)

Signature: 

Name of signatory: Todd Frank

Date: June 25, 2012

APPENDIX A: LIST OF FINDINGS

Certification for a Sustainable World ™

VALIDATION UNDER THE VERIFIED CARBON STANDARD (VCS)

List of Findings

Reporter/Member:
The Field Museum

Project:
Revision to the REDD Methodology Modules

Reporting Period:
N/A

NCR 2012.1 dated 02/24/2012

Standard Reference: VCS Methodology Approval Process V3.3, Sections 3.2.1 and 6.2

Document Reference: proposed X-UNC revision (02/17/12); proposed BL-UP revision (02/17/12)

Finding: The VCS Methodology Approval Process requires that "Methodologies and methodology revisions shall be prepared using the VCS Methodology Template and modules and tools shall be prepared using the VCS Module Template." A current VCS template has not been utilized in the preparation of the proposed revisions.

Proponent Response: VCS had originally told us that we did not need to use the templates for our revisions. However, per the revised VCS guidance issued March 6, we have revised both modules and REDD-MF which also needed to be revised in accordance with the VCS template.

Auditor Response: All modules that are proposed for revision now use the VCS Methodology Template V3.1, as required.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.2 dated 02/24/2012

Standard Reference: Prevailing BL-UP module, Equation 12

Document Reference: proposed X-UNC revision (02/17/12), Equation 2

Finding: The proposed revision indicates that, when the population driver approach is used to assess unplanned deforestation in the baseline scenario, the uncertainty of Equation 2 must be quantified as parameter Uncertainty(BSL,RATE). However, it is unclear what value should be used for parameter DP in Equation 2 in the case that a different parameter DP(j) is used to quantify the rate of unplanned deforestation per person in each of j (multiple) RRD subsets, as is laid out in Equation 12 of the prevailing version of the BL-UP module.

Proponent Response: Former eq 2 has been removed to avoid confusion (DP parameter now only discussed in module BL-UP). Referenced independent variable value now explained in preceding paragraph:

"Note that for time t, the value of the independent variable referenced is the value for the entire RRD. For the population driver approach, the relevant value is total population (static approach) at time t or total change in population (dynamic approach) at time t – t-1, summed across all component population census units."

Further, guidance has been provided to explain how uncertainty in baseline rate is calculated when multiple subsets of the RRD, RRDj, are involved, each with their own regression predicting deforestation – errors are propagated across RRD subsets to produce an overall uncertainty value:

"If multiple subsets of the RRD are used, as in for the population driver approach where each RRDj may have its own regression, total uncertainty in the baseline rate is calculated by propagating errors below (uncertainty in the baseline rate of deforestation in each RRD subset j at time t (UncertaintyBSL,RATEj,t) is calculated using equation 1):

UncertaintyBSL,RATE,t= √(Σ_(j=1)^N▒〖UncertaintyBSL,RATE,t,j〗^2)

UncertaintyBSL,RATE,t = (2)

Where:

UncertaintyBSL,RATE,t Uncertainty in the baseline rate of deforestation at time t; %

UncertaintyBSL,RATE,t,j Uncertainty in the baseline rate of deforestation at time t for RRD subset j; %

t 1, 2, 3, …t years elapsed since the start of the REDD VCS project activity

j 1, 2, 3, …N subsets of RRD (sets of census units with separate DP parameters)"

Auditor Response: Equation 2 of the proposed revision now contains appropriate guidance for the propagation of error from the RRD subset level to the total project area level. Therefore, the identified issue has been resolved.

The assessor understands that formatting errors exist within the version of the equation that has been copied into SCS' Findings Presentation Workbook (and, therefore, reproduced in the List of Findings). However, the assessor asserts that the version of the equation that exists within the module itself is without material error.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.3 dated 02/24/2012

Standard Reference: Prevailing BL-UP module, Equation 12

Document Reference: proposed X-UNC revision (02/17/12), Equation 2

Finding: The proposed revision indicates that, when the population driver approach is used to assess unplanned deforestation in the baseline scenario, the uncertainty of Equation 2 must be quantified as parameter Uncertainty(BSL,RATE). Equation 2 combines projected area deforested across multiple census units within the reference region of projected deforestation (RRD). As it is not clear how uncertainty in projected deforestation is intended to be propagated from the census unit level to the RRD level, in the case where projected deforestation has been quantified at the census unit level (as in Equation 12 of the prevailing version of the BL-UP module), the guidance for quantification of parameter Uncertainty(BSL,RATE) in this context is likewise unclear.

Proponent Response: Uncertainty is not propagated from the census unit level, because confidence intervals, which are referenced to determine uncertainty, cannot be calculated for individual data points (i.e. census units, or individual years in the case of simple historic), but rather, by definition, from a series of data points (i.e. a group of census units constituting the RRD). Error is propagated across RRD subsets, explained above.

