

BETHLEHEM AUTHORITY IMPROVED FOREST MANAGEMENT PROJECT 5TH VERIFICATION REPORT



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Summary:

Environmental Services, Inc., (ESI) was contracted by Blue Source, LLC. on 15 February 2017 to conduct the 5th monitoring period verification of the *Bethlehem Authority Improved Forest Management Project* [Project Description (PD) dated 18 March 2013]. The *Bethlehem Authority Improved Forest Management Project* is an Improved Forest Management (IFM) project implemented on 17,527 forested acres of a 22,536-acre split-parcel situated in Monroe County and Carbon Counties, Pennsylvania (PA). The project is achieving Greenhouse Gas (GHG) emission reductions through Extension of Rotation Age (IFM ERA). Through payments for ecosystem services, generated via the sale of Verified Carbon Units (VCUs), land managers are able to manage the forest resource with sound conservation and sustainable management practices. Project activities are promoting the natural characteristics associated with the native forests, including: ecological, scientific and aesthetic values.

Blue Source, LLC. is responsible for the coordination, management, and development of this project on behalf of the Project Proponent (the Bethlehem Authority or “the Authority”). Woodland Management Services, LLC. conducted the inventory field work, and performs the on-the-ground forest management. The Project Proponent (the Authority) is the legal landowner and the signatory to a contract with Blue Source, LLC. Other entities involved in the project include The Nature Conservancy (TNC), Pennsylvania (Easement Holder/Forest Advisor) and Spatial Informatics Group (Modeling Consultants). Blue Source, LLC is responsible for project implementation and on-going monitoring throughout the project’s lifetime.

The project is monitored annually, with monitoring activities assessing all Verified Carbon Standard (VCS) IFM ERA requirements (i.e. changes to project area/stratification, growth (sequestration) and losses (emissions) in forest carbon stocks (i.e. due to harvesting or natural disturbances), market leakage, and implementation of the forest management plan). Forest plots which experience harvesting are re-inventoried on-the-ground, and changes in carbon stocks are monitored through forest growth and yield modeling using the US Forest Service’s Forest Vegetation Simulator software. All sample plots will be re-inventoried at least once every ten years to calibrate forest growth models and allow for accurate forest carbon sequestration monitoring.

The verification assessed the Project’s compliance with the VCS Version 3 (and all associated updates), the selected methodology (VM0003 v1.1 - Methodology for Improved Forest Management Through Extension of Rotation Age (IFM ERA)), and the validated PD. The methods employed by ESI in the verification process were derived from all items in ESI’s internal verification process, which included utilizing VCS documents and ISO 14064-3 to develop and implement a Verification & Sampling Plan. This verification assessed the GHG emission removals through Agriculture, Forestry and Other Land Use (AFOLU) criteria, specifically, IFM ERA activities.

The scope of the verification included the assessment of the VCS Monitoring Report, and the implementation of GHG project as stated in the validated PD for the 01 January 2016 to 31 December 2016 monitoring period (fifth period).

The verification criteria followed ISO 14064-3 and the guidance documents provided by the VCS and included the following: VCS Standard, VCS Program Guide, Program Definitions, AFOLU Requirements, AFOLU Non-Permanence Risk Tool, and the VCS Methodology VM0003 (v1.1, 20 November 2012).

A summary of all findings is included in Appendix B. There are no restrictions of uncertainty.

ESI here confirms all verification activities including objectives, scope and criteria, level of assurance, monitoring and project documentation adhere to the selected methodology (VM0003, v1.1) and VCS Version 3 (and all associated updates) as documented in this report are complete. ESI concludes without any qualifications or limiting conditions that the *Bethlehem Authority Improved Forest Management Project Monitoring Report* (v3.0 dated 31 May 2017) meets the requirements of VCS Version 3 (and all associated updates) to a reasonable level of assurance for the fifth monitoring period.

The GHG assertion provided by the Project Proponent and verified by ESI has resulted in the GHG emission reduction or removal of 14,728 tCO₂ equivalents by the project during the fifth monitoring/verification period (01 January 2016 – 31 December 2016). This value is gross of the 10% (1,841 tCO₂ equivalents) buffer withholding based on the non-permanence risk assessment tool.

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1 INTRODUCTION

1.1 Objective

The verification objective included an assessment of compliance with VCS Version 3 and all associated updates, the selected methodology (VM0003, v1.1), and the validated Project Description (PD) *Bethlehem Authority Improved Forest Management Project* dated 18 March 2013. ESI (herein referred to as the Validation/Verification Body – VVB/Verification Team) assessed the Greenhouse Gas (GHG) emission removals for the fifth monitoring period/verification period 01 January 2016 to 31 December 2016 through Agriculture, Forestry and Other Land Use (AFOLU) criteria. The project activities are categorized as; “Improved Forest Management, Extended Rotation Age” (IFM ERA); specifically, this project utilizes VM0003 v1.1 (*Methodology for Improved Forest Management through Extension of Rotation Age*) within project scope 14: Agriculture, Forestry and other Land Use (AFOLU) Requirements. ESI assessed whether the Project Proponent adequately addressed project emissions, unplanned reductions in carbon stocks, and any possible leakage outside of the project boundary.

The non-permanence risk analysis was assessed for this verification. Further, following Section 2.1.2 of the VCS Validation & Verification Manual, V3.1, the objectives of the verification exercise were to evaluate the monitoring report and assess:

- The extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan.
- The extent to which GHG Emission Reductions or Removals reported in the monitoring report are materially accurate.

1.2 Scope and Criteria

The scope of the verification following Section 4.3.4 of ISO 14064-3:2006 included the GHG project implementation; physical infrastructure, activities, technologies and processes of the GHG project; GHG sources, sinks and/or reservoirs; types of GHGs; and time periods covered. The geographic verification scope is defined by the project boundary, the carbon reservoir types, management activities, growth and yield models, inventory program, and contract periods. *The Bethlehem Authority Improved Forest Management Project* follows the framework of project activities listed above in Section 1.1 and below. The scope of the Fifth Monitoring Period was outlined by the Project Proponent within the Project Description dated 18 March 2013 and is redefined as follows for the GHG project:

