VALIDATION & VERIFICATION REPORT OF THE REFORESTATION OF DEGRADED FOREST RESERVE AREAS IN GHANA, WEST AFRICA PROJECT

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Summary:

Currently, Miro Forestry Developments Limited (Miro Forestry) has over 10,000 hectares established in Ghana with five species: Eucalyptus, Teak, Acacia, Gmelina and Corymbia in the Boumfoum, Chirimfa and Awura Forest Reserves. The company aims to produce sustainable timber products including plywood, rotary veneer, poles, sawn timber, and wood biomass chips.

The proposed AR-VCS project involves reforestation activities in 3,871 hectares of highly degraded forest reserves. The project forecast an average expansion of 1,500 hectares per year for six years more until reaching approximately 14,000 hectares of holdings in 2025 through the addition of new project areas. The Chirimfa and Awura Forest Reserves were once productive reserves covered with high, -elevation semi-deciduous forest.

The project proponent, Miro Forestry, has land lease agreements and a benefit share agreement with traditional landowners and the Forestry Commission of Ghana to restore the degraded forest reserves into productive planted forests. This lease construction is part of the presidential policy to restore degraded forest reserves in Ghana, which is a strong policy instrument demonstrating the commitment of the Ghanaian government to conserve, restore and promote the sustainable use of forest resources in the country.

The purpose of the validation and verification was the independent evaluation of the project's compliance with the VCS Standard v4.0 and the assessment of the ex-post monitored anthropogenic GHG emissions reductions and/or removals that have occurred as a result of the project's activities. The process was performed through a combination of desk review, remote interviews and communications with relevant personnel and direct beneficiaries.

During the validation and verification 2 CLs and 4 CARs were reported. All these issues where appropriately closed by means of corrections, more clear explanations, and other supported documents.

AENOR carried out a final validation report and deems with reasonable level of assurance that the project complies with all the validation criteria for VCS. The assessment team has no restrictions or uncertainties with respect to the compliance of the project with the validation criteria. Hence, the audit team concludes that the GHG emissions reductions or removals, for the lands included in the project boundary, have been quantified in accordance with VCS rules. AENOR can confirm that the expected total GHG benefit is estimated in 58,224,709 tCO_2e for the 30 years of the crediting period. However, according to the standard requirements the Long-term Average was applied and as a result, the project expects to reduce 1,940,824 tCO_2e during the entire crediting period. Thus, the estimated annual average GHG emission reductions/removals of 64,694,1 tCO_2e for the crediting period and the estimated net GHG emissions reductions/removals of 220,414 tCO_2e achieved during the monitoring period are accurate and free of material errors.

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1 INTRODUCTION

1.1 Objective

The purpose of the validation and verification audit activity was to conduct an independent assessment of the project to determine whether the project complies with the validation and verification criteria as set out in the guidance documents listed in Section 1.2 of this report, including the monitoring procedures and that the GHG emission reductions and removals reported in the monitoring report are materially accurate.

1.2 Scope and Criteria

The scope of the validation and verification audit is to validate and verify the emissions reductions of the proposed project activity in Ghana against the Verified Carbon Standard, the identified methodology and associated tools, for the crediting period from 24-March-2016 to 30-June-2045 and the first monitoring period from 24-March-2016 to 01-November-2020.

The objectives of this audit included a validation of the projects estimated emission removals and the verification of the achieved emissions removals with the Verified Carbon Standard requirements and any additional requirements of VCS AFOLU projects, besides the assessment of the additionality and the non-permanence risk assessment report.

The scope was defined as follows:

- The project and its baseline scenarios.
- The physical infrastructure, activities, technologies and processes of the project.
- The GHG sources, sinks and/or reservoirs those are applicable to the project.
- The types of GHGs that are applicable to the project.
- The project crediting period.
- The project first monitoring period.

In accordance with Section 4.1.8 of the VCS Standard, the criterion for validation and verification was the VCS Version 4, including the following documents:

- VCS Standard v4.1
- VCS Program Guide v4.0
- VCS AFOLU Non-Permanence Risk Tool v 4.0

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

1.3 Level of Assurance

The assessment was conducted to provide a reasonable level of assurance of conformance against the defined audit criteria and materiality thresholds within the audit scope. Based on the audit findings, a positive evaluation statement reasonably assures that the project GHG assertions are materially correct and is a fair representation of the GHG data and information.

All the versions of the validation and verification report were subjected to an independent internal technical review before being submitted to the client to confirm that all validation activities had been completed according to the pertinent AENOR instructions required. The technical review was performed by a technical reviewer(s) qualified in accordance with AENOR´s qualification scheme for VCS validation and verification.

1.4 Summary Description of the Project

Miro Forestry Developments Limited (Miro Forestry) has over 10,000 hectares established in Ghana with five species: Eucalyptus, Teak, Acacia, Gmelina and Corymbia in the Boumfoum, Chirimfa and Awura Forest Reserves. The company aims to produce sustainable timber products including plywood, rotary veneer, poles, sawn timber, and wood biomass chips.

The commercial plantation project area is located in Ghana's Ashanti region, in the Asante Akim North, Sekyere East and Sekyere West districts. Miro Forestry was established in 2007 under Ghanaian law. It has been certified according to the principles and criteria of the Forest Stewardship Council (FSC) since January 2010.

The project proponent, Miro Forestry, has land lease agreements and a benefit share agreement with traditional landowners and the Forestry Commission of Ghana to restore the degraded forest reserves into productive planted forests. This lease construction is part of the presidential policy to restore degraded forest reserves in Ghana.

The proposed AR-VCS project involves reforestation activities in 4,196.16 hectares of highly degraded forest reserves. The project forecast an average expansion of 1,500 hectares per year for six years more until reaching approximately 14,000 hectares of holdings in 2025 through the addition of new project areas.

This is a project under the category of Afforestation Reforestation and Revegetation (ARR). The project crediting period is 30 years (24-March-2016 to 30-June-2045). The main project activities were defined as Management Systems, Planning (land mapping and planning), silviculture (nursery, slash management, land preparation, marking and pitting, planting, survival survey and blanking, weed control, fertilizing, pruning, etc.), Forest Protection (Fire, Pest, and Disease control), Harvesting (forest Roads, Thinning and Singling/stem reduction, Thinning).

The project generates GHG removals by the plantation of selected species such as *Eucalyptus pellita*, Tectona grandis, *Corymbia citriodora, Acacia mangium*, and *Gmelina arborea*. Other commercial species the Company is trialing in the project area include Pine, Cedrela and other timbers suitable for short to

mid-rotation plantations. Due to the low percentage and representativity, these species are grouped later like “other species”. On average, the project estimates to remove 64,694 tCO2e annually and 1,940,824 tCO2e during the entire project life.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

The validation and verification were performed through a combination of document review, and remote interviews with relevant personnel, as discussed in Sections 2.2 through 2.4 of this report. At all times, the project was assessed for conformance to the criteria described in Section 1.2 of this report. As discussed in Section 2.5, findings were issued to ensure that the project was in full conformance to all requirements.

The Reforestation of Degraded Forest Reserve in Ghana will be assessed according to the requirements and guidance set by the following documents:

- VCS Program Guide v4.0
- VCS Standard v4.1
- AFOLU Non-Permanence Risk Tool, v4.0
- Large-scale Consolidated Methodology: AR - ACM0003 A/R Afforestation and reforestation of land except wetlands (Version 02.0)
- Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (Version 01).
- Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities (Version 04.2)
- Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities (Version 01.1.0)

The following documents will be used as reference during the audit process, among other:

- 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
- 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands
- Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003).
- Good Practice Guidance and Uncertainty Management in National GHG Inventories (2000).
- Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) REDD+ Source Book (2015)
- GFOI Methods and Guidance Documents (2013&2016) and supplementary modules
- ISO 14064-3:2019 Part 3: Specification with guidance for the verification and validation of greenhouse gas statements (2019).

A project specific sampling plan was developed to guide the validation and verification auditing process to ensure efficiency and effectiveness. The purpose of the sampling plan was to present a risk assessment for determining the nature and extent of the validation and verification procedures necessary to ensure the risk of auditing error was reduced to a reasonable level. The validation and verification sampling plan methodology was derived from all items in our auditing process stated above. Specifically, the sampling plan utilized the VCS guidance documents and ISO 14064-3. Any modifications applied to the validation and verification sampling plan were made based upon the conditions observed for monitoring to detect the processes with highest risk of material discrepancy.

The validation activities in which risks were assessed were the evaluations of the applicability, baseline scenario, additionality, leakage, non-permanence risk analysis, monitoring system, safeguards, etc. In case of the verification, the accuracy of GHG emission reduction and removal calculations was reviewed, according to the monitoring results, as well as the quality of the related evidence.

Based on these analyses and considering the requirements of the GHG program used, the following sampling was carried out.

The key Project information to review can be summarized as follow:

- Project proponent, developers/management team, local team onsite
- Stakeholders' consultation process & Public Comment Period
- Project rights and legal requirements
- Project communication
- Financial issues, Financial sustainability.
- Project conflicts, barriers, or difficulties.
- Risk to local stakeholders. NPRR and NPR tool used.
- Benefit permanence (mid and long term)
- Deforestation drivers in the project site
- Additionality assessment
- Methodology used and deviations
- Baseline scenario, project scenario, leakage
- Ex-ante Quantification of emission reductions or removals
- Monitoring plan. Monitoring procedures. Monitoring Team & Equipment
- Review of operation and measurement records. Controls established to detect and correct any error or omission in monitoring parameters
- Identification of deforested areas during monitoring period
- Ex. Post Quantification. Carbon calculations. Estimates and assumptions for determining GHG data. Remote sensing.
- Project activities conducted during the monitoring period (reporting, results, concordance with plan as per PDD, etc.)

The sampling aims to check the quantity and type of evidence below:

- To carefully review the PD & MR and supporting documentation for conformance to the verification criteria.
- To examine the baseline data gathered from the determined baselines for the project's region, spreadsheets used to enter, and compile information required by the methodology

- To reproduce 100% of sheets in the PD & MR and the other spreadsheets for the project description, or for the monitoring period (PAAs) crosschecking with used methodology requirements (CDM methodology: AR - ACM0003 A/R Afforestation and reforestation of land except wetlands (Version 02.0).).
- To check 100% the project boundary and land cover classification and changes in the project area for the reference and monitoring period using the GIS database.
- To reproduce the GHG emissions reductions calculations (ex-ante & ex-post) presented in the spreadsheet and crosscheck with the Project Description & Monitoring Report.
- To verify 100% the carbon stock changes, and the land used classes in the project area for the reference and monitoring periods.
- To examine the monitoring of the carbon variables. Due to current sanitary crisis circumstances, a testimonial evidence in form of demonstration video of the inventory activities will be provided by the PO (in field carbon inventory: data collection, equipment used, calibration, team members skills and knowledge, data control & Quality)
- To carefully review the NPRR and supporting documentation for conformance to the verification criteria and consistency with the Project Description.
    - 100% verify Non-Permanent Risk Report results using the NPRR tool and considering the standard requirements.