Auditor Response: Step "2.1.1 alternate" of the BL-UP module indicates that individual sampled households comprise individual data points where a Participatory Rural Appraisal or other survey method is used. However, the approach taken in response to NCR 2012.2 is sufficient to satisfy this NCR, as census units constitute a cluster of individual sampled households, and as the parameter of interest in this case is change in area deforested per change in population at the scale of the RRD, and not at the scale of the individual household.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.4 dated 02/24/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (02/17/12)

Finding: The proposed revision states that "Uncertainty in the baseline rate of deforestation (UncertaintyBSL,RATE) is calculated referencing the 95% confidence limits of the regression model, calculated using standard regression analysis techniques . [sic] For the value of the referenced independent variable (time or population) at time t, the half-width of the 95% confidence interval for the dependent variable (predicted deforestation) is calculated as a percent of the dependent variable (modeled) value." This guidance is not consistent with Equation 2, which indicates that, in the case where the population driver approach is used for baseline analysis, parameter A(BSL,RRD,unplanned,t) is a function not only of the predicted deforestation rate, as mentioned above, but also the estimated population growth rate. As Equation 1 specifies that parameter Uncertainty(BSL,RATE) is equal to the percent uncertainty in parameter A(BSL,RRD,unplanned,t), it is implied that uncertainty in population growth must be accounted for in parameter Uncertainty(BSL,RATE). If uncertainty in population growth must be accounted for, the procedures and criteria for such accounting are not clear.

Proponent Response: Former equation 2 removed, to avoid confusion (and avoid cross-referencing back to BL-UP), and to appropriately focus attention on the regression output/end product parameter A(BSL,RRD,unplanned), against which uncertainty is assessed, not against any preceding calculations or inputs to deriving A(BSL,RRD,unplanned). This approach conforms with other VCS-approved REDD methodologies, e.g. VM0006 and VM0009, which can also employ covariates in regressions, but only assess uncertainty around the regression output (predicted deforestation); note that VM0015, which also can employ covariates in regression, currently has NO uncertainty assessed for baseline rate of deforestation. Further, it should be noted that BL-UP establishes a number of requirements to ensure robust projections of population when using the population driver approach (i.e. minimizing of uncertainty around population projections is addressed in BL-UP) – requirement to use official government census statistics and projections, demonstration of increasing rates over multiple historic time intervals to allow modeling growth at increasing rates.

Auditor Response: Former Equation 2 has been removed, and the proposed revision currently contains no indication that uncertainty of population growth rate must be quantified. Therefore, the identified issue has been resolved.

Closing Remarks: The Proponent’s response adequately addresses the finding.

NCR 2012.5 dated 02/24/2012

Standard Reference: Prevailing REDD-MF, Section II, Step 5(C)

Document Reference: proposed X-UNC revision (02/17/12), Equation 1

Finding: Equation 1 of the proposed revision indicates that parameter Uncertainty(BSL,RATE) must be quantified at the yearly time-step when the population driver approach is used for unplanned baseline analysis, as parameter A(BSL,RRD,unplanned,t) is itself quantified at the yearly time-step. However, the prevailing version of the REDD-MF methodology framework indicates that parameter C(REDD_ERROR) is intended to be quantified at the end of each monitoring period. Unless each monitoring period is exactly equal to one year, it is not clear how uncertainty in parameter A(BSL,RRD,unplanned,t) in a given year is intended to be scaled upwards to provide uncertainty in the cumulative area deforested at the end of a given monitoring period.

Proponent Response: Modules X-UNC and REDD-MF have been changed to assess uncertainty at each time t (monitoring interval t2-t1, as per existing eq 8 REDD-MF module, rather than a time point t). Treatment changes in that uncertainty is now assessed against periodic performance, not cumulative performance (as previously).

For additional clarification, we have added the explanatory text below at the beginning of module X-UNC under “Procedures”:

“Note: throughout this module, uncertainty is assessed at time t, which represents uncertainty of emissions taking place in the monitoring period T = t2-t1, as used in module REDD-MF equation 8.”

This changes the approach from having a constant uncertainty rate (over each 10-year baseline period presumably) to having uncertainty assessed for each monitoring interval, which could be as short as annual. This approach acknowledges that uncertainty can change over time*, and allows that stock estimates may be updated, with different uncertainty around those estimates, periodically, for example in cases where forest growth or degradation/decline is taking place. The previous treatment with a constant uncertainty value did not allow for this.

* We would also like to point out that there is a certain elegance in this approach, in particular with respect to baseline rate regression models, namely in that by referencing the confidence interval, uncertainty increases as the projections go further out (e.g. into the future beyond a historic time trend), because regression confidence intervals always flare out at the ends.

Auditor Response: The proposed revision still does not contain procedures to quantify uncertainty in the area deforested at the end of a given monitoring period, in the case where a distinct uncertainty value is quantified for each year of the monitoring period. Although a monitoring period "could be as short as annual", as stated by the methodology developer in response to the NCR, the prevailing version of the REDD-MF methodology framework permits the monitoring period to be as long as 10 years. Unless each monitoring period is exactly equal to one year, it continues to be unclear how uncertainty in the deforestation rate in a given year is intended to be scaled upwards to provide uncertainty in the area deforested at the end of a given monitoring period.