Baseline Scenario	A Legal/Common Practice Scenario consisting of commercial clear cuts down to an 8-inch diameter limit, with a matrix of complete patch cuts opportunistically interspersed amongst the greater harvest area, on a 30-year rotation.
Activities/Technologies/Processes	Utilization of VM0003, v1.1 - Extension of Rotation Age
Sources/Sinks/Reservoirs	Above-ground biomass Below-ground biomass Standing deadwood Wood products
GHG Type	CO ₂
Time Period (state date, crediting period, verification period)	Fifth Monitoring Period: 01 January 2016 to 31 December 2016
Project Boundary	17,527 forested acres (split parcel) Carbon and Monroe Counties, Pennsylvania (PA)
Total gross VCUs generated during Monitoring Period ¹	12,887 tCO ₂ e

The criteria followed the verification guidance documents provided by VCS located at <http://v-c-s.org/program-documents>. Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document. These documents include the following:

- *VCS Program Guide (v3.6 19 October 2016)*
- *VCS Standard (v3.6 19 October 2016)*
- *Program Definitions (v3.6 19 October 2016)*
- *Agriculture, Forestry and Other Land Use (AFOLU) Requirements (v3.5 19 October 2016)*
- *AFOLU Non-Permanence Risk Tool (v3.3 19 October 2016)*
- *VM0003 – Methodology for Improved Forest Management Through Extension of Rotation Age, v1.2*
- *Validated Project Description (dated 18 March 2013)*

¹ Gross of the 10% (1,841 tCO₂ equivalents) buffer withholding based on the Non-Permanence Risk Assessment Tool

1.3 Level of Assurance

The level of assurance was used to determine the depth of detail that the Verifier placed within the Verification and Sampling Plan to determine if there are any errors, omissions, or misrepresentations (ISO 14064-3:2006). ESI assessed the project's implementation of general principles, data collection and processing, sampling descriptions, documentation, *ex post* calculations, etc., to provide *reasonable assurance* to meet the Project Level requirements of the VCS Program. Based on the verification findings, a final evaluation statement reasonably assures that the project GHG representations are materially accurate. The evidence used to achieve a reasonable level of assurance is specified in subsequent sections of this report.

1.4 Summary Description of the Project

The *Bethlehem Authority Improved Forest Management Project* is an Improved Forest Management (IFM) project implemented on 17,527 forested acres of a 22,536-acre split-parcel situated in Monroe County and Carbon Counties, PA. The project is under a 60-year term conservation easement with The Nature Conservancy (TNC), PA, and is achieving Greenhouse Gas (GHG) emission reductions through Extension of Rotation Age (IFM ERA).

Through payments for ecosystem services (generated via the sale of Verified Carbon Units (VCUs), land managers are able to manage the forest resource with sound conservation and sustainable management practices. Project activities are promoting the natural characteristics associated with the native forests, including: ecological, scientific and aesthetic values. The project area (forested acres owned by the Project Proponent) is primarily composed of native mixed hardwood forests (mixed oak (*Quercus* spp.) and northern hardwoods), natural conifer stands (white pine (*Pinus strobus*) and red spruce (*Picea rubens*)), and conifer plantations (Norway spruce (*Picea abies*)). Within the Project Proponent's larger landholdings, there are wetland habitats harboring rare species and natural communities.

The project is extending the rotation age of the forest resource by approximately 70 years compared to the common practice baseline scenario via sustainable forest management practices. Management practices are being applied across the landscape to enhance local ecological features, remain in compliance with the conservation easement, follow the forest management plan, and maintain Forest Stewardship Council (FSC) Certification.

Blue Source, LLC. is responsible for the coordination, management, and development of this project on behalf of the Project Proponent (the Bethlehem Authority or "the Authority"). Woodland Management Services, LLC. conducts the inventory field work, as well as on-the-ground forest management. The Project Proponent (the Authority) is the legal landowner and the signatory to a contract with Blue Source, LLC. Other entities involved in the project include TNC, PA (Easement Holder/Forest Advisor) and Spatial Informatics Group (Modeling Consultants). Blue Source, LLC is responsible for project implementation and on-going monitoring throughout the project's lifetime.

The project is monitored annually, with monitoring activities assessing all the VCS IFM ERA requirements (i.e. changes to project area/stratification, growth (sequestration) and losses (emissions) in forest carbon stocks (i.e. due to harvesting or natural disturbances), market leakage, and implementation of the forest management plan). Forest plots which experience harvesting are re-inventoried on-the-ground, and changes in carbon stocks are monitored through forest growth and yield modeling using the US Forest Service's Forest Vegetation Simulator software. All sample plots will be re-inventoried at least once every ten years to calibrate forest growth models and allow for accurate forest carbon sequestration monitoring.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification assessed the Project's compliance with the VCS Version 3 (and all associated updates), the selected methodology (VM0003 v1.1), and the validated PD. The methods employed by ESI in the verification process were derived from all items in ESI's internal verification process, which included utilizing VCS documents and ISO 14064-3 to develop and implement a Verification & Sampling Plan. This verification assessed the GHG emission removals through Agriculture, Forestry and Other Land Use (AFOLU) criteria, specifically, IFM ERA activities.

The criteria followed the verification guidance documents provided by VCS located at <http://v-c-s.org/program-documents>. Unless otherwise indicated, the assessment was performed against the most recent version of the relevant VCS guidance document. Please see Section 1.2 of this report.

A project specific Verification and Sampling Plan was developed to guide the verification auditing process to ensure efficiency and effectiveness. The purpose of the Verification and Sampling Plan was to present a risk assessment for determining the nature and extent of verification procedures necessary to ensure the risk of auditing error is reduced to a reasonable level. Modifications to the Verification and Sampling plan were made based upon the conditions observed to detect the processes with highest risk of material discrepancy.

The Verification & Sampling Plan methodology was derived from all items in the verification criteria stated in Section 1.2. Specifically, the sampling plan utilized the VCS guidance documents and *ISO 14064-3*. For this verification, a field visit was not required as there were no significant natural disturbances. At this verification, similar to the last verification, the project proponents re-inventoried plots which occurred in a harvest during the reporting period. In previous reporting periods, ending in reporting period 3, the changes in carbon stocks were monitored through growth and yield modeling using FVS. Re-inventory of harvest plots to true-up the on-site stock estimates is more precise than modeling and represents a substantially more accurate approach to estimate on-site stocks. The desktop verification component included a full review of all project documentation/calculations received from the Project Proponent, including the VCS Monitoring Report.

2.2 Document Review

A detailed review of all project documentation was conducted to ensure consistency with, and identify any deviation from VCS program requirements, the applied methodology (VM0003 v1.1), and the validated PD.