The carbon stock changes, and the land used classes in the project area were also 100% verified and crosschecked with validated values. For data provided for the reference region, AENOR requested onsite samples of data.

AENOR carried out a deep and meticulous review of the spreadsheets to verify the correct application of the methodology (formulae, equations, etc.) and checked that data required calculating the GHG removals were appropriately provided. Based on the assessment carried out, AENOR confirms with a reasonable level of assurance that the claimed emission reductions are free from material errors, omissions, or misstatements.

AENOR confirms that sufficient evidence was presented for the reported net anthropogenic GHG emission reductions and that there is a clear audit trail that contains the evidence and records that validate the stated figure in this verification report since:

- Sufficient evidence available: The project participant has provided the 100% of data used in the calculations to achieve the final amount of GHG emission reductions reported.
- Nature of evidence: The raw data were collected from reliable sources. They are detailed in the project documents and have been provided to the verification team and were checked during the interviews.
- Cross-checked evidence: AENOR cross-checked the collected information through interviews with stakeholders and reproducing calculations.

Hence, AENOR confirms that the stated figures in the Project Description and Monitoring Report are correct and confirms that is able to certify net anthropogenic GHG removals based on verifiable and reliable evidence.

2.2 Document Review

The Joint Project Description and Monitoring Report submitted by the Project Proponent (PP) was reviewed against the approved methodology and against VCS requirements. Additional background documents related to the project design, baseline and additionality were also made available before and during the remote audit process, along with the non-permanence risk report.

Other documents reviewed included data from monitoring, carbon rights contracts, management agreements, maps and aerial images, monitoring and grievance SOPs, biomass and carbon calculation spread sheets, and responses to Corrective Action Requests (CARs) and Clarifications (CLs). All documents were provided digitally to the audit team.

To address the corrective actions and clarification requests that arose from the desk review and remote process, the PP revised the project description document version 1 (dated June 2020) and developed a final version 2 dated on 12 May 2021. However, later version to correct small mistakes were sended by the PP until September 2021.

For a listing of all documents received from the client for this verification, please see Appendix 1.

2.3 Interviews

After reviewing the feasibility (restrictions on presential meetings and logistical limitations in the project area) of the initial remote audit plan proposed to the project proponent, it was determined to conduct the following online person-to-person interviews. Further details of the remote audit process are presented in Annex 2 of this document

The dates for the remote process were agreed for the 15th, 16th and 17th February 2021. It was stipulated to carry out the interview sessions from 9 to 15 h (Ghana time), 8 to 14h (CET), 2 to 8 h (Colombian Time). The following table summarizes the main interviews held during the remote process with details of the stakeholder group, name of the respondents, topic treated, means of verification and date.

Stakeholder Group	Name/Role	Topic	Date/ Verification mean
Project Proponent	Andrew Collins MIRO CEO	Project Implementation/ Project Management Systems	04/02/21 Videocall
Representative of the Forestry Commission	Mr. Justice Niyuo. District Manager at Kumawu	Project Involvement/ Approval/	16/02/2021 Phone call
Project Local Management Team	MIRO Project staff: Ernestina Osei-Pepra (Environmental & Compliance Manager)	Project Implementation/ Local Coord/Project consultation & Local participation/Project	15/02/2021 Videocall

Stakeholder Group	Name/Role	Topic	Date/ Verification mean
	Opoku Ntim-Adjei (Social Manager)	communication/Project Risks	
Direct Beneficiaries	FACILITATOR: Opoku Ntim Adjei (Social Manager) 1. Mr. Israel Mortey - Ananekrom 2. Mr. Mathias Nyaata – Bunuso 3. Mr. Aaron Kwadwo Fordjour - Nkujua 4. Mr. Emmanuel Agyei-Boadi - Agogo, also works at the Asante-Akim North District Assembly (district local government office) 5. Mr. Eric Asamoah - Ankamadua, local Assembly member 6. Nana Boakye Yiadom - Agogo Traditional Council	Project Involvement/ Consultation/ Risk-benefits/ Communication	16/02/21 Videocall
Project monitoring team	Project Monitoring Team: Francis Bower Planning Manager Wayne Atherstone (harvesting manager) South Pole Representatives: Maria Fernanda Buitrago, Lina Vanesa Espitia	Soil and Biomass (tree& shrubs) inventories/ Land Mapping and Planning/ Data Control, internal audit and QA/QC	17/02/2021 Videocall
MIRO Project staff and other local participants in the project activities	Gerald Taziwa Senior Forester Dombina, Denis, and other participants in the project activities.	Management Systems / Planning/ Silviculture/ Forest Protection/ Harvesting/ Research	16/02/21 Videocall

2.4 Site Inspections

Due to the exceptional situation caused by the COVID-19 crisis and the travel restrictions established by governments for safety reasons, it was not feasible to carry out a site visit to verify the implementation of projects' activities and monitoring plans.

In accordance with VERRA's COVID-19 Travel Guidance for Projects (dated 18 March 2020). An exemption of the site visit required by the CCB standards, on the ground of the current crisis situation and considering that a reasonable level of assurance is achievable by other means. AENOR as VVB carried out a remote audit that ensured the achievement of the assurance level required by both the VCS and CCB programs.

The remote audit was based on the following auditing techniques:

- Document review and cross checks between the information provided in the MR, the PD and supporting information and evidence provided by the PP.
- Review, based on the selected methodologies, tools and the other applied methodological regulatory documents, of the appropriateness of formulae and accuracy of calculations.
- Telephone, teleconference and/or e-mail interviews with relevant stakeholders and personal responsible for the implementation of project activities and the elaboration of project's documents.
- Cross checks between information provided by interviewees to ensure that not relevant information has been omitted.

The remote audit procedure was agreed with the PP based on available means and safety procedures. Key stakeholders interviewed, details of the testimonials gathered as remote evidence and project activities information reviewed during the remote process are shown in Appendix 2 of this report.

2.5 Resolution of Findings

A total number of 4 CAR and 2 CLs were raised during this validation and verification process. All findings issued by the AENOR audit team for this validation and verification process have been closed. In accordance with Sections 4.1.13 and 4.1.14 of the VCS Standard, all findings issued during the validation and verification process, and the inputs for their closure, are described in Appendix 3 of this report.

Forward Action Requests

No forward action request arose during this validation and verification process.

2.5.1

3 VALIDATION FINDINGS

3.1 Project Details

Project type, technologies and measures implemented, and eligibility of the project

The project is classified under sectoral scope 14 "Agriculture, Forestry and Land Use (AFOLU)". As described in Section A1.1 of the VCS Standard, the project is eligible under the category of Afforestation, Reforestation, and Revegetation (ARR).

3.1.1 The project has been designed as a single instance, non-grouped project. The initiative consists of the establishment of high-quality commercial forestry plantations with short rotation species, for producing sawn timber, poles, plywood, and biomass, for domestic and international markets, and providing environmental, social, and economic benefits to local communities.

This project is eligible, since it avoids the conversion of forest to a non-forest land use, mainly agriculture and grass lands. The project is located in an area of ecological importance due to dry forest which has a special threat under climate change scenarios, with desertification as one of the main consequences. All the activities proposed under this project aim to generate GHG emission reduction and removal.

Project design

This is not a grouped project. The project has been designed to include different project activities that are described in section 1.11. of the Joint PD&MR document.

Project proponent and other entities involved in the project

3.1.2 The project proponent is Miro Forestry Developments Limited company, while Miro Forestry Company Ghana Ltd (MFSL) is the local support company managed by Mito Forestry Developments Limited. This information was crosschecked with supported evidence and the online interview with Mr. Andrew Collins Co-founder and CEO of Miro Forestry Developments Limited.

3.1.3 Swiss Carbon Value Ltd (South Pole) was the project developer entity and collaborated with constant communication with the audit team during the validation and verification process.

The audit team finds that contact and entity information provided in the PD conforms to the VCS requirements.

Ownership

Miro Forestry Developments Ltd. has signed a land lease agreement with traditional landowners and the Government of Ghana for the reforestation of the project area to restore productive forest in the degraded forest reserves. This lease construction and benefit sharing contracts are part of the national policy to

3.1.4

restore degraded forest reserves in Ghana. The company has signed a Land Lease and Benefit Sharing Agreement with the Forestry Commission and other relevant stakeholders for the statutory rights of entry into the Boumfoum Forest Reserve. The terms of this are similar to those of public-private partnership agreements. The Company's current total land holding is 17,983 hectares

Supporting documentation regarding land leases and titles was provided to the audit team to verify the conformance with the VCS standard section 3.6. In addition, the audit team had a phone call with Mr. Justice Niyuo (District Manager at Kumawu) representative of the Forestry Comission of Ghana, who confirmed the ownership of the project.

The audit team has checked the land leases and certificates of titles provided as evidence of the ownership and finds that the PP's project ownership is unconditional, undisputed and unencumbered, in accordance with VCS requirements.

Project start date

3.1.5

The project start date is 24/03/2016, which corresponds to the first activity that leads the GHG removals of the project, date which corresponds to the establishment of the compartment A6 of *E. pellita* for that year. The audit team has checked this information with the submitted records "A6_Proof of Enumeration" and "A6_Tickets proof of planting" and during the remote interview with the local management team, and did not find inconsistences. As supporting document, a print-out from the Microforest system indicates the hiring and the payment of the activities (watering, land preparing) performed before the actual planting in the referenced compartment.

Hence, in opinion of AENOR the start date is considered reasonable and correct based on the VCS requirements for start date established in Section 3.7 of the VCS Standard.

Project crediting period

The crediting period of the grouped project is 30 years-long, from 24-March-2016 to 30-June-2045.

According to Section 3.8.3 of the VCS Standard, the crediting period of AFOLU projects will have a minimum of 20 years and a maximum of 100 years. Therefore, the project activity is in line with the length of the crediting period, and it has the option to renew four more times.