Proponent Response 2: A new equation 3 was added to X-UNC to propagate uncertainty across years and produce a cumulative baseline rate uncertainty parameter through time t (see response to NCR 6 below).

Auditor Response 2: The proposed revision now contains a framework for the calculation of a cumulative uncertainty value at any given time, in a manner consistent with the REDD-MF methodology framework and the other REDD Methodology Modules.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.6 dated 04/23/2012

Standard Reference: Prevailing REDD Methodology Modules

Document Reference: proposed REDD-MF revision (03/11/12), Footnote 10

Finding: Equation 1 of the prevailing version of the REDD-MF defines parameter C(REDD,t) as "Total net greenhouse gas emission reductions at time t". It is contextually clear from review of the prevailing version that this refers to cumulative, rather than periodic, greenhouse gas emission reductions. However, the proposed revision has re-structured all aspects of the REDD-MF to refer to periodic greenhouse gas emission reductions occurring within a given year. This is not consistent with the prevailing versions of the following modules, all of which instruct the user to provide inputs to REDD-MF on a cumulative basis:

- BL-PL, which quantifies parameter ChangeC(BSL,planned) on a cumulative basis

- BL-UP, which quantifies parameter ChangeC(BSL,unplanned) on a cumulative basis

- BL-DFW, which quantifies parameter ChangeC(BSL,degrad-FW/C) on a cumulative basis

- LK-ASP, which quantifies parameter ChangeC(LK-AS,planned) on a cumulative basis

- LK-ASU, which quantifies parameter ChangeC(LK-AS,unplanned) on a cumulative basis

- LK-DFW, which quantifies parameter ChangeC(LK-AS,degrad-FW/C) on a cumulative basis

- M-MON, which quantifies parameter ChangeC(P) on a cumulative basis

Proponent Response: X-UNC was revised to produce a cumulative parameter Adjusted_ CREDD, t (cumulative total net GHG emission reductions through time t adjusted to account for uncertainty; t CO2-e) as used in the original REDD-MF, and REDD-MF was reverted back to original operation.

In REDD-MF, the original text of Section II Step 5 a, b and c has been restored. The footnote in Section II Step 5 b was revised to conform to the revised X-UNC.

The previous text inserted in the X-UNC introduction explaining that uncertainty is calculated for each year t was removed to avoid confusion (because final uncertainty is calculated as cumulative through time t).

A new equation 3 was added to propagate uncertainty across years and produce a cumulative baseline rate uncertainty parameter through time t (below).

"Uncertainty is then propagated across years to produce an estimate of cumulative uncertainty through year t.

〖Uncertainty〗_(BSL,RATE,t*)=√(Σ_(t=1)^(t*)▒〖(〖Uncertainty〗_(BSL,RATE,t)* Σ_(j=1)^N▒A_(BSL,RRD,unplanned,t,j) _)〗^2)/(Σ_(t=1)^(t*)▒Σ_(j=1)^N▒A_(,BSL,RRD,unplanned,t,j))

(3)

Where:

UncertaintyBSL,RATE,t* Cumulative uncertainty in the baseline rate of deforestation through time t; %

UncertaintyBSL,RATE,t Uncertainty in the baseline rate of deforestation at time t; %

ABSL,RRD,unplanned ,t,j Projected area of unplanned baseline deforestation in the RRD at time t for RRD subset j; ha

t 1, 2, 3, …t* years elapsed since the start of the REDD VCS project activity

j 1, 2, 3, …N subsets of RRD (sets of census units with separate DP parameters)"

X-UNC Part 1 Steps 2 and 3 were revised to remove time element (as per original operation). The final equation (6) in Part 1 propagating baseline uncertainty was revised to:

Incorporating rate uncertainty:

〖Uncertainty〗_(BSL,t*)=√(〖〖Uncertainty〗_(BSL,RATE,t*)〗^2+〖〖Uncertainty〗_(BSL,SS)〗^2)

(6)

Where:

UncertaintyBSL,t* Cumulative uncertainty in baseline scenario through time t; %

UncertaintyBSL,RATE,t* Cumulative uncertainty in the baseline rate of deforestation through time t; %

UncertaintyBSL,SS Total uncertainty in the combined carbon stocks and greenhouse gas sources in the baseline case; %

t 1, 2, 3, …t* years elapsed since the start of the REDD VCS project activity

X-UNC Part 2 was revised to remove time element (as per original operation).

X-UNC Part 3 was revised to incorporate parameter UncertaintyBSL,t* and calculate cumulative uncertainty through time t, CREDD_ERROR,t*.