Initial review focused on the validated PD and the MR, and included an examination of the project details, implementation status, data and parameters, and quantification of GHG emission reductions and removals. Along with a review of the MR, selected documentation was requested, provided, and subsequently reviewed for consistency, accuracy, and appropriateness regarding VCS program requirements, methodological requirements, and the validated PD. Documents reviewed include, but are not limited to, land ownership documentation, carbon rights contracts, property boundaries, financial analyses, Non-Permanence Risk Analysis (see Section 4.4 below), maps and aerial images, data from monitoring, biomass and carbon calculation spreadsheets, and responses to Non-Conformity Reports (NCRs) and Clarifications (CLs). The process of verification involved two formal rounds of assessment by the verification team and resulted in a MR that was in conformance with VCS rules.

Please see Appendix A for a complete list of documents received and reviewed by ESI.

2.3 Interviews

Interviews and informal discussions were conducted via telephone with project staff throughout the verification. Information provided in the Monitoring Report was supported through the comments from those interviewed. Meetings included discussions with:

Name	Title
Josh Strauss	Vice President – Forest Carbon Projects, Blue Source, LLC.
Cakey Worthington	Manager – Forest Carbon Projects, Blue Source, LLC.

Dr. Charles Kerchner	Senior Scientist, Spatial Informatics Group (SIG)
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2.4 Site Inspections

No site inspection was performed for this verification. Based on the prepared risk assessment, and evaluation of project changes through this fifth monitoring period there were no significant natural disturbances. Plots harvested during the reporting period and the inventory were updated appropriately. Changes in carbon stocks due to project harvesting for this period were not monitored through growth and yield modeling using FVS but instead harvested plots were re-inventoried. Based on this collective evidence, the verification team determined that an on-site inspection was not warranted. Further, through the course of verification activities, no information or important findings were discovered which required a site visit.

2.5 Resolution of Findings

During the verification process, if there was a risk that potential errors, omissions, and misrepresentations would be found. The actions taken when errors, omissions, and misrepresentations were found included: notifying the client of the issue(s) identified, and expanding our review/sample to the extent that satisfied the Lead Verifier's professional judgment.

This verification involved one formal round of assessment by the verification team and resulted in a MR that was in conformance with VCS rules. Where the Verification Team noted findings, the project developer implemented corrective actions by amending the MR and supporting documentation/calculations and providing written clarification responses. Types of findings were characterized in the following manner:

Non-Conformity Reports (NCRs) were, in general, issued as a response to material discrepancies when:

- MR, calculations, or other supporting documents were out of conformance with documents listed in Section 2.1 above
- Additional information was required by the validation team to confirm reasonable assurance for compliance

Clarifications (CLs) were, in general, issued when:

- Internal consistency among sections was lacking
- Mathematical formulae in sections were presented incorrectly
- Language within a section needed extra clarification to avoid ambiguity

Opportunities for Improvement (OFIs) were issued when the MR, calculations, or other supporting documents needed enhanced to benefit the general reader or to aid in the review process of the Verification Team.

During the verification, seven (7) NCRs, CLs, and OFIs were identified. All issued findings were satisfactorily addressed by the project developer. These findings provided necessary clarity to ensure the project followed the requirements of the VCS for GHG projects. For a complete list of all findings and their resolutions, please refer to Appendix B.

2.5.1 Forward Action Requests

No forward action requests were raised during the verification process.

2.6 Eligibility for Validation Activities

Validation activities were not undertaken as part of this verification assessment.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project has not been registered, and is not seeking registration, under any other GHG programs.

3.2 Methodology Deviations

The validated PD does not include any methodology deviations. However, during the second verification, methodology deviations were applied by the project developer/identified by ESI.

Findings related to those methodology deviations can be found in Section 3.2 of ESI's *Bethlehem Authority Improved Forest Management Project 2nd Verification Report* (dated 14 August 2014), available on the VCS website. The current verification (5th monitoring period) did not identify any additional methodology deviations. Evaluation of project changes for this verification did not result in any adjustments to the methodology deviations approved during the 2nd monitoring period verification.

3.3 Project Description Deviations

No PD deviations were noted during the project's initial verification (see 2012 Verification Report on VCS website). However, during the second verification, PD deviations were applied by the project developer/identified by ESI. Findings related to those PD deviations can be found in Section 3.3 of ESI's *Bethlehem Authority Improved Forest Management Project 2nd Verification Report* (dated 14 August 2014), available on the VCS website. The current verification (5th monitoring period) did not identify any additional PD deviations. Evaluation of project changes for this verification did not result in any adjustments to the PD deviations approved during the 2nd monitoring period verification.

3.4 Grouped Project

Not applicable, as this is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activities, as described in the validated PD, have been fully initiated. The project is extending the rotation age of the forest resource, as compared to the common practice baseline scenario, via sustainable forest management practices. Management practices are being applied across the landscape to enhance local ecological features, remain in compliance with the conservation easement, follow the forest management plan, and maintain FSC certification.

An inventory update was performed in 2016 through re-inventory of harvested plots 102, 104, 105, and 111, which adequately captured the growth (sequestration) in forest carbon stocks. The associated losses (emissions) in forest carbon stocks, as well as the sequestration in harvested wood products, were appropriately accounted for. As this is the fifth verification, all activities have been fully implemented and confirmed by the Verification Team through the desktop verification effort.

No material discrepancies were noted between the actual monitoring system, the monitoring plan set forth in the project description and the applied methodology. Monitoring activities were demonstrated to follow Section 3 – Monitoring Plan of the Monitoring Report for the fifth monitoring period. Further, the verification team confirmed that Section 2.1 of the monitoring report provided an accurate description of the implementation of the project.

The procedures outlined to estimate carbon stocks in specific pools within the project area, and the uncertainty of the estimates, have been implemented correctly. A minor error in quantification of net change in medium lived wood products following Equation 30 of VM0003 was discovered in 3rd verification period quantification. The cell reference error resulted in a previous under issuance and was confirmed to be well-below the VCS materiality threshold for a project less than 300,000 tCO₂e. The cell reference error was absent from fifth verification period quantification of Equation 30. Allometric equations were used appropriately and market leakage was calculated correctly. The result of the market leakage analysis indicated that additional specific leakage management activities are not required. Carbon stocks for all strata have been estimated in accordance with the methodology VM0003 v1.1.

No new methodology deviations were applied by the project developer/identified by ESI during this fifth monitoring period verification. Methodology deviations evaluated during the second monitoring period verification are included below from Section 3.2 of ESI's *Bethlehem Authority Improved Forest Management Project 2nd Verification Report* (dated 14 August 2014), available on the VCS website. The verification process confirmed that these methodology deviations are reasonable and have been appropriately justified. Further, the project is still in compliance with VCS rules while applying the methodology deviations. The deviations represent a deviation from the criteria and procedures relating to monitoring and/or measurement (but not quantification) of GHG emission reductions or removals as set out in VM0003 v1.1. Moreover, the deviations do not negatively impact the conservativeness of the quantification of GHG emissions reductions or removals as indicated in the table above.