3.1.6

In this regard, AENOR can confirm that PP have developed credible and robust plan for managing and implementing the project over the crediting period in compliance with Section 3.8.4 of the VCS Standard.

Project scale and estimated GHG emission reductions or removals

The project is classified as "project" according to its scale (less than or equal to 300,000 tons of CO_2e per year) since it will remove an average of 64,694 tCO_2e per year during the 30 years of crediting period.

3.1.7

Project location

The Miro Ghana Commercial Plantation project area is located in Ghana's Ashanti region, in the Asante Akim North, Sekyere East and Sekyere West districts. It is composed of a total area of 5,768 ha planted with different species of trees between 2016 and 2019.The proposed project will be implemented in the Awura and Chirimfa Forest Reserves, which is an extension of the existing plantation in the Boumfoum Forest Reserve.

3.1.8

The location of the project area has been presented in GIS and KML files. The coordinates of project area have been provided. During the remote process, AENOR verified the location of the project activity.

Conditions prior to project initiation

Regarding conditions prior to the project initiation, the PD and MR describes in a complete way the climate, hydrology, topography, relevant historic conditions, soils, vegetation, and ecosystems for the areas involved in the project. During the remote audit, AENOR verified that project is being implemented in area which has limited tree cover, and area dominated by wetlands and 'farm bush'.

3.1.9 Project compliance with applicable laws, statutes and other regulatory frameworks

Section 1.14 of the PD and MR provides information related the compliance with the applicable laws, statues and other regulatory frameworks. The main and relevant Laws are detailed, and its enforcement analyzed in the PD and MR. According to the information provided and assessed during the audit process, the project fulfils with laws mentioned in the PD and MR as it could be verified during the desk review and the remote process. Thus, AENOR deems that project complies with applicable laws, statues, and other regulatory frameworks.

3.1.10

Section 1.14 of the PD and MR provides information related the compliance with the applicable laws, statues, and other regulatory frameworks from the local to the national level. The main and relevant Laws are detailed, and its enforcement analyzed in the PD and MR. According to the information provided and assessed during the audit process, the project fulfils with laws mentioned in the PD and MR as it could be verified during the desk review and the remote process. Thus, AENOR deems that project complies with applicable laws, statues, and other regulatory frameworks.

Participation under other GHG programs

GHG emission removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions.

The project has not been registered nor is seeking registration under other GHG program, nor has it been rejected by other GHG program.

3.1.11

Other forms of credit

The audit team has not found evidence that the project has sought or received other forms of environmental credit.

Additional information relevant to the project

Leakage management for AFOLU projects:

The probability of leakage occurring due to people moving inside of the project area is limited, due to the land management policies created by the forestry commission and because most of the land outside the project area is already at a very low baseline for agriculture. This activity is not fixed as fires occur in numerous areas throughout the year.

The project activities are designed to help the community by offering alternative livelihood solutions, predominantly employment. Leakage is not expected to occur in the project area due to the project activities, so it is deemed to be zero.

Therefore, the audit team deems that the project does not displace pre-project agricultural activities (Leakage = 0). Thus, neither a leakage management plan nor leakage mitigation measures are required.

Commercially sensitive information:

No commercially sensitive information has been excluded from the public version of the Pd and MR.

Sustainable development contributions:

Miro Foresty in Ghana aims to have a substantial economic impact in the areas it has operations in through employment, community development and local procurement of supplies, and infrastructure. The company has also been working with the most relevant entities (Forestry Commission, Ministry of Lands and Natural Resources and the Environmental Protection Agency) regarding sustainable development in the country.

Economic diversification, managing natural resources, accelerating human development and strengthen social protection systems, labour and employment and Gender equality and women's empowerment were the pillars in which it was identified the project has impact in. The impacts on these pillars were indicated in the PD&MR and the monitoring of all these activities is included in the Annual Monitoring Report of the Miro Company.

AENOR assessed the sustainable contributions to the national agenda through the review of the project design document but mainly through the review of evidence provided and interviewing to the local stakeholders.
Finally, regarding the project description, AENOR confirms that is accurate, complete, and provides an understanding of the nature of the project and confirms that the project has been implemented as described in the project description document.

3.2 Participation under Other GHG Programs

The project has not been registered under any other GHG program. Therefore, this section is not applicable.

3.3 Safeguards

No Net Harm

Miro Forestry uses an environmental management system based on the internationally recognised 'Plan, Do, Check, Act' mechanism. A list of impacts and mitigation measures for them was identified during the development stages, including preparation, construction, and operation. Impacts, project activity, receptors, impact magnitude and mitigation measures proposed were defined for the impacts identified in the three stages of the project.

3.3.1

It was identified that the project activity might affect the surrounding environment or might generate incidents or accidents to the workers. In that sense, section 2.1 of the Joint PD&MR indicates the socio-economic and environmental measures to mitigate the impacts of the project.

Hence, the audit team deems the potential environmental and socio-economic impacts of the project implementation were identified by the PP and reasonable measures have been taken to mitigate such impacts.

Local Stakeholder Consultation

The consultation process took place during September 2020. The preparation of the process began with the construction of the map of actors with influence on the carbon project and the identification of easily accessible communication mechanisms for each type of actor through which the meetings were called. the convening of the actors to the meetings was initiated through formal letters to the presidents of the traditional councils and municipal and environmental authorities.

3.3.2

Six meetings with government entities were carried out through personal meetings (The representative of Sekyere Afram Plains, representatives of Asante Akyem North District Assembly, representative of Kwamang Traditional Council, Representative of Sekyere Central District Assembly, Representative Environmental Protection Agency, The representative of Sekyere Kumawu).

In addition, six meetings were held in the communities: Droponso, Serebroso, Nhyiaeso, Ankamadua, Jadeako and Bunuso. Topics treated during the meetings were: Environment and Climate Change, Water - Water Cycle, Water Use, Soil - Importance, Soil Cycle, Conservation - Ecosystems and Conservation and Carbon Credits. During the meetings the participants had the space to ask questions concerning the topics addressed. Comments raised during community meetings were addressed during the meetings, collected and documented.

The details of the local stakeholder consultation process carried during September 2020 were indicated in section 2.2 of the PD&MR report. Community meetings, and multi-stakeholder meetings were held for consulting purposes. The project document shows a summary of the collected comments during the consultation process.

Evidence by means of invitation letters, attendance lists, minutes of the meetings and a photo gallery were provided by the project proponent. Besides, the stakeholder engagement plan of the Miro Company was provided to the audit team (see appendix 1 of this report).

During the interviews with the key community members and stakeholders the audit team checked that Miro has effectively developed said forms of engagement and consultation. During the interview process the respondents showed that they were aware of the project design and implementation, the costs, risks, and potential benefits that might derive from the project, and the process of VCS certification to get the carbon credits. Therefore, the audit team deems that community members and the stakeholders involved in the project were consulted and their opinion or considerations regarding the project or the project activities were taken into consideration by the PP for the project design and implementation.

In addition, all workers stated they were informed of the relevant laws and regulations and were trained or informed about health and safety measures for the work to perform. Participants in the training sessions held by the PP expressed being satisfied with the training sessions, the topics treated, and the methodology to carry them out.

AENOR deems the information and details of the community members involved in the process as stated in said the project document and supporting documentation is credible, reliable and represents what has been done regarding the consultation to the community members interacting with the project.

Hence, AENOR deems the project communicated information about the project design and implementation as well as the risks, costs and benefits, the relevant laws and regulations and the process of VCS Program validation and verification as required by the VCS standard.

Environmental Impact

Under the statutory requirements of the Environmental Assessment Regulations 1999 of Ghana (LI 1652), category of undertakings (Regulation 3) an EIA is required. Thus, Miro Company contracted to an independent consulting firm an Environmental Impact Assessment. The consultants evaluated all potential impacts on the environment in the following stages to determine the significance of each impact:

3.3.3 Description of the nature of the impact

- Description of the magnitude of the impact
- Duration of impact
- Potential consequences
- Likelihood of occurrence/probability
- Severity/degree of significance

The Final Environmental Impact Statement for Proposed Reforestation of 5,000 hectares of Degraded Forest Lands in Boumfoum Forest Reserve, Near Agogo, Ashanti was provided as evidence by the PP and reviewed by the audit team. The following were the main outcomes from the developed study:

- The project presents an opportunity for much-needed interventions to be made in the restoration of the reserve.
- These accruable benefits would reach stool landowners, the local community, the district assembly and forest agencies.

- The proposed development poses some environmental risks which require mitigations to minimise the effect on the environment and stakeholders.
- The impact of the development on farming in the reserve poses some serious challenges
- Although proposed as a longer-term, value-added element of the project, Miro Forestry is currently collaborating with the necessary stakeholders to gain land for the proposed establishment of a timber treatment plant.
- The use of fast-growing Teak and Eucalyptus plantation species accelerates the regeneration process of the reserve. Nonetheless, care should be exercised to ensure that a harmonious landscape is achieved from a combination of the proposed species and the reintroduction of indigenous species as part of the plans to restore the reserve.
- Collaboration with institutional and local stakeholders is critical to the successful execution of the project
- Since the Eucalyptus species are mainly hybrid varieties, Miro Forestry should provide regular growth and general performance data to the Forestry Commission
- Soil improvement measures such as the application of fertilisers should be undertaken in a carefully controlled manner, ensuring that the excessive application of fertilisers is avoided at all costs
- Miro Forestry should ensure that soil erosion is kept at a minimum by adopting the prescribed mitigations and adopting preventive measures to limit the effects of run-off from slopes during the rainy seasons.
- The reserve is traversed by many seasonal streams that are likely to flood low lying valley areas in the reserve during the rainy seasons.
- Road construction and maintenance activities can lead to increased surface run-off from slopes, leading to soil erosion.
- There are occasional sightings of some fauna operating in and around Miro Forestry's allocated compartments near riparian strips and water bodies.
- Miro Forestry should develop agroforestry schemes such as controlled intercropping within its allocated areas.
- Miro Forestry should consider adopting out-grower schemes whereby farmers are supported with all necessary technical and financial inputs for the planting of trees under the company's supervision.
- The management of fire is an essential part of protecting the reserve.
- Periodic and annual stakeholder meetings and consultations should be undertaken with all local and institutional stakeholders to share best practices and communicate project progress, successes, and challenges.