The calculation of leakage is conservative in all instances and therefore uncertainty is not considered here. Total project uncertainty is therefore equal to the combined uncertainty in baseline and with-project estimates:

(9)

Where:

CREDD_ERROR,t* Cumulative uncertainty for REDD project activity through time t; %

UncertaintyBSL,t* Cumulative uncertainty in baseline scenario through time t; %

UncertaintyP Total uncertainty in the with-project scenario; %

t 1, 2, 3, …t* years elapsed since the start of the REDD VCS project activity

Where no ex post (re-)measurements of carbon pools or GHG sources have been made, i.e. uncertainty from these sources is already included in UncertaintyBSL,t*, cumulative project uncertainty through time t is therefore equal to uncertainty in baseline estimates:

(9)

Where:

CREDD_ERROR,t* Cumulative uncertainty for REDD project activity through time t; %

UncertaintyBSL,t* Cumulative uncertainty in baseline scenario through time t; %

t 1, 2, 3, …t* years elapsed since the start of the REDD VCS project activity

X-UNC Part 4 final equation was revised to incorporate revised parameter, CREDD_ERROR,t*, cumulative uncertainty through time t.

Auditor Response: The proposed revision has been altered to refer to total GHG emission reductions on a cumulative basis, in a manner that is consistent with the REDD Methodology Modules and also with the proposed revision to the X-UNC module. The terminology of the revision to footnote 14, which refers to "total net GHG emission reductions through time t" as opposed to "total net GHG emission reductions at time t" should actually make the REDD-MF methodology framework clearer and easier to follow.

The assessor understands that formatting errors exist within the version of the equations that have been copied into SCS' Findings Presentation Workbook (and, therefore, reproduced in the List of Findings). However, the assessor asserts that the version of the equations that exist within the module itself is without material error.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.7 dated 04/23/2012

Standard Reference: Prevailing BL-UP module, page 2

Document Reference: proposed BL-UP revision (04/20/12)

Finding: The proposed revision does not contain the output parameters table, on page 2 of the prevailing version, that is located under the sentence "This module provides procedures…" The absence of this table has caused the proposed revision to be inconsistent with the prevailing version of the BL-UP module as well as with the VM0007 methodology modules as a whole, as the REDD-MF and all prevailing modules of the VM0007 methodology contain a table that provides such information.

Proponent Response: This table was inadvertantly excluded during the reformatting of the module and has been restored.

Auditor Response: The table has been restored intact to the proposed revision.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.8 dated 04/23/2012

Standard Reference: Prevailing BL-UP module

Document Reference: proposed X-UNC revision (04/20/12)

Finding: The proposed revision suggests that Equation 1 must be used to quantify parameter Uncertainty(BSL_RATE,t) when the baseline scenario is quantified using module BL-UP. However, Equation 1 has no meaning when the population driver approach is used to quantify the baseline deforestation rate, as parameter A(BSL,RRD,unplanned,t) is not referenced by the population driver approach. It is not clear how the user of the population driver approach for estimation of the unplanned baseline deforestation rate is intended to quantify parameter Uncertainty(BSL_RATE,t).

Proponent Response: In BL-UP, output parameter in Step 2.2.2 alternate equation 13 has been renamed to ABSL,RRD,unplanned,t , to provide consistency with simple historic approach output, permitting equation 1 of X-UNC to function for both simple historic and population driver.

Auditor Response: As indicated, Equation 13, Step 2.2.2 alternate of module BL-UP has been revised such that both the simple historic and population driver approaches now populate a parameter named A(BSL,RRD,unplanned,t), and as such Equation 1 of the proposed revision is now consistent with module BL-UP.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.9 dated 04/24/2012

Standard Reference: Prevailing M-MON module

Document Reference: proposed BL-UP revision (04/20/12), Equations 16 and 17

Finding: As guidance for quantification of parameter C(BSL,i) and C(post,i) in Equations 16 and 17, respectively, the proposed revision states "It is conservatively assumed that parameters CBB_tree,i CSOC,i and CDW,i are equal to zero (i.e. that no emissions take place from these pools in the baseline)" and "For post deforestation carbon stocks, it is conservatively assumed that parameters CBB_tree,i CSOC,i and CDW,i are equal to zero (i.e. that no emissions take place from these pools in the baseline)", respectively.

This guidance contains the following inconsistencies with respect to the guidance of the prevailing version of the M-MON module:

- In Equations 5, 17, 18, 19, 23, 25 and 27 of the M-MON module, parameter C(BSL,i) is used. The parameter table in Section 6.3 indicates that parameter C(BSL,i) originates in modules BL-PL, BL-UP and BL-DFW. However, because of the above-cited guidance in the proposed revision, parameter C(BSL,i) may take on different values depending on which baseline module is utilized. As the VM0007 methodology allows more than one baseline module to be utilized for a single project, a situation may arise where it is unclear which value for parameter C(BSL,i) should be used.

- Above Equation 6 of the M-MON module, the module states "Carbon stocks in the selected pools (must be the same as those used in the baseline modules) must be measured and estimated using the methods given in modules CP-AB, CP-D, CP-L, CP-S." The proposed revision to the BL-UP module would cause the meaning of this statement to be unclear, as the pools C(BB_tree,i), C(SOC,i) and C(DW,i) may be "selected", according to the requirements of the REDD-MF methodology framework, and yet (depending on the meaning of the word "used") not used by the BL-PL module.