Deviation	Verification findings
Stump Inventory for the Standing Dead Wood Pool: "The procedures for measuring standing dead wood in the project's forest inventory slightly deviate from those prescribed in the VM0003 methodology as stumps were not included in the project's field measurements. The exclusion of stumps increased both model accuracy and ensured conservatism in the projects carbon calculations and is therefore in conformance with the VCS Standard's requirement that the deviation "not negatively impact the conservativeness of the quantification of GHG emission reductions or removals." Excluding stumps for the project model is conservative because stumps are excluded from the dead pool in the Forest Vegetation Simulator (FVS, the VM0003 approved model utilized for the Bethlehem project) and, therefore, cannot be tracked, and the FVS-NE variant (associated with the project location) excludes stumps in the wood product volume equations. The result of these FVS exclusions is that stumps are essentially a "lost" pool and are considered immediate GHG emissions in the model. The implication of this is that if stumps were included in the project carbon inventory, they would only contribute to the standing dead pool in the project scenario. Clearly, accounting for stumps as stores of carbon in the project scenario, and as immediate sources of emissions in the baseline scenario would lead to an over crediting of VCUs."²	Verifiers reviewed Forest Vegetation Simulator (FVS) documentation and found that stumps are indeed not considered in wood product volume equations. Verifiers further agree with the assertion that the exclusion of stumps from the standing dead wood pool is conservative, and realize that inventorying stumps for a carbon inventory is somewhat unordinary and does not follow industry standards for a forest carbon inventory. Stumps represent a very small component of standing dead wood accounting and therefore the lack of inventoried stumps can be considered insignificant.
Recording Decomposition Class for the Standing Dead Wood Pool: "A five class system was initially used to identify level of decay in standing dead trees, based on the	The methods listed in the inventory document are often used in carbon inventories in the United States (i.e. the five class Harmon et. al. 2011 system). The descriptions for decay

² BETHLEHEM AUTHORITY IMPROVED FOREST MANAGEMENT PROJECT MONITORING REPORT, dated 08 August 2014.

inventory designer's familiarity with the five class Harmon et al. 2011 system. However, after data was recorded, classes 4 and 5 were merged to represent one class of dead trees with only the bole and no branches remaining. This left four total classes conforming to the descriptions of each class laid out in VM0003 v1.1.”³	classes 4 and 5 of the Harmon et al 2011 system are similar to class 4 as listed in VM0003 v1.1 (bole only, no branches). As such, ESI determined that merging Harmon et al 2011 classes 4 and 5 to represent dead trees with only a bole and no branches remaining is acceptable. The Harmon et al decay class 4 is defined as “Few or no limb stubs remain; the top is broken; a variable amount of bark remains; sapwood is sloughing; heartwood has advanced decay at the base and is sloughing in the upper bole.”⁴ Because limb stubs can remain for this decay class, classifying it as having no branches and being only the bole (VM0003 v1.1 class 4) is conservative.
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PD deviations are listed in Section 3.3 of ESI's *Bethlehem Authority Improved Forest Management Project 2nd Verification Report* (dated 14 August 2014), available on the VCS website, and none impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with VM0003 v1.1.

The GHG emission reductions generated by the project have not become included in an emissions trading program other than the VCS program and it has not received sought any other form of environmental credit as confirmed through a risk-based review by the verification team. Sustainable development contributions are not applicable to this project.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

ESI conducted an intensive review of all input data, parameters, formulae, calculations, conversions, statistics and resulting uncertainties and output data to ensure consistency with the VCS Standard, the validated PD, and VM0003 v1.1. Data with associated conversion factors, formulas, and calculations were provided by the project proponent in spreadsheet format to ensure all formulae were accessible for review. The Verification Team recalculated subsets of the analyses to confirm correctness and assess if data transposition errors occurred to achieve a reasonable level of assurance and to meet the materiality requirements of the project, as required by Section 5.1.3 of the VCS Standard. The project proponent also provided a step-by-step overview of calculations to ensure the verification team understood the approach and could confirm its consistency with VM0003 v1.1 and the PD.

³ Ibid.

⁴ *Differences Between Standing and Downed Dead Tree Wood Density Reduction Factors: A Comparison Across Decay Classes and Tree Species*. Harmon, Mark, E. et. al. 2011. USDA Forest Service NRS Research Paper NRS-15.

An overview of the data and parameters monitored, along with verification team findings, are included in the table below:

Data Unit / Parameter	Accuracy of GHG emission reductions and removals	Whether methods and formulae set out in the PD have been followed	Appropriateness of default values
A_i	Verification team confirmed the area of all stratum (8) were correct by recalculating. The value was traced to the quantification of carbon stock changes, project emission/removals and, ultimately net GHG emission reductions during the monitoring period.	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.
C_{IFM}	The net anthropogenic greenhouse gas removals by sinks was confirmed by the verification team by independently recalculating Equation 43 from the methodology. Input data was traced to its source and confirmed correct.	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.
DBH	Diameter at Breast Height values were measured and assessed as part of the 2 nd monitoring period field verification site visit. For this verification (5 th monitoring period), the Verification Team confirmed that the previously collected inventory data was appropriately used for inventory update FVS modeling (input) and that resulting DBHs and carbon stocking values were reflective of correct FVS modeling procedures. Verifiers independently ran the 2013 inventory data through FVS to quantify carbon stocking via the	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.

	imbedded allometric equations and achieved the same result.		
ΔC_P	The sum of the changes in above-ground biomass, dead wood and wood products in the project scenario was confirmed by the verification team by independently recalculating Equation 11 from the methodology. Input data was traced to its source and confirmed correct.	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.
H	Height values were measured and assessed as part of the 2 nd monitoring period field verification site visit. For this verification (5 th monitoring period), the Verification Team confirmed that the previously collected inventory data was appropriately used for inventory update FVS modeling (input) and that resulting heights and carbon stocking values were reflective of correct FVS modeling procedures. Verifiers independently ran the 2013 inventory data through FVS to quantify carbon stocking via the imbedded allometric equations and achieved the same result.	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.
PMP_i	Proportions of merchantable total biomass from FVS by stratum (an average) was checked for accuracy and found to be properly calculated as part of the comprehensive FVS data checks.	This parameter was reviewed and recalculated using methods set forth in the methodology and the PD and confirmed followed.	Not applicable.
$\Delta C_{WP,t1,t2}$	The annual carbon stock change in wood products between time t1 and t2, (averaged over a monitoring period) was confirmed correct through an	This parameter was reviewed and recalculated using methods set forth in the methodology	Not applicable.

	independent data check. Total net change in long lived and medium lived wood products was traced from harvest records through the 1605(b) method and confirmed correct for input.	and the PD and confirmed followed.	
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The methods and formulae set out in the PD for calculating baseline emissions, project emissions, and leakage were followed with the exception of the PD deviations outlined in Section 3.3 of ESI's *Bethlehem Authority Improved Forest Management Project 3rd Verification Report* (dated 25 June 2015), available on the VCS website.