During the remote interviews with the Miro local staff, it was demonstrated the rapid environmental assessment that the company undertakes on each allocated leased area prior the development of the project activity

In conclusion, the audit team deems the project does not generate negative impacts on the environment. As previously mentioned, the activities to be carried out do not generate anticipated damages to the

community or to biodiversity. On the contrary, they generate various benefits for people and the environment through the plantations.

Public Comments

This project was open for public comment from 03/03/2021 to 02/04/2021. No comments were received.

AFOLU-Specific Safeguards

3.3.4 Stakeholder identification

The project's stakeholder strategy is to develop fruitful working relationships with its key stakeholders; thereby leveraging their support to enable the company to achieve its planting, commercial, environmental, and social objectives.

3.3.5

3.3.5.1 For identifying stakeholders Miro used mapping tools such as the influence/dependence matrix and influence/support mapping.

The audit team considers the process of stakeholder identification was carried out as per VCS requirements and represents in a reliable way the real situation and the stakeholder context in the project area.

A stakeholder mapping was developed to identify the relevant stakeholders and their influence in the project's activities.

Processes to ensure ongoing communication

The stakeholder engagement is managed daily by the Community Relations Manager, reviewed, and supervised by the Business Operation Manager. Progress and setbacks are reported to management at weekly management meetings. A summary of stakeholder engagement and any changes to the plan are reported at the quarterly Environmental, Social and Governance (ESG) Committee meeting. This information was crosschecked with the Miro Ghana Social Manager from the local team during the remote interviews.

3.3.5.2

In addition, during the remote interviews with the community members (workers) and the local social team, it was demonstrated to the audit team that the company has a grievance mechanism in place, which provides employees and stakeholders with a mechanism to express any grievance that might arise due to the project activity. Besides, t

Hence, in the opinion of the AENOR team there is a process to ensure ongoing communication with the key stakeholders and the community members involved in the project.

he Company established notice boards in the surrounding communities, attached to these are a suggestion box that is checked monthly. The Community Liaison Officer is responsible for hosting workshops on the grievance mechanism. A notice is published in all communities stating how to contact the Company and how the grievance will be dealt with.

Risks to local stakeholder

Details of the stakeholders' risks assessment and mitigation measures identified were provided in section 2.5 of the Joint PD&MR document, in which community members and other stakeholders' concerns collected during the consultation and the mitigation measures proposed by Miro were indicated.

In 2016 Miro designed and rolled out a Land Development Policy and Implementation Framework. Miro's Land Policy Principles state:

3.3.5.3

i. "Miro respects all national and local laws and regulations. Long-term tenure and rights to the land and forest resources are clearly defined, documented and legally established under national legislation.

ii. Miro recognises and respects the rights of all land users and respects the cultural heritage of the communities where the Company operates. The Company's goal is to have a positive impact on the livelihoods of the people surrounding and affected by its operations. Miro works closely to consult with stakeholders to ensure the protection of their land rights, cultural heritage sites and values.

iii. Miro aims to conserve biological diversity and its associated values including water resources, soils, ecosystems and landscapes.

iv. Miro is firmly committed to sustainable forest management practices, including those prescribed by the Principles and Criteria of the Forest Stewardship Council (FSC) and the International Finance Corporation (IFC) Performance Standards."

In order to enforce this, the company rolled out several procedures and steps to mitigate land development associated risk; this is known as the 'MFC Land Development – Policy, Implementation Framework and Guidelines for Conducting Environmental and Social Risk Assessments [1]

An extract of this Guideline indicates the exposure risk identified by Miro, on the following situational changes:

the exposure to risk will be affected by one of the following situational changes:

- Change of access to nearby/free/convenient farming land
- Change of access to grazing land or water
- Change of access to land being used for residence and farming

This has the potential to expose these groups to:

- Compromised food security or to lifestyle (nomadic – Fulani)
- Compromised income generation options and capacity
- Compromised ability to care for a family/gendered roles

[1] Supporting documents/1.2 PO Information/ MFC Land Development – Identifying People at Risk Ghana 2020.03.12

- Compromised climate resilience (particularly during extreme weather events)

The project gathers information to identify people at risk, through a questionnaire and closed question formats, leading to ha high level assessment according to the defined criteria. After that, there is a second stage with a detailed assessment through open questions to build an integral vision of the life of the individual to allow for a tailored approach to address vulnerability.

The following are the main concerns of the community members representatives assessed during the consultation: Loss of farming land leading to increased food insecurity, land for village expansion, reduced access to forest reserve for traditional rights, personnel health & safety risks, basic social services, and employment opportunities. While other stakeholder's concerns assessed were land disputes and incorrect forest reserve demarcation, relocation of compartments by FC, company perception and company future, lack of donations, Presence of Fulani.

By means of documents reviewed and the interviews performed, AENOR considers that the summary of the comments received during the consultation process included in the project document is complete. The main conclusions of the meetings and opinions collected from meetings are included in the project description and monitoring report document.

Hence, in the opinion of the AENOR team the local stakeholder consultation process was suitability performed and the PP's response to the inputs was appropriate. The audit team deems that the PP communicated the information about the project design and implementation, risks, costs and benefits, relevant laws and regulations and the process of VCS Program validation and verification in accordance with the requirements established by the VCS Standard.

After the review of the supporting documentation, the interview with the local project staff and direct beneficiaries of the project, the audit team deems the project has been designed appropriately and is implementing plans and processes to ensure the project will not create any negative impacts on local stakeholders, or in case those impacts appear there were mitigation measures designed for such impacts.

3.4 Application of Methodology

Title and Reference

The project used the CDM methodology "Large-scale Consolidated Methodology: AR - ACM0003 A/R Afforestation and reforestation of land except wetlands (Version 02.0)".

In addition, the following Tools were applied by the project:

• Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (Version 01).

3.4.1

• Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities (Version 04.2).

• Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities (Version 01.1.0).

• VCS AFOLU Non-Permanence Risk Tool (Version 4).

Applicability

The Joint PD&MR states all evidence used to demonstrate each condition of the applicable methodology. In opinion of AENOR, the evidence and explanations confirm the fulfilment of the project with the methodology.

The assessment was carried out for each applicability criterion and included, among others, the review of evidence and sources provided in the project document and the compliance check of the local project setting with the applicability conditions as per AR - ACM0003 requirements:

3.4.2

Applicability conditions	Justification
a) The land subject to the project activity does not fall in wetland category.	A GIS analysis was performed to assure the project is not being developed in wetlands. the model for mapping tropical wetlands was used to determine the eligible area of the project. (Research provided*: Gumbricht et al. (2017) An expert system model for mapping tropical wetlands and peatlands reveals South America as the largest contributor. Global Change Biology*) A dataset of wetland classes, according to the Centre for International Forestry Research (CIFOR), was compared to the planted area. As a result, it was found that part of the currently planted area falls into a category of Wetland. Thus, the zone was removed from the eligible area and not considered for the GHG calculations. Evidence as the TROP-SUBTROP_Wetlands_2016 _CIFOR was provided. This was confirmed by the audit team during the remote process and with other supported documents, including the descriptions in the project document.

b) Solid disturbance attributable to the project activity does not cover more than 10% of area in each of the following types of land, when these lands are included within the project boundary (i) Land containing organic soils (ii) Land which, in the baseline is subjected to land use and management practices and received in appendices 1 and 2 of the methodology	(i) The soils of the project area were analyzed comparing to a scientific publication (Asiamah, et al., 2007) in which the project area soils are described as predominantly sandy loam over sandy clay loam and among the soil series in the project area no organic soils are present. (ii) The baseline before the project start date was grasslands without any inputs. Condition confirmed during the remote process and with other supported documents, including the descriptions in the project document.

Regarding the rest of the tools or methodologies used, their applicability was demonstrated in the project document and summarized in the following table:

Tool	Applicability Condition	Compliance
Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities	Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced; This tool is not applicable to small - scale afforestation and reforestation project activities; The A/R CDM project activity is implemented on degraded lands, which are expected to remain degraded or to continue to degrade in the absence of the project, hence the land cannot be expected to revert to a non-degraded state without human intervention; The land subject to the project activity does not fall in wetland category;	a) The project has realized an assessment of the applicable laws, regulations and conditions and it was demonstrated that the project does not lead to violation of any applicable law even if the law is not enforced. b) The approach to justify the determination of the most plausible baseline scenario was done complete following all steps in the methodology. The audit team found consistency between the determination of a baseline scenario and the determination of additionality of the project activity since same methodology was used to determine both.
Estimation of carbon stocks and change in	This tool has no internal applicability conditions	N/A

carbon stocks of trees and shrubs in A/R CDM project activities (Version 04.2).		
Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities (Version 01.1.0).	(a) The areas of land to which this tool is applied: (i) Do not fall into wetland category (ii) Do not contain organic soils as defined in "Annex A: glossary" of the IPCC GPG LULUCF 2003 (iii) Are not subject to any of the land management practices and application of inputs as listed in the Tables 1 and 2 (b) The A/R CDM project activity meets the following conditions: (i) Litter remains on site and is not removed in the A/R CDM project activity (ii) Soil disturbance attributable to the A/R CDM project activity, if any, is: • In accordance with appropriate soil conservation practices, e.g.: follows the land contours • Limited to soil disturbance for site preparation before planting and such disturbance is not repeated in less than twenty years	(a) See previous table (b) (i) and (ii) The local staff participating in sylviculture practices demonstrated that litter remains on site and it is not removed. And the soil disturbance is limited to site preparation before planting and such disturbance is not repeated in less than twenty years.

AENOR, based on records provided including spreadsheets calculations of the emissions reductions, has verified that applicability conditions of the different tools are complied. In conclusion, the project activity complies with the applicability conditions of the methodology, and any tools or modules selected by the PP.

Project Boundary

The Miro Ghana Commercial Plantation project area is located in Ghana's Ashanti region, in the Asante Akim North, Sekyere East and Sekyere West districts. It is composed of 763 compartments with a total area of 5,768 ha; these have been planted with different species of trees between 2016 and 2019. The Boumfum Forest Reserve, near Agogo, in which the majority project is being proposed, is a 26,000 hectares reserve that has been logged over several times and suffered from wildfires. The reserve is seriously degraded and requires effective management and technical interventions to restore it.