- Depending on the meaning of the word "used" that is inferred, if parameter C(P,post,u,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) included while parameter C(BSL,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) excluded, a nonconservative estimate of carbon stock loss caused by deforestation will result. It is stated below Equation 6 that "Carbon pools excluded from the project can be accounted as zero"; however, these pools are not excluded from the project by any of the proposed revisions.

- Parameter C(P,Dist,q,i), the value of which is subtracted from the value of parameter C(BSL,i) in Equation 23 of the M-MON module, is calculated with the inclusion of pools C(BB_tree,i), C(SOC,i) and C(DW,i), as can be seen in Equation 24. It is stated below Equation 24 that "Carbon pools excluded from the project can be accounted as zero"; however, these pools are not excluded from the project by any of the proposed revisions. If parameter C(P,Dist,q,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) included while parameter C(BSL,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) excluded, a nonconservative estimate of carbon stock loss caused by natural disturbance will result.

- Parameter C(P,i,t), the value of which the value of parameter C(BSL,i) is subtracted from in Equations 25 and 27, is calculated with the inclusion of pools C(BB_tree,i), C(SOC,i) and C(DW,i), as can be seen in

Equation 29. It is stated below Equation 29 that "Carbon pools excluded from the project can be accounted as zero"; however, these pools are not excluded from the project by any of the proposed revisions. If parameter C(P,i,t) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) included while parameter C(BSL,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) excluded, a nonconservative estimate of carbon stock gain will result.

Proponent Response: Note: finding for NCR 9 was revised to, per communication from auditor on 27 April 2012:

As guidance for quantification of parameter C(BSL,i) and C(post,i) in Equations 16 and 17, respectively, the proposed revision states "It is conservatively assumed that parameters CBB_tree,i CSOC,i and CDW,i are equal to zero (i.e. that no emissions take place from these pools in the baseline)" and "For post deforestation carbon stocks, it is conservatively assumed that parameters CBB_tree,i CSOC,i and CDW,i are equal to zero (i.e. that no emissions take place from these pools in the baseline)", respectively.

This guidance contains the following inconsistencies with respect to the guidance of the prevailing version of the M-MON module:

- Above Equation 6 of the M-MON module, the module states "Carbon stocks in the selected pools (must be the same as those used in the baseline modules) must be measured and estimated using the methods given in modules CP-AB, CP-D, CP-L, CP-S." The proposed revision to the BL-UP module would cause the meaning of this statement to be unclear, as the pools C(BB_tree,i), C(SOC,i) and C(DW,i) may be "selected", according to the requirements of the REDD-MF methodology framework, and yet (depending on the meaning of the word "used") not used by the BL-UP module.

- Depending on the meaning of the word "used" that is inferred, if parameter C(P,post,u,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) included while parameter C(BSL,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) excluded, a nonconservative estimate of carbon stock loss caused by deforestation will result. It is stated below Equation 6 that "Carbon pools excluded from the project can be accounted as zero"; however, these pools are not excluded from the project by any of the proposed revisions.

- Parameter C(P,Dist,q,i), the value of which is subtracted from the value of parameter C(BSL,i) in Equation 23 of the M-MON module, is calculated with the inclusion of pools C(BB_tree,i), C(SOC,i) and C(DW,i), as can be seen in Equation 24. It is stated below Equation 24 that "Carbon pools excluded from the project can be accounted as zero"; however, these pools are not excluded from the project by any of the proposed revisions. If parameter C(P,Dist,q,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) included while parameter C(BSL,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) excluded, a nonconservative estimate of carbon stock loss caused by natural disturbance will result.

- Parameter C(P,i,t), the value of which the value of parameter C(BSL,i) is subtracted from in Equations 25 and 27, is calculated with the inclusion of pools C(BB_tree,i), C(SOC,i) and C(DW,i), as can be seen in Equation 29. It is stated below Equation 29 that "Carbon pools excluded from the project can be accounted as zero"; however, these pools are not excluded from the project by any of the proposed revisions. If parameter C(P,i,t) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) included while

parameter C(BSL,i) is calculated with pools C(BB_tree,i), C(SOC,i) and C(DW,i) excluded, a nonconservative estimate of carbon stock gain will result.

To avoid issues identified by the auditor in M-MON, the exclusion of belowground biomass, dead wood and soil carbon from quantification of pre- and post conversion stocks, added previously as part of this revision to BL-UP, has been dropped. Instead, to meet the VCS requirement, we have revised REDD-MF Table 1 to exclude these pools from unplanned deforestation projects, thus this exclusion now runs through all accounting for this activity, including ex post monitoring. The exclusion should always be conservative in operation and ensures consistent project boundaries and accounting among the baseline and project.