The total end of the 2016 monitoring period carbon stocks in all pools (i.e. above-ground biomass, dead wood, and wood products) resulting from carbon stock changes of 6,109 MtCO₂e were correctly quantified as 2,359,078 MtCO₂e.

Uncertainty was assessed as required. The verification team reconfirmed the statistics from the 2013 inventory independently to confirm the accuracy of the reported precision and confirmed no confidence deduction was required. Analysis of project inventory data used appropriate formulas, conversions, and parameters, supported by scientific literature. Where ranges of parameters exist, or other types of formulaic uncertainty, appropriately conservative values were used in data analysis.

In conclusion, the quantification methods for GHG emission reductions and removals have been performed correctly and in accordance with the validated PD and VM0003 v1.1.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

During this verification assessment, the evidence provided by the project proponent was more than sufficient in both quantity and quality to support the determination of GHG emission removals reported by the project. Throughout the verification, the project proponent demonstrated a commitment toward conservativeness and took all measures appropriate to ensure the reliability of evidence provided.

The threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions and/or removals was met for this project as defined in the Verification Sampling Plan. Materiality is a concept that errors, omissions and misrepresentations could affect the GHG reduction assertion and influence the intended users (ISO 14064-3:2006). As defined by VCS Version 3, the materiality will be 5%.

The evidence provided to determine emission reductions reported in the MR included values, notations, units and sources. This evidence has been cross-checked with supplied emission reduction calculation spreadsheets and a comprehensive GIS dataset. The procedure for data recording, transfer and final transposition was also verified and found to be in compliance with the monitoring plan outlined in the PD. The verification team confirmed through cross checks that adequate monitoring mechanisms are in place where the required parameters need to be monitored.

Interviews conducted (oral evidence) are outlined in Section 2.3 above, and the final documents received from the Project Proponent supporting the determination of GHG removals can be viewed in Appendix A.

4.4 Non-Permanence Risk Analysis

The AFOLU Non-Permanence Risk Tool (v3.3 19 October 2016) was used by the Project Proponent to assess overall project risk. The verification team reviewed the Non-Permanence Risk Report v3.0 provided with the verification supporting documentation and confirmed that the Project adheres to the requirements set out in the VCS AFOLU Non-Permanence Risk Tool. Each risk factor was thoroughly assessed for conformance. Any identified NCR and/or CL findings related to the AFOLU Non-Permanence Risk Tool/Report are presented in Appendix B. The final score was calculated to be 8%, as such; the minimum 10% is utilized. A brief review of each factor is found in the table below:

Risk Factor	Rationale & Quality	Conclusion
Internal Risks		
Project Management	A) Species planted- will not be extensive and all species planted will be native or proven to be adapted to the site. B) No history of illegal activities exists in the region C) The management team has significant experience conducting forest carbon projects and possesses the skills necessary to successfully undertake all project activities. D) The project's Adaptive Management Plan outlines the various processes associated with addressing issues to forest health on Bethlehem Authority lands.	A risk rating of -4 is appropriate given the rationale provided and all statements made are substantiated.
Financial viability	The verification team reviewed the support documentation provided by the Project Proponent and found all calculations and assertions correct. The redacted "Confidential Purchase Agreement" was reviewed by verifiers and VCUs were confirmed to be sold at an appropriate rate per VCU. Breakeven occurred following the sale of the credits issued from the 2012 reporting period. Thus, the current monitoring year financial analysis indicates that sufficient funding has been received from previous VCU vintages to cover 64% of breakeven costs.	A risk rating of 1 is appropriate given the rationale provided and all statements made are substantiated.

Opportunity Cost	Baseline NPV was confirmed to encompass all 100 years of the crediting period and calculations performed are correct.	A risk rating of 0 is appropriate given the rationale provided.
Project Longevity	The project is without legal agreement or requirement to continue the management practice and this criterion is met.	A risk rating of 4 is appropriate given the rationale provided.
Total Internal Risks		1
External Risks		
Land Tenure	The risk report appropriately states "No disputes over land tenure or ownership exist on the project area."	A risk rating of 0 is appropriate given the rationale provided.
Community Engagement	As no households are located within the project area this criterion is not applicable.	A risk rating of 0 is appropriate given the rationale provided.
Political Risk	The average World Governance Indices (WGI) score for the United States, based on the WGI's six governance categories, for 2011-2015 = 1.24.	A risk rating of 0 is appropriate given the rationale provided.
Total External Risks		0
Natural Risks		
Natural Risk	Significance of fire is minor in this part of USA and the likelihood is every 25 to 50 years. Beech bark disease, gypsy moth, and hemlock woolly adelgid have been sporadically present within the project region since the early 1980s. Throughout the project inventory, notes were taken at high conservation value plots defining plot condition in relation to forest stressors. Sites of concern will be regularly monitored to promote improved health and insure conditions do not worsen. As is stated in the project Forest Management Plan, an adaptive approach involving the use of FSC approved pesticides will be implemented to prevent pest/disease outbreak. A score of 5 is reasonable given the high risk of pests and disease in the project area.	A risk rating of 2.75 is appropriate given the rationale provided and all statements made are substantiated.

Total Natural Risks	2.75
Overall Risk Rating = 8%	

In summary, project proponents have accounted for risk factors in a reasonable manner and have reached an overall risk rating that encompasses all risks of non-permanence. The project has applied the minimum risk rating of 10%. As required, risk will be reassessed and given risk scores at each verification period.

5 SAFEGUARDS

5.1 No Net Harm

No negative environmental impacts are expected as the project continues to hold Forest Stewardship Council (FSC) certification which requires a comprehensive environmental impact review. As stated in Section 5 of the validated PD, “forest management practices on the project area would maintain, enhance, or restore ecological functions in support of healthy forest regeneration/succession and encourage genetic, species, and ecosystem diversity.”