3.4.3

Regarding the Carbon Stock Changes and considering the applicable methodology, the chosen carbon pools and GHG accounted are the following:

Carbon pools		Selected	Justification/Explanation
Baseline and Project scenario	Above-ground biomass: Tree or non-tree (Only CO2 considered)	Yes	This is the major carbon pool subjected to project activity.
	Below-ground biomass: Tree or non-tree (Only CO2 considered)	Yes	Optional. Carbon stock in this pool is expected to increase due to the implementation of the project activity.
	Dead wood and Litter (Only CO2 considered)	No	Conservatively excluded. The baseline cover is mostly comprised by grasslands. Therefore, the presence of deadwood and litter is deemed to be zero.
	Soil organic carbon (Only CO2 considered)	No	This is estimated as an annual increase over 20 years according to the applicable tool, and therefore, is only included in the project and not the baseline.
Project	Above-ground biomass: Tree or non-tree (Only CO2 considered)	Yes	Major carbon pool of the project.
	Below-ground biomass: Tree or non-tree (Only CO2 considered)	Yes	Biomass included in the roots of the vegetation cover are significant in the project activity
	Dead wood and Litter (Only CO2 considered)	Yes	Biomass generated by limbs and pruning are left in the plantations soil. Thus, there is an accumulation of carbon due to project activities.
	Soil organic carbon (SOC) (Only CO2 considered)	Yes	It is expected that there will be a significant increase in this carbon pool due to the project activity.

According to the VCS requirements, sources of emissions that are expected to increase in the project scenario compared to the baseline case must be included if the exclusion would lead to a significant overestimation of the total net anthropogenic GHG emission reductions generated during the fixed baseline period. Furthermore, that sources considered insignificant according to the latest VCS Methodology Requirements can always be neglected. In this regard, the following GHG sources may be deemed insignificant and need not to be accounted for in the case of ARR projects, in accordance with Section 3.3.6 of the VCS Methodology Requirements:

- N2O emissions from project activities that apply nitrogen containing soil amendments and N2O emissions caused by microbial decomposition of plant materials that fixes nitrogen.
- GHG emissions from the removal or burning of herbaceous vegetation and collection of non-renewable wood sources for fencing of the project area.
- Fossil fuel combustion from transport and machinery use in project activities.

Considering the justifications, assumptions and supporting information provided and the design of the project, AENOR deems that project boundary is correctly defined and in compliance with the applicable methodology and VCS requirements.

Baseline Scenario

The Miro Ghana Commercial Plantation project performed a Land Cover Classification from a Landsat 8 multispectral satellite image from December 26, 2014. A radiometric and atmospheric correction was performed to improve the image for land cover classification. For land cover classification, the methodology used was based on supervised remote sensing techniques to generate land covers such as forest land, cropland, grassland, settlements, wetlands, and other lands. The results showed that 8% from the initial project area were cover by forest lands. Evidence of this analysis were provided by the project developer to the audit team (LandCover_2014_AR_MIRO_Ghana).

3.4.4

In addition, as part of the pre-feasibility process for the Miro Ghana Commercial Plantation project, an Afforestation and Reforestation (A/R) eligibility analysis was performed for the project region. It was considered the year of establishment of the plantation and the ten years prior to such plantation. Locations where there was no forest were considered eligible area, and the forest area remainder was defined as ineligible area. The definition of forest used was the official national definition of forest of Ghana.

A complete report by South Pole was provided, in which it is explained the methodology employed to carry out the A/R eligibility analysis, using Landsat 7 and 8 medium-resolution multispectral imagery to obtain the forest and non-forest cover through supervised classification. The results of the analysis were described in the Joint PD&MR document, and the eligible project area over the Landsat image used to classify the land cover was illustrated in Section 3.4 of the project document. The audit team deems the analysis and data used ensure the proper identification of the vegetal cover of the land at the initial date of the project.

The outcome of these analysis was that the baseline scenario before the project activities start was open grassland areas. The audit team deems this statement is reliable and represents appropriately the situation before the project was implemented.

The audit team found assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable. Documentary evidence used in determining the baseline scenario is relevant, and correctly quoted and interpreted in the project description. Relevant national regulations and circumstances have been considered and are listed in the project description. The procedures for identifying the baseline scenario have been correctly followed according to the steps in the combined tool and the identified scenario reasonably represents what would have occurred in the absence of the project.

Hence, AENOR considers that the identified baseline scenario is correctly justified

Additionality

A complete analysis of the additionality was described in the section 3.5 of the Joint PD&MR document. A combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities was used. Consequently, a four-step approach was followed to demonstrate additionality: 1.

3.4.5

Identification of alternative land-use scenarios to the proposed VCS AFOLU project activity; 2. Investment analysis (not applicated); 3. Barrier analysis; 4. Common practice analysis.

In the first step continuation of pre-project land use, coca crops, Project activity without being registered under VCS were analysed. After analysing the consistency of the alternative scenarios, just the continuation of pre-project land use and A/R activities without being registered in VCS were identified as the alternative scenarios. Resulting that the most plausible scenarios which would occur in the absence of the project is continuation of pre-project land use activity (subsistence agriculture) since it is the most plausible economic activities people are used to develop in the project area.

The investment analysis was not done, instead the barrier analysis was carried out.

The principal barriers analysed were economic, financial, variations in the quantities of wood produced, variations indirect production costs and discount rate, climatic conditions, and land tenure. The alternative land use scenarios and the barriers they face were also assessed. According to the analysis, the potential baseline scenarios are reduced to those that do not face barriers: continuation of pre-project land use.

As the fourth step a common practice analysis was carried out and it was concluded that the commercial plantations projects are not considered as a common practice within the country.

The audit team considers the steps used to demonstrate additionality followed correctly and precisely the methodological tool

Hence, after the assessment of the explanations and justifications in the Joint PD&MR document and the review of the submitted evidence, also detailed in the project document, AENOR deems credible and reliable the supported documents provided. The information described in the project document is consistent with them. Thus, it can conclude that there are several characteristics that make each activity different from activities developed in the surrounding area. Thus, the project activity is not the baseline scenario, it is not the common practice and hence, it is additional. The incomes from VCUs will help to overcome the faced barriers by the project and will alleviate the expected long period for revenues.

Quantification of GHG Emission Reductions and Removals

The methodology “AR-ACM0003 A/R Large scale Consolidated Methodology: Afforestation and reforestation of lands except for wetlands (Version 2.0)” was used.

The validation team performed an intensive quantification review of all input data, parameters, formulas, calculations, conversions, statistics and resulting uncertainties and output data to ensure consistency with the VCS documentation, methodology modules, and the Joint PD&MR.

3.1.3

Furthermore, the validation team reproduced calculations for selected samples to ensure accuracy of the results. Conversion factors, formulas, and calculations were provided by the PP in spreadsheet format to ensure all formulas were accessible for review. The validation team recalculated subsets of the analysis to confirm correctness. Where applicable, references for analysis methods or default values were checked against relevant scientific literature for best practice.

The net anthropogenic GHG removals by sinks shall be calculated as follows:

$$\Delta C_{AR-CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t$$

Where:

$\Delta C_{AR-CDM,t}$ = Net anthropogenic GHG removals by sinks, in year *t*; tCO_{2-e}

$\Delta C_{ACTUAL,t}$ = Actual net GHG removals by sinks, in year *t*; tCO_{2-e}

$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks, in year *t*; tCO_{2-e}

LK_t = GHG emissions due to leakage, in year *t*; tCO_{2-e}

Baseline net GHG removals by sinks

Procedures to be used for calculation of *ex ante* baseline net GHG removals by sinks are detailed in the AR-ACM0003 methodology (Version 02.0) under the section 5.4 "Baseline net GHG removals by sinks". According to the methodology baseline net GHG removals by sinks are calculated with the following equation:

$$\Delta C_{BSL,t} = \Delta C_{TREE\_BSL,t} + \Delta C_{SHRUB\_BSL,t} + \Delta C_{DW\_BSL,t} + \Delta C_{LI\_BSL,t}$$

Where:

$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks in year *t*; t CO_2-e

$\Delta C_{TREE\_BSL,t}$ = Change in carbon stock in baseline tree biomass within the project boundary in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{SHRUB\_BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{DW\_BSL,t}$ = Change in carbon stock in baseline dead wood biomass within the project boundary, in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e

$\Delta C_{LI\_BSL,t}$ = Change in carbon stock in baseline litter biomass within the project boundary, in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e

Following with section 5 of the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" The Carbon stock in trees, shrubs, dead wood and litter were set to zero. Since in the districts where the project area is located, the most common vegetation type are grasslands, a result of agriculture and fire. Due to the dynamic of the agricultural practice in the area, the fallow periods are short, which is insufficient for forest regeneration or the establishment of the local flora. These facts lead to a non-significant carbon stock in the baseline scenario and thus, these pools are set to zero. AENOR deems that this assumption is correct and in accordance with the methodology, tools, and the VCS requirements.

Project net GHG removals by sinks

Procedure to be used for calculation of *ex-ante* actual net GHG removals by sinks are detailed in the AR-ACM0003 methodology (Version 02.0) under the section 5.5 "Actual net GHG removals by sinks". The net estimate of carbon removals was made for the entire plantation eligible area for the 30 years of the crediting period.

$$\Delta CACTUALt = \Delta Cp,t - GHGE,t$$

Where;

$\Delta \boldsymbol{CACTUALt}$	Net current GHG removal by reservoirs in year *t*; tCO_2e.
$\Delta \boldsymbol{Cp}, \boldsymbol{t}$	Change in the carbon stock of the selected reservoirs in the project, in year *t*; tCO_2e
$\boldsymbol{GHGE}, \boldsymbol{t}$	Increase in non-CO_2e GHG emissions within the limit of the project area because of the implementation of the project activities, in year *t,* according to the procedure presented in the tool.

Stratification Area:

In Accordance with the "AR-ACM0003 A/R Large-scale Consolidated Methodology: Afforestation and reforestation of lands except wetlands Version 02.0": If biomass distribution over the project area is not homogeneous, stratification should be carried out to improve the precision of biomass estimation. Different stratifications may be appropriate for the baseline and project scenarios to achieve optimal precision of estimation of net GHG removals by sinks.