Regarding the conservatism of this approach, belowground biomass, dead wood and soil carbon tend to be net sources with deforestation (i.e. forest will almost never have lower stocks in these pools than non-forest land uses). Furthermore, although the exclusion of these pools in the project case results in lower project emissions, the net result in project accounting will always result in a conservative estimate, except in the rare case where project deforestation exceeds baseline deforestation (and in fact the same rare non-conservative outcome is possible with the currently approved modules and if the gradual emissions from these pools referenced in the latest VCS requirements are included), because baseline emissions are also lower and thus more conservative.

Table 2 of REDD-MF was removed to avoid confusion (it was inconsistent with Table 1 in the currently approved modules). Table 1 now is the exclusive source in the methodology for determining included/excluded pools.

Auditor Response: As mentioned in the client's response, the first bullet point of this NCR was withdrawn for the following reasons:

- Table 1 of the prevailing version of the REDD-MF methodology framework does permit the possibility that the dead wood and soil organic carbon pools could be included for the application of some baseline modules and excluded for the application of others (although the below-ground biomass pool must be included in all cases, as module CP-AB is mandatory in all cases).

- The prevailing version of the REDD-MF states on page 9 that “Where multiple baselines exist (planned deforestation, unplanned deforestation, forest degradation) there shall be no overlap in boundaries between areas appropriate to each of the baselines.”

- The possibility exists for a given stratum (as defined in module X-STR) to contain areas that are appropriate to more than one baseline, as there is no requirement in module X-STR that the stratification scheme consider the baseline module applied. While this could lead to confusion regarding the appropriate value of parameter C(BSL,i) in module M-MON, and the proposed revision to the REDD Methodology Modules may expand the potential for such confusion by mandating that the parameters C(BB_Tree,i), C(SOC,i) and C(DW,i) be set to zero in the quantification of parameter C(BSL,i), the root

cause of the problem lies with the prevailing version of the REDD Methodology Modules and not with the proposed revision.

The proposed revision has been altered to exclude the below-ground biomass, dead wood and soil carbon pools from the project boundary where unplanned deforestation is selected as the baseline scenario. This alteration effectively mitigates the inconsistencies that were identified with respect to the prevailing version of the M-MON module. As the above carbon pools are all notated "O" or "N" (indicating either "Carbon pool is optional and may be excluded from the project boundary"... or "Carbon pool does not have to be included...") in Section 4.3.1 of the VCS AFOLU Requirements, the exclusion of said pools is in conformance with the VCS AFOLU Requirements. The removal of Table 2, discussed in the client's response, does not create any integrity issues with respect to the prevailing version of the REDD-MF methodology framework. As noted by the client, Table 2 was not fully consistent with Table 1, and it is reasonable to have one table (Table 2) provide guidance regarding the modules/pools to be used/included in the GHG accounting.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.10 dated 05/04/2012

Standard Reference: NA

Document Reference: proposed REDD-MF revision (05/03/12), page 12 and Table 1

Finding: Table 1 of the proposed revision indicates that module CP-D is always excluded, and therefore the dead wood carbon pool is always excluded, where unplanned deforestation is the baseline scenario. This is not fully consistent with the language on page 12 of the proposed revision (and page 11 of the prevailing version), which states "Harvested wood products and dead-wood shall be included when they increase more or decrease less in the baseline than in the project scenario."

Proponent Response: The referenced text has been deleted to avoid confusion and because Table 1 already outlines all the requirements. Table 1 is now the sole source of information regarding carbon pool inclusion or exclusion.

Auditor Response: The language cited in the NCR has been removed by the methodology developer. Because the language is redundant in the prevailing version of the REDD-MF methodology framework, removal of the language will cause no loss of consistency or coherence.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.11 dated 05/04/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (05/03/12), Equations 2 and 3

Finding: Equations 2 and 3 refer to a parameter A(BSL,RRD,unplanned,t,j). However, this parameter is not defined anywhere within either the X-UNC module or the BL-UP module.

Proponent Response: This parameter was written incorrectly as it should reflect the projected deforestation for the RRD subset which is derived from BL-UP equation 13. It has been corrected.

Auditor Response: Equations 2 and 3 of the proposed revision to the X-UNC module have been revised to refer to parameter A(BSL,i,unplanned,j,t), which is quantified in the proposed revision to the BL-UP module.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.12 dated 05/04/2012

Standard Reference: NA

Document Reference: proposed REDD-MF revision (05/03/12), Equation 8

Finding: The following inconsistencies exist with respect to Equation 8 of the proposed revision:

- Parameter Adjusted_C(REDD,t), which is used in the equation, is not defined below the equation. Parameters Adjusted_C(REDD,t1) and Adjusted_C(REDD,t1) are defined below the equation, but are not used in the equation.

- The text immediately above the equation, as well as the definition of parameter VCU(t), indicates that the equation quantifies the number of Verified Carbon Units (VCUs) to be issued for a given monitoring period. However, if parameter Adjusted_C(REDD,t), as defined in footnote 14, is used within Equation 8 (as is the most logical course of action given the equation as it is currently written), the result of Equation 8 will be the total number of VCUs to be issued from the project start through year t.