5.2 Local Stakeholder Consultation

Stakeholder consultation is a regular component for the project proponent, the Bethlehem Authority as it conducts monthly public meetings. As the project underwent validation in 2013, regular stakeholder outreach is not required following Section 3.17.2-3.17.4 of the VCS Standard v3.6.

6 VERIFICATION CONCLUSION

After review of all project information, procedures, calculations, and supporting documentation, ESI confirms that the monitoring conducted by the project proponent, along with the supporting Monitoring Report, are accurate and consistent with all aforementioned VCS criteria, the validated PD, and the selected methodology (VM0003, v1.1). ESI confirms that the *Bethlehem Authority Improved Forest Management Project Monitoring Report* (v3.0 dated 31 May 2017) has been implemented in accordance with the validated PD.

ESI confirms all verification activities, including objectives, scope and criteria, level of assurance, monitoring and project documentation adherence to VCS Version 3 (and all associated updates), as documented in this report are complete. ESI concludes without any qualifications or limiting conditions that *Bethlehem Authority Improved Forest Management Project* meets the requirements of VCS Version 3 and all associated updates for the fifth monitoring period.

The GHG assertion provided by the Project Proponent and verified by ESI has resulted in the GHG emission reduction or removal of 14,728 tCO₂ equivalents by the project during the fifth monitoring/verification period (01 January 2016 – 31 December 2016). This value is gross of the 10% (1,841 tCO₂ equivalents) buffer withholding based on the non-permanence risk assessment tool.

Verification period: From 01 January 2016 to 31 December 2016

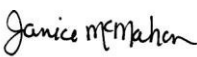
Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)*
5/29/2012-12/31/2012	-5,112	25,480	6,119	22,027
1/01/13-12/31/13	-10,821	24,306	7,025	24,589
1/01/14-12/31/14	-12,301	25,508	7,562	26,466 ⁵
1/01/15-12/31/15	-12,301	33,987	9,258	32,402
1/01/16-12/31/16	-12,301	6,109	3,682	12,887
Total	-52,836	115,390	33,646	118,376

*Note 10% risk deduction accounted for.

⁵ Note 3rd verification/reporting period value reflects previously reported values and not new results as result of fixing quantitative error as described in Section 4.1 of this report.

Submittal Information

Report Submitted to:	Verified Carbon Standard Association 1730 Rhode Island Ave. NW, Suite 803, Washington, D.C. 20036 Blue Source LLC 1935 E. Vine Street, Suite 300 Murray, UT 84121
Report Submitted by:	Environmental Services, Inc. -Corporate Office 7220 Financial Way, Suite 100 Jacksonville, Florida 32257
ESI Lead Validator Name and Signature	 Eric Jaeschke Lead Verifier
ESI Division Regional Technical Manager Name and Signature	 Janice McMahon Vice President and Forestry, Carbon and GHG Division Regional Technical Manager
Date:	28 June 2017

EJ/JM/nrh/VO13051.03-Bethlehem VCS Verification Report Final(v1.1) _20170628
K pf 06/28/17f

APPENDIX A – DOCUMENTS RECEIVED/REVIEWED

Documents received 17 April 2017

- Non-permanence_Risk_Report_2016.docx
- Monitoring_Report_2016.docx
- Bethlehem_2016_Vintage_Verification
 - o __MACOSX
 - __MACOSX\confidential redacted credit sales agreements
 - Previous Redacted Sales Agreement
 - o ._4 Confidential Purchase Agreement.pdf
 - Easement
 - ._Conservation Easement .pdf
 - FSC
 - ._The Nature Conservancy FSC FM cert.pdf
 - ._Bethlehem FSC certificate letter.pdf
 - Management Plan
 - ._BA Adaptive Management Plan.docx
 - Risk tool docs
 - Invoices for Project Expenses
 - o ._7 Nature Conservancy invoices to Woodland_Mgmt.pdf
 - o ._1 Index of Covered Expenses.xlsx
 - o ._2 Bethlehem Inventory SIG Contract .pdf
 - o ._3 SIG paid invoices.pdf
 - o ._4 Third Party Forester Invoice .pdf
 - o ._5 Rainforest Alliance Contract.pdf
 - o ._6 Rainforest Alliance invoices.pdf
 - o 2016 Harvests
 - PermPlots_Tally_Sheet_2016 Harvest Remeasured Plots.xlsx
 - BA_Treatment_History_2016.dbf
 - 2016 Harvests by Stand and Strata.xlsx
 - BA Files
 - BA_Treatment_History_2016.xml
 - BA_Treatment_History_2016.dbf
 - BA_Treatment_History_2016.shx
 - BA_Treatment_History_2016.shp
 - BA_Treatment_History_2016.prj
 - BA_Treatment_History_2016.sbn
 - BA_Treatment_History_2016.sbx
 - 2016_Harvests\Plantations 1E 2E 3E 7E 9E
 - WC 1E 2E 7E Volume Value Estimates.xlsx
 - WC 2C Shelterwood
 - WC 2C Shelterwood\WC 2C Reconciliation 2016 Portion.xlsx
 - Stand Table Wild Creek 2C TS.xlsx
 - WC 3B Shelterwood
 - WC 3B Shelterwood Volume Value.xlsx
 - WC 3B Shelterwood Volume Value v2.xlsx
 - WC 17D
 - WC 17D Reconciliation.xlsx
 - WC 17D Volume Value Estimates.xlsx
 - WC 23A