Regarding this project, the actual net GHG removals by sinks for the stratification of ex-ante estimations are based on the project planting schedule plan. In the case of project area stratification is included in the year of establishment of the project area per tree species, see table below. Additionally, there were included the future areas to be established and indicated in section 4.2 of the Joint PD&MR document. The PP based the stratification on the year of plantation and the tree species, summarized in the following table:

Species	Year	Eligibility	Area (ha)	Strata
Acacia mangium	2016	Eligible	183,6	1.1
Eucalyptus pellita	2016	Eligible	611,2	1.2
Tectona grandis	2016	Eligible	227,1	1.3
Corymbia citriodora	2016	Eligible	130,2	1.4
Acacia mangium	2017	Eligible	129,4	2.1
Eucalyptus pellita	2017	Eligible	386,1	2.2
Gmelina arborea	2017	Eligible	6,8	2.3
Tectona grandis	2017	Eligible	48,4	2.4
Corymbia	2017	Eligible	49,7	2.5
Acacia mangium	2018	Eligible	188,0	3.1
Eucalyptus pellita	2018	Eligible	717,3	3.2
Tectona grandis	2018	Eligible	56,4	3.3
Gmelina arborea	2018	Eligible	77,2	3.4
Corymbia citriodora	2018	Eligible	131,1	3.5
Other species	2018	Eligible	6,4	3.6
Acacia mangium	2019	Eligible	33,3	4.1
Eucalyptus pellita	2019	Eligible	343,8	4.2
Tectona grandis	2019	Eligible	17,4	4.3
Gmelina arborea	2019	Eligible	511,0	4.4
Corymbia citriodora	2019	Eligible	13,6	4.5

Other species	2019	Eligible	2,9	4.6
TOTAL			3,871,0	

The actual net GHG removals by sinks were calculated as follows:

$$\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t}$$

Where:

$\Delta C_{ACTUAL,t}$ = Actual net GHG removals by sinks, in year t; t CO_2-e

$\Delta C_{P,t}$ = Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; t CO_2-e

$GHG_{E,t}$ = Increase in non-CO_2 GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t, as estimated in the tool "Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity"; t CO2-e

Change in the carbon stocks in project, occurring in the selected carbon pools in year t was calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE\_PROJ,t} + \Delta C_{SHRUB\_PROJ,t} + \Delta C_{DW\_PROJ,t} + \Delta C_{LI\_PROJ,t} + \Delta SOC_{AL,t}$$

Where:

$\Delta C_{P,t}$ = Change in the carbon stocks in project, occurring in the selected carbon pools, in year *t*; t CO_2-e

$\Delta C_{TREE\_PROJ,t}$ = Change in carbon stock in tree biomass in project in year *t*, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO_2-e

$\Delta C_{SHRUB\_PROJ,t}$	=	Change in carbon stock in shrub biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities; t CO_2-e
$\Delta C_{DW\_PROJ,t}$	=	Change in carbon stock in dead wood in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e
$\Delta C_{LI\_PROJ,t}$	=	Change in carbon stock in litter in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO_2-e
$\Delta SOC_{AL,t}$	=	Change in carbon stock in SOC in project, in year t, in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; t CO_2-e

Estimating carbon stock in threes at given point in time

To estimate the carbon stock in tree biomass at a given point in time, the Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities AR-TOOL14 (Version 4.1)" was used.

Volume estimation

Yield values from the project data of the expected net increment in volume (MAI) for industrial processing were considered more suitable for the project species. There is not much public written literature of growing plantation in Ghana, thus, the growth rate employed was selected for other countries, considering similarities in the climatic conditions.

The Audit team reviewed the literature in which the ex-ante or projected estimations were made based on and deems the scientific studies used to be real, from reliable sources, apply to the project site and are specific to each tree species of the project.

Ex-ante or projected estimations were made based on the MAI of each species planted in the project area, which is the average growth per species extracted from the database of the Microforest software. The udit team deems this assumption is in accordance with the methodology requirements.

Biomass estimation

The estimation of standing tree biomass for each stratum was calculated according to Equation 13 of the AR-TOOL14 and Equation 5 of the Appendix 1 from the AR-TOOL14:

$$B_{tree} = A \times b_{tree}$$

B_{TREE} = Tree biomass in the tree biomass estimation strata; t d.m.

A = Sum of areas of the tree biomass estimation strata; ha

b_{TREE} = Mean tree biomass per hectare in the tree biomass estimation strata; t d.m. ha-1

And,

$$b_{TREE} = [V_{TREE} \times D \; x \; BEF_2] \times (1 + R)$$

b_{TREE} = Mean tree biomass per hectare in the tree biomass estimation strata; t d.m. ha-1

V_{tree} = Mean tree volume per hectare in the tree biomass estimation strata; m^3 ha-1. For this case, it will be the MAI value of each species multiplied by the respective year of plantation establishment.

D = Basic wood density; t m-3

BEF_2 = Biomass Expansion Factor; dimensionless

R = Root-to-shoot ratio; dimensionless

Mean carbon stock in terms of CO_2e

The conversion of the standing tree biomass for each stratum in term of carbon units was calculated according to Equation 12 of the AR-TOOL14:

$$C_{TREE} = \frac{44}{12} \times CF_{tree} \times B_{tree}$$

C_{TREE} = Carbon stock in trees in the tree biomass estimation strata; tCO_2e

CF_{TREE} = Carbon fraction of tree biomass; t C (t d.m.)-1

B_{TREE} = Tree biomass in the tree biomass estimation strata; t d.m.

Carbon in deadwood and litter was calculated using Equations 9 and 15 of the Tool "A/R Tool 12: Estimation of carbon stocks and change in carbon stocks in dead Wood and litter in A/R CDM projects activities" of the AR-ACM0003 Methodology. This accepts the use of a conservative default value, which relates to the carbon content (in deadwood and litter) as a percentage of the total carbon in the tree's biomass.

$CDW,i,t = CTREE,i,t \; x \; DFDW$

Where:

$\boldsymbol{CTREE, i, t}$ Carbon stock in the biomass of trees in stratum *i* at a time point in year *t* (tCO_2e).

Conservative default value expressing carbon stock in deadwood as a percentage of carbon stock in tree biomass (tCO_2e).

$$CLI,i,t = C_{TREE,i,t}\ x\ DF_{LI}$$

Where:

$\boldsymbol{CLI, i, t}$ Leaf litter carbon stock in stratum *i* at a time point in year *t* (tCO_2e).

$\boldsymbol{CTREE, i, t}$ Carbon stock in the biomass of trees in stratum *i* at a time point in year *t* (tCO_2e).

The conservative default value that expresses the carbon stock in the litter as a percentage of the carbon stock in the tree biomass (tCO_2e).

Soil organic carbon (SOC) was calculated using Equations 1, 2, 6, and 8 of the "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities" of the AR-ACM0003 Methodology.

$$SOCInitial,i = SOCRef,i\ x\ fLU,i\ x\ fMG,i\ x\ fIN,i$$

Where:

$\boldsymbol{SOCInitial}$, Soil organic carbon stock at the start of the project activity in stratum *i* of the soil areas (tC/ha).

$\boldsymbol{fLU, i}$ Relative factor of change of stock for land use at baseline in stratum *i* of soil areas (dimensionless).

$\boldsymbol{fMG, i}$ Relative factor of change of the stock for the management regime in the baseline in the stratum *i* of the soil areas (dimensionless).

$\boldsymbol{fIN, i}$ Relative factor of change of the stock for the regime of reference inputs in stratum *i* of the soil areas (dimensionless).

$\boldsymbol{SOCRef, i}$ Reference to the soil organic carbon stock (SOC) corresponding to the reference of native soil condition by climatic region and soil type applicable to stratum *i* of the soil areas (tC/ha).

$SOC_{LOSS},i = SOC_{INITIAL}$, i*0.1

Where:

SOCLOSS, *i* - is caused by disturbances attributable to the AR project activity, in stratum *i* of the soil area; tC/ha.

0.1 - Approximate proportion of SOC loss within the first five years from the year of preparation.

The values of $SOC_{Ref,i}, f_{LU,i}, f_{MG,i}, f_{IN,i}$, are taken from Tables 3 and 6 of the Tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities". The values taken are consistent with the type of soil and the management in the baseline of the project.

The project did not use machinery for silvicultural activities, therefore, there was no disturbance in the soil. Thus, carbon loss is accounted for as follows:

$$SOC_{LOSS,i} = 0$$

$$dSOC_{t,i} = \frac{SOC_{Ref,i} - (SOC_{INITIAL,i} - SOC_{LOSS,i})}{20\ years}$$

Where:

dSOCt, Rate of change in the SOC stock in stratum *i* of the soil areas, in year *t*; tC/ha * year.

$$\Delta SOC_{AL,t} = \frac{44}{12} \sum_i A_i\ dSOC_{t,i}\ x\ 1\ year$$

Where:

ΔSOCAL, *t* Change in the SOC stock in the soil areas that meet the applicability conditions of this tool, in the year; tCO_2e.

Ai Area of stratum *i* of soil areas; ha.

Soil disturbance attributable to project activity was accounted to be greater than 10% of the area of the stratum:

$$SOC_{LOSS,i} = SOC_{initial,i} \times 0.1$$

The rate of change in SOC stock in a project scenario until the steady state is reached is estimated as follows:

$$dSOC_{t,i} = \frac{SOC_{REF,i} - (SOC_{INITIAL,i} - SOC_{LOSS,i})}{20\ years} \quad for\ t_{PREP,i} < t < t_{PREP,i} + 20$$

$dSOC_{t,i}$ The rate of change in SOC stock in stratum *i* of the areas of land. in year *t*; t C ha-1 yr-1

$SOC_{REF,i}$ Reference to SOC stock that corresponds to the reference condition in native lands (i.e. non-degraded, unimproved lands under native vegetation normally forest) by climate region and soil type applicable to stratum *i* of the land area; t C ha-1

$SOC_{INITIAL,i}$ SOC stock at the beginning of the A/R CDM project activity in stratum *i* of the land area; t C ha-1

$t_{PREP,i}$ The year in which first soil disturbance takes place in stratum *i* of the land area

i 1. 2. 3. … strata of areas of land; dimensionless

t 1. 2. 3. … years elapsed since the start of the A/R CDM project activity

The application of these equations results in an estimated rate of 0.3 tC ha yr-1 in soil organic carbon (SOC).

The change in SOC stock for all the strata of the land area, in year *t* is calculated as indicated in Equation 8 of the Tool.

$$\Delta SOC_{AL,t} = \frac{44}{12}\ x \sum_i A_i\ x\ dSOC_{t,i}\ x\ 1year$$

$\Delta SOC_{AL,t}$ = Change in SOC stock in areas of land meeting the applicability conditions of this tool. in year *t*; tCO_2e

A_i = The area of stratum *i* of the areas of land; ha

$dSOC_{t,i}$ = The rate of change in SOC stocks in stratum *i* of the areas of land; t C ha-1 yr-1

i = 1. 2. 3. … strata of areas of land; dimensionless

Calculation of emissions removals

According to the standard requirements, for those projects where harvesting practices is contemplated on project activities, the loss of carbon due to harvesting shall be include in the quantification of the project emissions. Due to the project activities contemplate an increment on project area with different rotation periods per specie, the long-term average (LTA) GHG benefit was calculated as follows:

$$LA = \frac{\sum_{t=0}^{n} PE_t - BE_t}{n}$$

Where:

LA The long-term average GHG benefit

PEt The total to-date GHG emission reductions and removals generated in the project scenario (tCO_2e). Project scenario emission reductions and removals shall also consider project emissions of CO_2, N_2O, CH_4 and leakage.