Proponent Response: The original equation from the currently approved REDD-MF was inadvertantly not restored when the last revision was made. It has been restored as follows which also now corresponds with the parameters listed below the formula.

VCUt = (Adjusted CREDDt2 - Adjusted CREDDt1) - BufferTotal

Auditor Response: As noted, the equation from the prevailing version of the REDD-MF methodology framework has been restored to the proposed revision, leading to the resolution of the identified discrepancies.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.13 dated 05/04/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (05/03/12), Section 6

Finding: The equation references in the parameter tables in Section 6 of the proposed revision are now incorrect. In addition, the following parameters are defined in Section 6 but not used by the proposed revision:

- E(BSL,SS)

- E(P,SS)

- U(BSL,SS)

- U(P,SS)

In addition, the following parameters are used by the proposed revision but not defined in Section 6:

- E(BSL,SS,i,pool#)

- E(P,SS,i,pool#)

- U(BSL,SS,i,pool#)

- U(P,SS,i,pool#)

Proponent Response: The subscripts have been added to the parameter tables to avoid confusion.

Auditor Response: As noted, the parameter names in the parameter table have updated to those utilized by the proposed revision. However, the equation references (i.e. the row titled "Used in equations" in each parameter table) in the parameter tables in Section 6 of the proposed revision are still incorrect. Therefore, the NCR remains open.

Proponent Response 2: The equation references have been corrected.

Auditor Response 2: As indicated, the equation references have been corrected to be consistent with the X-UNC module.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.14 dated 05/09/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (05/08/12), Section 6

Finding: The following parameters have been omitted from the parameter tables in Section 6 of the proposed revision:

- A(BSL,RRD,unplanned,t)

- A(BSL,i,unplanned,j,t)

Proponent Response: These parameters have been added.

Auditor Response: As indicated, the parameters have been added to the parameter table. It should be noted that parameter A(BSL,i,unplanned,j,t) is defined as "Projected area of unplanned baseline deforestation in census unit i member of RRL subset j in year t" below Equation 2 of the methodology, but is symbolized as A(BSL,i,j,unplanned,t)" and defined as "Projected area of unplanned baseline deforestation in census unit i member of RRD subset j in year t" in the parameter table. This discrepancy is not deemed material by the assessor, as the RRL is equivalent to the RRD when the population driver approach is used for baseline analysis (as set out within the BL-UP module), and the reader should be able to discern that parameter A(BSL,i,unplanned,j,t) is equivalent to parameter A(BSL,i,j,unplanned,t) even though the order of the subscripts differs.

However, the parameter table indicates that parameter A(BSL,RRD,unplanned,t) originates in "BL-UP equation 13", a statement that is only true when the population driver approach is used for baseline analysis. When the simple historic method is used for baseline analysis, the parameter originates in Step 2.2 of the BL-UP module. The inconsistency between the statement in the parameter table and the location of the origin of the parameter A(BSL,RRD,unplanned,t) in the BL-UP module for the simple historic method may be a source of confusion to the methodology user, and therefore this NCR must remain open.

Proponent Response 2: The equation references have been corrected to avoid confusion.

Auditor Response 2: The parameter description for parameter A(BSL,RRD,unplanned,t) in the parameter table now correctly indicates that the parameter indicates in Equations 3 (for the simple historic baseline method) and 13 (for the population driver baseline method). Parameter A(BSL,RRD,unplanned,t) is actually quantified in a few different equations in the simple historic baseline method, one of which is Equation 3. Several of the equations are not numbered, and therefore cannot be directly referenced. In any case, the user of the simple historic baseline method will at least be directed towards the correct section of the BL-UP module. Therefore, the NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.15 dated 05/09/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (05/08/12), Equation 2

Finding: Equation 2 is presumably intended to quantify the uncertainty in the baseline rate of deforestation at time t as a percentage of the projected area of unplanned baseline deforestation at time t. However, as written, Equation 2 quantifies the uncertainty in the baseline rate of deforestation as a percentage of the projected area of deforestation within a single (unknown) RRL subset j at time t. Therefore, Equation 2 does not meet the intended purpose.

Proponent Response: Equation 2 was incorrectly written in our last submission. We apologize for the error and have corrected it.

Auditor Response: The identified discrepancy has been corrected, and therefore this NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.16 dated 05/09/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (05/08/12), Equation 3

Finding: Equation 3 is presumably intended to quantify the cumulative uncertainty in the baseline rate of deforestation through time t as a percentage of the cumulative projected area of unplanned baseline deforestation through time t. However, as written, the numerator of Equation 3 quantifies the sum of the squared products of uncertainty in the baseline rate of deforestation at time t and the summed projected area of unplanned baseline deforestation within a single (unknown) RRL subset j at time t. In addition, the denominator of Equation 3 quantifies the summed projected area of unplanned baseline deforestation within a single (unknown) RRL subset j at time t. Therefore, Equation 3 does not meet the intended purpose.