- WC 23A Final Volume Value Estimates_CorrectedRRW.xlsx
- o Blue Source TNC Project List
 - BlueSoucre_TNC_ProjectList.xlsx
- o Change Log
 - Bethlehem 5th verification change log.docx
- o Confidential Redacted Credit Sales Agreements
 - TNC Blue Source Amendment FINAL 9 30 13 Mutually Executed_Redacted.pdf
 - Previous Redacted Sales Agreement
 - Previous Redacted Sales Agreement\4 Confidential Purchase Agreement.pdf
- o Easement
 - Conservation Easement .pdf
- o FSC
 - Bethlehem FSC certificate letter.pdf
 - The Nature Conservancy FSC FM cert.pdf
- o FVS
 - Bethlehem_LetGrow_20170317.bat
 - Bethlehem_Keywords.kcp
 - Bethlehem_LetGrow_20170317.key
 - suppose.loc
 - Bethlehem_Input_20170317.mdb
 - Bethlehem_output_20170320.accdb
 - Harvested plot data for FVS_Treelnit table.xlsx
 - Bethlehem_LetGrow_20170317.out
 - Bethlehem_LetGrow_20170317.sum
 - Bethlehem_LetGrow_20170317.trl
- o General_Spatial
 - BA_GoogleEarth.kmz
 - Permanent Plots
 - 14 Various related files
 - Project boundary
 - 15 Various related files
- o Leakage Calcs
 - Leakage Calculations 2016.xlsx
- o Management Plan
 - Confirmation of Forest Management Activities Letter 2015.pdf
 - BA Adaptive Management Plan.docx
 - Bethlehem Authority Forest Management Plan 11july2012.pdf
- o Modeling Walk-through
 - Bethlehem RP5_Verification_SIG_Modeling_20170412.pdf
- o NCRs
 - Empty
- o Project Description
 - Project Description.pdf
- o Risk Tool Docs
 - Worldwide_Governance_Indicator_calcs.xlsx
 - 2016_Q1_Pen_Pulp_Price.pdf
 - 2016_Q2_Pen_Pulp_Price.pdf
 - 2016_Q3_Pen_Pulp_Price.pdf
 - 2016_Q4_Pen_Pulp_Price.pdf
 - Bethlehem PA Woodlands Timber Prices.xlsx

- Bethlehem_2016_Vintage_Verification - Shortcut.Ink
RiskTool_Financials 2016.xlsx
- TNC Blue Source Amendment FINAL 9 30 13 Mutually Executed_Redacted.pdf
- Invoices for Project Expenses
 - 1 Index of Covered Expenses.xlsx
 - 2 Bethlehem Inventory SIG Contract .pdf
 - 3 SIG paid invoices.pdf
 - 4 Third Party Forester Invoice .pdf
 - 5 Rainforest Alliance Contract.pdf
 - 6 Rainforest Alliance invoices.pdf
 - 7 Nature Conservancy invoices to Woodland_Mgmt.pdf
- o VCU Calcs
 - VCU Calculations Vintage 2016 20170315.xlsx
- o Wood_Product_Calcs
 - Table4_GTR-NE-319.pdf
 - 2016_Verification_Wood_Products_20170322.xlsx
 - Wood_Product_Calcs\HWP Input.xlsx

Documents received 31 May 2017

- NCR_Response_RobinWildermuth_5_30_17.txt
- ESI Property Sale Disclosure Letter to Blue Source 053117.pdf
- Scale Slips 9E sample.pdf
- Plot 110 5 27 2017 Uncut (1).JPG
- Plot 110 5 27 2017 Uncut (2).JPG
- 051_03_Beth_5th_ver_NCRs_R1_FINAL_2017-05-31.xlsx

Documents received 01 June 2017

- Monitoring_Report_2016_updated53117.docx

Documents received 09 June 2017

- Monitoring_Report_2016_updated53117.docx
- Non-permanence_Risk_Report_2016_updated53117(v1).docx

APPENDIX B – NCRs/CLs/OFls

Item Number	1
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6 (Section)	3.16 MONITORING
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6 (Description)	3.16.6 The monitoring report describes all the data and information related to the monitoring of GHG emission reductions or removals. The project proponent shall use the VCS Monitoring Report Template and adhere to all instructional text within the template.
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	MR General
ESI Findings	Project is using the VCS Monitoring Report template and all sections of the MR are completed using Arial 10pt, black, regular (non-italic) font as required by the template. It was noted however that the contact person for ESI is incorrect.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please correct the contact person and information in Section 1.4 of the MR.
Round 1 Response from Project Proponent (31 May 2017)	ESI's project contact has changed, Eric Jaeschke should be the contact.
ESI Findings - Round 1	The contact information is now correct in Section 1.4 of the MR. The item is addressed.
Item Number	2
VCS AFOLU Requirements 19 October 2016, v3.5 (Section)	3.6 LEAKAGE MANAGEMENT, MITIGATION AND ACCOUNTING

VCS Standard Version 3 Requirements Document 19 October 2016, v3.6 (Description)	3.6.1 The potential for leakage shall be identified, and projects are encouraged to include leakage management zones as part of the overall project design. Leakage management zones can minimize the displacement of land use activities to areas outside the project area by maintaining the production of goods and services, such as agricultural products, within areas under the control of the project proponent or by addressing the socio-economic factors that drive land use change. Activities to mitigate ecological leakage in WRC projects may include the establishment of a leakage management zone inside the project boundary.
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	MR Section 2.1
ESI Findings	From MR: "The applicability conditions of VM0003 and the VCS standard prohibit any activity shifting leakage as result of the implementation of an IFM project. As the Bethlehem project area is the only forestland owned/managed by BA, this requirement is automatically met." See also: VM0003, Section 8.6.1. At the previous verification, the VVB reviewed maps provided, "Bethlehem_Authority_Tunkhannock_Parcel_Map_ExhibitA1.jpg" and "Bethlehem_Authority_WildCreek_Parcel_Map_ExhibitA2.jpg." These maps sufficiently depicted the parcels included in the project area at that time. However, in 2016 the Bethlehem Authority may have acquired additional lands.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please clarify and attest as to whether the Bethlehem Authority acquired any new lands during the monitoring period.
Round 1 Response from Project Proponent (31 May 2017)	Bethlehem Authority has not acquired any new lands during the monitoring period. See: ESI Property Sale Disclosure Letter to Blue Source 053117.
ESI Findings - Round 1	In response to the finding an official letter was drafted by Stephen Repasch, Executive Director of the Bethlehem Authority which clarifies and attests that the Bethlehem Authority has not acquired any new lands during the monitoring period. This evidence is sufficient to address this leakage requirement. The item is addressed.

Item Number	3
VCS VM0003 v1.1 (20 November 2012) Methodology for Improved Forest Management Through Extension of Rotation Age (IFM ERA) (Section)	8.5.1.3 Wood Products
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6 (Description)	The Wood Products pool is calculated through the following general steps for each harvest period h:
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	BA_Treatment_History_2016.shp; CFI_FVS_PERM_PLOTS/shp
ESI Findings	Verifiers reviewed materials submitted as part of harvest record keeping for project accounting and verification purposes. The 4 re-inventoried plots were confirmed to reside in 2016 harvests per the harvest area shapefile. Plot 110 was noted as being very close (~10') to the harvest area boundary for stratum 7 - 7.9 acre thinned area, "9E." Verifiers were unable to locate additional evidence or discussion as to whether trees from this plot were harvested.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please confirm that plot 110 in entirety is outside of the 2016 harvest areas, providing evidence as needed to support assertions.
Round 1 Response from Project Proponent (31 May 2017)	Plot is entirely outside the 2016 harvest. See: NCR_Response_RobinWildermuth_5_30_17; Plot 110 5 27 2017 Uncut (1); and Plot 110 5 27 2017 Uncut (2)
ESI Findings - Round 1	In response to the finding the proponent provided an email from the project's forester and photos of plot 110. The email detailed how the harvest boundary was actually moved further away from plot 110 due to pulpwood market conditions. Further, date stamped photos were taken of the plot demonstrating no harvesting in the vicinity. Collectively, this evidence is sufficient to demonstrate that plot 110 did not experience harvesting during the reporting period and that all harvest plots have been appropriately accounted for for the inventory update process. The item is addressed.