BEt The total to-date GHG emission reductions and removals projected for the baseline scenario (tCO_2e). Accounted

t Year.

n Total number of years in the established time-period

Leakage

According to the applied methodology the only leakage emissions that can occur are the GHG emissions due to displacement of pre-project agricultural activities. As described in the project document section 1.17, no agricultural activities are expected to be displaced due to the project actives since social mitigation measures are in place (alternative livelihood solutions-employment). Therefore, leakage is not expected to occur and was considered 0. Thus, it is not included in the calculations.

Based on the remote interviews with the community members representatives and other stakeholders and the evidence provided, AENOR deems this consideration as credible.

Estimated Net GHG Emission Reductions and Removals

The anthropogenic net removal of GHG by the reservoirs was estimated according to Equation 5 of the AR-ACM0003, as presented below:

$$\Delta C_{AR-CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t$$

Where:

$\Delta_{CAR-CDM,t}$: Net anthropogenic removal of GHG by reservoirs, in year *t*; tCO_2e

$\Delta_{CACTUAL,t}$: Net current GHG removal from reservoirs, in year *t*; tCO_2e

$\Delta_{CBSL,t}$: Net GHG removals by reservoirs at baseline, in year *t*; tCO_2e

L_{Kt}: GHG emissions due to leaks, in year *t*; tCO_2e

Since the baseline removals and emissions due to leaks were considered to be zero, net anthropogenic removals are expressed according to the formula:

$$\Delta C_{AR-CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t}$$

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated GHG emission reductions or removals (tCO_2e)
2016	0	355	0	355
2017	0	43.595	0	43.595
2018	0	61.783	0	61.783
2019	0	102.439	0	102.439
2020	0	124.838	0	124.838
2021	0	176.398	0	176.398
2022	0	223.155	0	223.155
2023	0	271.129	0	271.129
2024	0	318.290	0	318.290

2025	0	366.957	0	366.957
2026	0	251.885	0	251.885
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
2030	0	0	0	0
2031	0	0	0	0
2032	0	0	0	0
2033	0	0	0	0
2034	0	0	0	0
2035	0	0	0	0
2036	0	0	0	0
2037	0	0	0	0
2038	0	0	0	0
2039	0	0	0	0
2040	0	0	0	0
2041	0	0	0	0
2042	0	0	0	0
2043	0	0	0	0
2044	0	0	0	0
2045	0	0	0	0
Total estimated ERs				1,940,824
Total number of crediting years				30
Average annual ERs				**64,694**

The expected total GHG benefit is estimated in 58,224,709 tCO_2e for the 30 years of the crediting period. However, according to the standard requirements the Long-term Average was applied and as a result, the project expects to reduce 1,940,823.6 tCO_2e during the entire crediting period (without considering the risk buffer).

AENOR deems that values are correct and consistent with the sources.

The values and estimates presented in the Joint PD&MR are considered reasonable based on the documentation reviewed, further references and the result of the interviews during the onsite visit.

The Joint PD&MR describes in an appropriate way with evidence and justifications how the project activity fulfils with the applicability conditions of the tool.

Based on the information reviewed, it can also be confirmed that the sources used are correctly quoted and interpreted in the Joint PD&MR and supporting documents. All assumptions and data indicated in the PD and all relevant sources were checked and confirmed.

In essence, the methodology was correctly applied following the requirements. All values in the Joint PD&MR are considered reasonable in the context of the proposed VCS project activity. Data sources are quoted correctly. Hence, the calculation of baseline emissions, project emissions and the estimated net GHG emission reductions are considered correct.

Methodology Deviations

No methodology deviations were applied.

Monitoring Plan

3.4.7 The monitoring plan presented in the PD complies with the requirement of the methodology. The assessment team checked all parameters presented in the monitoring plan against the requirements of the methodology. For the monitoring of carbon stock changes, the requirements and parameter list as per methodology and associated tools were followed.

3.4.8 The list of parameters available at validation and the values used was also checked by AENOR and it is deemed complete and consistent with calculations and assumptions considered. The following table summarizes the data/parameters available at validation:

Data/Parameter available al validation	Value	Assessment procedure and result
Root to shoot ration for mixed tropical broadleaf species (R_{mix})	0.42	Value is consistent with validated source: IPCC "Good Practice Guidance for LULUCF". 2003. Table 3A.18 (*for primary tropical/subtropical moist forest)*
Biomass Expansion factor (BEF)	1.5	Values are consistent with validated sources: IPCC 2003, Good Practice Guidance for Land Use, Land-Use Change, and Forestry. (Tropical, broadleaf, over bark.)

Data/Parameter available al validation	Value	Assessment procedure and result
Carbon fraction	0.47	Values are consistent with validated sources: 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Table 4.3.
$SOC_{REF,i}$	56	CDM_AR_tool_16."Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities". Version 01.1.0. Tropical, moist. Average (HAC and LAR) for the tropical forest as PP project lies on the border of the moist forest zone.

The list of monitored data and parameters is the following

- DBH (Diameter breast height)
- Ht (Height)
- Plot location
- Plot area A_{plot}

Two basic types of plantation inventories are common practice in managing a company's growing stock.

- Management Inventories, with the main purpose of determining current volume and quality of stands, and a secondary aim of using this information for predicting their future growth and yield with growth models. An additional advantage is standing information gathering (weeds, pests, etc.).
- Thinning Control Inventories, which can be used for the same purposes as the management inventories as mentioned above but have the additional advantage of quality control of the marking operation.

The frequency of the enumerations is based on the management objective of the plantation. The field monitoring to estimate the total CO_2e content captured by the plantations, with a sampling error of 10% or less, was carried out by the establishment of circular plots of 500 m² and using stratified sampling. All the measurements to collect form the plots were described in the Joint PD&MR.

The procedures described in section 5 of the Joint PD&MR were reviewed by the AENOR team and cross-checked against the applicable methodology and associated tools. The data collection was explained and reproduced by the workers/monitoring team in a demonstration video elaborated by the project proponent for audit purposes. Additionally, the audit team interviewed the local management and technicians team involved in the project to deeply understand the monitoring of the project. The audit team found the monitoring of the project complies with methodological requirements, and good practice as defined.

In the opinion of the AENOR team, all necessary parameters required by the selected methodology are contained in the monitoring plan. They are clearly described, and the means of monitoring detailed in the plan comply with the requirements of the methodology. Tables in section 5 of the Joint PD&MR detail the different data variable to monitor along with the data unit, recording frequency, purpose of data, QA/QC, etc. In addition, the organizational structure of the company performing the monitoring of the project was

clearly stated in the Joint PD&MR. The data control and quality assurance were also defined in the project document. All these aspects were crosschecked during the remote interviews with the local management team and the CEO of the company. Thus, AENOR deems the monitoring plan complies with the applicable methodology.

The sampling design and stratification is also detailed in section 5 of the Joint PD&MR. The management units (stratum) were defined by plantation age and specie. On average the monitoring inventory was performed at 1,56% intensity. To estimate the total CO_2e content captured by the project plantations they were established 822 circular plots of 500 m² and 400 m² distributed in all the defined strata.

The sampling error and uncertainty were calculated using scientific literature and resulted within the quality parameters required. The uncertainty regarding the change in tree biomass was estimated using the following the uncertainty equation from Tool 14 of the CDM. A total of 3.38% uncertainty was estimated for the current monitoring period, according to the methodological tool there is no discount necessary (<10%).

The volume and biomass models used for each tree species estimation have been checked by the audit team. Models and data used for the estimation were considered appropriate and in compliance with the applicable methodology.

In opinion of the AENOR assumptions considered for sampling design are reasonable and credible and consistent with calculation. Thus, AENOR deems the sampling plan correct.

After the review of evidence provided by the PP, the interview, and communications with PP, AENOR confirms that monitoring arrangements described in the monitoring plan are feasible within the project design and that the means considered for the implementation, including data management, quality, and assurance control procedures, are sufficient to ensure that the GHG net anthropogenic removals achieved resulting from the proposed VCS project activity can be reported ex post and verified. Therefore, in opinion of the AENOR team, the PP will be able to implement the monitoring plan.

3.5 Non-Permanence Risk Analysis

Risk factor	Risk Rating	Findings and mitigation activities	CARs/CLs
Internal Risks			
Project Management: It is assessed using table 1 of the VCS AFOLU Risk Tool.	-4 (total may be less than zero)	a) N/A. Risk rating=0 is justified. b) N/A Risk rating=0 is justified. c) In accordance with the evidence provided, Management team includes individuals with significant experience in all skills necessary to successfully undertake all project activities. Risk rating=0 is justified. d) All parcels reforested are less than a day of travel from the MIM office. Risk rating=0 is justified. e) Management team (South Pole) includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting Risk rating=-2 is justified. f) Miro has an updated forest management plan.	Correction Action Request 03 (corrections done)

Risk factor	Risk Rating	Findings and mitigation activities	CARs/CLs
		Risk rating=-2 is justified.	
Financial viability: It is assessed using table 2 of the VCS AFOLU Risk Tool.	4 (total may not be less than zero)	a)-d) Project economic cash flow breakeven point is greater than 7 and up to 10 year from the current risk assessment. Risk rating=2 is justified. e)-f) Project has secured less than 15% of funding needed to cover the total cash out required before the project reaches breakeven. Baseline activities are subsistence driven. Risk rating=3 is justified. i) Project has not available as callable financial resources at least 50% of total cash out before project reaches breakeven. Risk rating=0 is justified.	No corrective actions or clarifications were requested.
Opportunity Cost: It is assessed using table 3 of the VCS AFOLU Risk Tool.	-2 (total may be less than zero)	a)-f) Baseline activities are subsistence-driven and net positive community impacts are demonstrated by PP. Risk rating=0 is justified. g) Not applicable. h) Project is protected by legally binding commitment to continue management practices over the length of the project crediting period. Risk rating=-2 is justified. i) N/A Risk rating=0 is justified.	No corrective actions or clarifications were requested.
Project Longevity: It is assessed using table 4 of the VCS AFOLU Risk Tool.	5 (total may not be less than zero)	a) Not applicable Risk rating=0 is justified. b) 50-year project longevity Risk rating=5 is justified.	No corrective actions or clarifications were requested.
Total internal risk=3 (total may not be less than zero)			
External Risks			
Land Tenure and resources access/impact: It shall be assessed using table 6 of the Risk Tool.	0 (total may not be less than zero)	a) Not applicable b) Ownership and resource access/use rights are held by different entities. Risk rating=2 is justified. c) There are no disputes over land tenure or ownership of the project area in more than 5 % of the project area nor disputes over access/use rights (or overlapping rights). Risk rating=0 is justified. d) There exist disputes over access/use rights. Risk rating=5 is justified e) Not applicable. f) Project area is protected by legally binding commitment to continue management practices that protect carbon stocks over the length of the project crediting period Risk rating = -2 is justified g) Mitigation: grievance mechanism for complaints, suggestions and requirements set. Risk rating = -2 is justified	No Corrective Actions or Clarifications were requested.