Proponent Response: Equation 3 was incorrectly written in our last submission. We apologize for the error and have corrected it.

Auditor Response: The denominator of Equation 3 now correctly sums across census units, RRL subsets and years. However, the numerator of Equation 3 continues to quantify the sum of the squared products of uncertainty in the baseline rate of deforestation at time t and the summed projected area of unplanned baseline deforestation within a single (unknown) RRL subset j at time t, which would lead to erroneous computation if applied literally by the methodology user. Therefore, the NCR must remain open.

Proponent Response 2: The summing term in the numerator was inadvertantly left out and has been corrected.

Auditor Response 2: Parameter A(BSL,i,unplanned,j,t) is now summed across census units and RRD/RRL subsets for each time period in the numerator of Equation 3. Therefore, Equation 3 now operates as intended, and this NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.17 dated 06/05/2012

Standard Reference: NA

Document Reference: proposed X-UNC revision (05/16/12)

Finding: Parameter A(BSL,i,unplanned,j,t) is defined as "Projected area of unplanned baseline deforestation in census unit i member of RRL subset j in year t" below Equation 2 of the module, but is symbolized as A(BSL,i,j,unplanned,t)" and defined as "Projected area of unplanned baseline deforestation in census unit i member of RRD subset j in year t" in the parameter table. The above discrepancy may be confusing to the user, and must be reconciled before the proposed revision can be approved.

Proponent Response: The parameter definition in Equation 2 has been revised to match exactly the definition in the parameter table and in BL-UP.

Auditor Response: As indicated, the parameter in question is now consistently symbolized throughout the X-UNC module as A(BSL,i,j,unplanned,t), which is consistent with Equation 12 of the BL-UP module. It is interesting to note that there are inconsistencies in the symbolization of the above parameter between Equations 12 and 13 of the proposed revision BL-UP module. However, as those same inconsistencies also exist within the prevailing version of the BL-UP module, they are considered to be outside the scope of the present assessment. The NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.18 dated 06/05/2012

Standard Reference: NA

Document Reference: proposed BL-UP revision (05/03/12), Section 7

Finding: The graph which constitutes Exhibit 1 has been cropped on the last page of the BL-UP module. As the removal of Exhibit 1 from easy reference would degrade the quality of the prevailing version of the BL-UP module, the observed cropping of Exhibit 1 constitutes a material error.

Proponent Response: The graph has been resized to fit within the text area to eliminate the cropping.

Auditor Response: As indicated, a page break has been inserted such that Section 7 of the BL-UP module now has its own page. Thus, the entirety of exhibit 1 is now displayed, uncropped, in the BL-UP module. The NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.19 dated 06/05/2012

Standard Reference: Prevailing REDD Methodology Modules

Document Reference: proposed REDD-MF revision (05/08/12), Section 5, Step 2b

Finding: Under "Date at which the project baseline shall be revised", the proposed revision contains the following language that is not contained within the prevailing version of the REDD-MF:

"A baseline revision shall be triggered whenever forest scarcity is encountered relative to the baseline rate of deforestation. If five or more years have passed since the start of the baseline period the baseline shall be immediately revised, if less than five years have passed the baseline shall be revised once five years have passed (see BL-UP)."

The term "forest scarcity" is not defined within the REDD Methodology Modules or the VCS Program Definitions, and must be defined in order to be used. In addition, the requirement that the baseline be revised, under some circumstances, on a schedule other than every 10 years is not consistent with the requirement, as stated in many locations throughout the prevailing version of the REDD Methodology Modules, that the baseline be revised every 10 years in all cases.

Proponent Response: The wording from the prevailing version has been restored. Small differences in wording in a few other areas were also noted and corrected.

Auditor Response: The language cited in the NCR has been removed by the methodology developer. Therefore, the NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.

NCR 2012.20 dated 06/07/2012

Standard Reference: Prevailing REDD-MF, Section I, page 5 and Section II, Step 1b

Document Reference: proposed REDD-MF revision (06/07/12), Section 5, Step 1b

Finding: Under "Date at which the project baseline shall be revised", the proposed revision states "For unplanned deforestation, the project baseline shall be revised every 10 years after the year of project start." This is not entirely consistent with the prevailing version of the REDD-MF, which states "For unplanned deforestation, the project baseline shall be revised every 10 years from the project start date." In addition, the above language of the proposed revision is not necessarily consistent with one of the applicability conditions of the prevailing version of the REDD-MF, which states "Baselines shall be renewed every 10 years from the project start date." The requirement to revise the baseline every 10 years from the project start is not necessarily equivalent to the requirement to revise the baseline every 10 years after the year of project start.

Proponent Response: The exact wording from the prevailing version has been restored.

Auditor Response: As indicated, the language under the heading "Date at which the project baseline shall be revised" has been revised to exactly match the language in the prevailing version of REDD-MF. Therefore, the NCR can be closed.

Closing Remarks: The Proponent's response adequately addresses the finding.