Item Number	4
VCS VM0003 v1.1 (20 November 2012) Methodology for Improved Forest Management Through Extension of Rotation Age (IFM ERA) (Section)	Method 1: 1605b Method
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6 (Description)	Where: EXCWP,ty The summed stock of extracted biomass carbon from within the project area by wood product disposition (hardwood sawnwood/hardwood pulpwood/softwood sawnwood/softwood pulpwood) ty; t C Vex,h,s p,j, The volume of timber extracted from within the project area during harvest h by species j and wood product disposition ty; m3 Dj Basic wood density of species j; t d.m. m-3 CFj Carbon fraction of biomass for tree species j; t C t-1 d.m. (IPCC default value = 0.5 t C t-1 d.m.) h 1, 2, 3 ...number of harvests since the start of the IFM project activity j 1, 2, 3 ... SPS tree species in the baseline scenario s p Wood product disposition – defined here as sawnwood or pulpwood
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	2016 Wood Products worksheet
ESI Findings	Species specific wood densities are being utilized for all species and derived from Table 4-GTR-NE-319. MBF and green tons merch volumes are converted to cubic feet using conversion factors sourced from the American Forest and Paper Association. However, given that the harvest volumes are provided in spreadsheet format, the verifier randomly selected the Wild Creek 3E harvest as subject for the full scale slip/mill receipt review. This additional documentation is needed for the verification team to reach reasonable assurance for this desktop verification review. MBF and green ton volumes are converted to cubic feet using conversion factors sourced from the American Forest and Paper Association. The log rule used is Scribner.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please provide scaling or mill receipts for the Wild Creek 3E harvest during the 2016 monitoring period to substantiate harvest amounts.
Round 1 Response from Project Proponent (31 May 2017)	Sample scale slips and email explanation provided. See NCR_Response_RobinWildermuth_5_30_17 and Scale Slips 9E sample.

ESI Findings - Round 1	Scale slips for timber sale 9E were provided in response to this finding in addition to an email explanation (same email as Item #3) from the on-site forester. The verifier was able to observe the process for harvest tracking from mill receipts to reconciliation. Harvest tracking was performed in a similar manner as previous monitoring periods. The verifier is reasonably assured that harvest tracking methods are being performed consistently. The item is addressed.
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Item Number	5
VCS VM0003 v1.1 (20 November 2012) Methodology for Improved Forest Management Through Extension of Rotation Age (IFM ERA) (Section)	8.6.1 Leakage due to Activity Shifting
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6 (Description)	Where: PMLFT is equal ($\pm 15\%$) to PMPi, LFME = 0.4 PMLFT is $> 15\%$ less than PMPi, LFME = 0.7 PMLFT is $> 15\%$ greater than PMPi, LFME = 0.2
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	PD section 3.3, MR section 4.3, Leakage Calculations 2016.xls
ESI Findings	Since the proportion of average merchantable above-ground biomass by forest type is greater than the weighted average of merchantable aboveground biomass by stratum, the appropriate leakage factor is 0.2. However, the percent difference is incorrectly reported in Section 2.1 of the MR as compared to the leakage calculations worksheet. The correct leakage factor was applied.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please report the correct percent difference between PMLFT and PMPi in Section 2.1 of the MR.
Round 1 Response from Project Proponent (31 May 2017)	Percent difference corrected from 17% to 12%.
ESI Findings - Round 1	This reporting error was confirmed fixed in Section 2.1 of the MR. The item is addressed.

Item Number	6
VCS AFOLU Non-Permanence Risk Tool, Version 3.3 19 October 2016 (Section)	1 Introduction and Scope
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6 (Description)	This document shall be updated from time-to-time and readers should ensure that they are using the most current version of the document.
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	Non-permanence_Risk_Report_2016.docx; VCS Non-Permanence Risk Report Template, v3.2-19Oct2016.doc
ESI Findings	The current version of the tool is now v3.3, 19 October 2016. The main updates were not applicable to the project. VCS updated the risk report template to v3.2 and currently the project is using the prior template v3.1. The verifier notes that the template revisions are minor but VCS guidance requirements require use of the current template.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please update the risk report template to the current version v3.2. Also, please be sure to follow all VCS template guidance language ("Blue Source LLC shouldn't be bolded on page 1, font in opportunity cost section).
Round 1 Response from Project Proponent (31 May 2017)	Updated to current version of VCS AFOLU Non-Permanence Risk Tool v3.3. Formatting edited: Blue Source LLC is no longer bolded on page 1, font in opportunity cost section is corrected.
ESI Findings - Round 1	The revised Risk Report was reviewed in response to this finding. All elements were confirmed fixed appropriately. No further action is needed. The item is addressed.

Item Number	7
VCS AFOLU Non-Permanence Risk Tool, Version 3.3 19 October 2016 (Section)	Table 3 Opportunity Cost
VCS Standard VCS Version 3 Requirements Document 19 October 2016, v3.6	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated

(Description)	
Applicability to the Project (Y or N/A)	Y
Requirement Met (Y, N, Pending)	Y
Evidence Used to Assess Conformance	Non-permanence_Risk_Report_2016.docx
ESI Findings	Discount rate for this verification could not be confirmed to be derived from the average real 10-year US treasury rate over the last decade. Further, the discount rate applied differs from the value reported within the risk report.
Round 1 NCR/CL/OFI (26 May 2017)	CL: Please clarify the source of the NPV discount rate, ensuring reporting is in line with calculations.
Round 1 Response from Project Proponent (31 May 2017)	Discount rate and NPV from Project Activities updated in the Nonpermanence_Risk_Report_v3.3. Discount rate based on average real 10year US treasury rate over the last decade (3.28%).
ESI Findings - Round 1	The verification team confirmed that the discount rate is appropriate and applied and reported correctly. No further action is needed. The item is addressed.