Risk factor	Risk Rating	Findings and mitigation activities	CARs/CLs
Community engagement: It shall be assessed using table 7 of the Risk Tool.	10 (total may be less than zero)	a) All communities are aware of the project Risk rating=0 is justified. b) Several public participation activities were carried out by the company as part of the company's land acquisition and Environmental and Social Impact Assessment (ESIA). Risk rating=5 is justified. c) Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area Risk rating= -5 is justified.	No Corrective Actions or Clarifications were requested
Political Risks: It shall be assessed using table 8 of the Risk Tool.	0 (total may not be less than zero)	a-e) Ghana presents 0.02 according to the World Bank Institute´s Worldwide Governance Indicators. AENOR verified the value and reliability of source. Risk rating=2 is justified. f) Ghana receives funding for REDD+ readiness from the FCPF, UN-REDD, or other bilateral or multilateral donors and is part of Non-Annex I which includes all non-Annex I UNFCCC signatory Parties, including Brazil. Risk rating=-2 is justified.	No Corrective Actions or Clarifications were requested.
Total external risks=10 (Total may not be less than zero)			
Natural risks			
Fire Risk: It shall be assessed using table 10 of the Risk Tool.	LS*M= 1	Insignificant. Less than every 10 years likelihood. Thus LS= 2 is reasonable. Mitigation (M) measures: Miro Company is prepared for fire prevention, monitoring and control since has it considered in their management plan, has the manpower trained for the purpose and the equipment and alert system to manage fire Then, M=0.5 is reasonable.	No Corrective Actions or Clarifications were requested
Pest and disease outbreaks: It shall be assessed using table 10 of the Risk tool.	LS*M=2.5	Devastating (50% to less than 70% loss of carbon stocks) Every 25 to less than 50 year Thus LS= 20 is reasonable. Mitigation (M) measures: The Company actively employs a range of preventative and control methods to combat pests and disease. Within the nursery, the Company aims to keep conditions as sanitary as possible to ensure that the planting stock is free of pests and disease. There is a procedure established for Pest Control Then, M=0.5 is reasonable.	Correction Action Request 03 (corrections done)
Extreme weather: It shall be assessed using table 10 of the Risk tool.	LS*M=2	Insignificant. Less than every 10 years likelihood. Thus LS= 2 is reasonable. Mitigation (M) measures: N/A Then, M=1 is reasonable.	No Corrective Actions or Clarifications were requested

Risk factor	Risk Rating	Findings and mitigation activities	CARs/CLs
Geological risks: It shall be assessed using table 10 of the Risk Tool.	LS*M=0	No carbon stock losses expected to be cause by geological risks. Thus LS= 0 is reasonable. Mitigation (M) measures: none. Then, M=1 is reasonable.	No Corrective Actions or Clarifications were requested
Other Natural Risks	N/A	N/A	No Corrective Actions or Clarifications were requested
Total natural risks=5.5			
OVERALL RISK RATING=1+5+13=19.			

The non-permanence risk deduction to be applied for the project is 19%.

AENOR has checked that information provided in the Non-Permanence Risk Report is consistent with the support documents provided. AENOR deems that information provided is reliable and appropriate. Thus, the overall risk rating is credible and realistic.

4 VERIFICATION FINDINGS

4.1 Accuracy of GHG Emission Reduction and Removal Calculations

All calculations of greenhouse gas emission reductions and removals were checked by the audit team. No errors were discovered that materially affect the stated greenhouse gas emission reductions and removals of the project during the monitoring period. The methods used to estimate greenhouse gas benefits of the project were consistent with the methodology and the validated part of the project.

Baseline emissions

In the Project, the baseline Net GHG removals by sinks is zero as it is explained in this validation and verification report. AENOR has checked and confirmed that this amount of baseline removals are zero and are in conformance and have followed the methodology of the project.

Project emissions

Project Emissions considers tree biomass, dead wood and litter.

To estimate the total CO_2e content captured by the plantations with a sampling error of 10% or less, circular plots of 500 m2 were established and stratified sampling was used. To estimate the tree biomass literature models were used for all the tree species planted (*Acacia mangium, Eucalyptus pellitea, Tectona grandis, Corymbia citridora, Gmelina arborea*). These models were selected according to Chapter 1.13 (Conditions Prior to Project Initiation) aiming for the most credible and accurate models.

Carbon in dead wood and litter was calculated using equations 9 and 15 of the tool "A/R Tool 12 estimation of carbon stocks and change in carbon stocks in dead Wood and litter in A/R CDM projects activities" of the AR-ACM0003 methodology, which accepts the use of a conservative default value, which relates the carbon content (in dead wood and litter) as a percentage of the total carbon in the tree's biomass.

$$CDW,i,t = CTREE,i,t \; x \; DFDW$$

Where,

$\boldsymbol{CTREE, i, t}$: Carbon stock in the biomass of trees in stratum *i* at a time point in year *t* (tCO_2e). Conservative default value expressing carbon stock in dead wood as a percentage of carbon stock in tree biomass (tCO_2e).

$$CLI,i,t := CTREE,i,t \; x \; DFLI$$

Where,

$\boldsymbol{CLI, i, t}$:| Leaf litter carbon stock in stratum *i* at a time point in year *t* (tCO_2e). Conservative default value that expresses the carbon stock in the litter as a percentage of the carbon stock in the tree biomass (tCO_2e).

The tool "Tool for the estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activity Version 1.1.0" was applied to estimate the soil organic carbon (SOC) stocks, as suggested by the tool. The increase in SOC content in the project scenario takes place at a constant rate over a period of 20 years starting from the year of planting.

The initial SOC stock at the start of the project is estimated as follows:

$$SOC_{INITIAL,i} = SOC_{REF,i} \times f_{LU,i} \times f_{MG,i} \times f_{IN,i}$$

Where,

$SOC_{INITIAL,i}$ SOC stock at the beginning of the A/R CDM project activity in stratum *i* of the areas of land; t C ha^{-1}

$SOC_{REF,i}$ Reference SOC stock corresponding to the reference condition in native lands (i.e.: non-degraded, unimproved lands under native vegetation normally forest) by climate region and soil type applicable to stratum *i* of the areas of land; t C ha^{-1}

$f_{LU,i}$ Relative stock change factor for baseline land-use in stratum *i* of the areas of land; dimensionless

$f_{MG,i}$ Relative stock change factor for baseline management regime in stratum *i* of the areas of land; dimensionless

$f_{IN,i}$ Relative stock change factor for baseline input regime (e.g. crop residue returns, manure) in stratum *i* of the areas of land; dimensionless

i 1, 2, 3 strata of areas of land; dimensionless

The following table indicates the project scenario emissions removals.

Year	Strata	Average biomass (AGB+BGB) (t/tree)	Dead wood (ton/strata)	Litter (ton/strata)	Total biomass (ton/Strata)	C Tree (tCO2e/stratum)	SOC (tCO2e/stratum)	Cdw (ton/strata)	CLi (ton/strata)	Total Cabon (ton/strata)
2016	1.1	0,05	751	125	12513	21565	117	1294	216	23191
2016	1.2	0,03	1066	178	17766	30616	570	1837	306	33329
2016	1.3	0,02	312	52	5192	8948	242	537	89	9816
2016	1.4	0,06	587	98	9783	16859	114	1012	169	18153
2017	2.1	0,06	533	89	8884	15310	100	919	153	16,482
2017	2.2	0,02	563	94	9378	16161	286	970	162	17,578
2017	2.3	0,03	10	2	172	296	6	18	3	323
2017	2.4	0,04	123	21	2053	3538	32	212	35	3,817
2017	2.5	0,07	201	34	3355	5782	31	347	58	6,218
2018	3.1	0,04	483	81	8058	13887	107	833	139	14,966
2018	3.2	0,02	765	128	12756	21983	439	1319	220	23,961
2018	3.4	0,03	100	17	1665	2869	37	172	29	3,107
2018	3.5	0,03	158	26	2638	4546	48	273	45	4,913
2018	3.6	0,03	225	37	3743	6451	82	387	65	6,985
2019	4.1	0,04	115	19	1912	3296	18	198	33	3,545
2019	4.2	0,01	375	63	6253	10776	186	647	108	11,716
2019	4.5	0,02	720	120	12001	20681	186	1241	207	22,315
Total	**Total**	**0,59**	**7087**	**1181**	**118,122**	**203,564**	**2600**	**12,214**	**2036**	**220,414**

A gross total of 220,414 tCO2e was achieved during the current monitoring period, with no discounts from permanence. This period goes from the start date (24/03/2016) up to 01/11/2020.

Leakage

As mentioned above leakage is not expected to occur in the project area due to the project activities, so it is deemed to be zero.

Net GHG Emission Reductions and Removals

The following table summarizes the results.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (19%)	VCUs eligible for Issuance
2016	0	0	0	0	0	0
2017	0	21,122	0	21,122	4,013	17,109
2018	0	35,929	0	35,929	6,827	29,102
2019	0	62,894	0	62,894	11,950	50,944
2020	0	100,469	0	100,469	19,089	81,380
Total	0	**220,414**	0	**220,414**	**41,879**	**178,535**

The total GHG benefit calculated as the sum of stock changes along the monitoring period (16/05/2016 to 01/11/2020) is 230,762 tCO2e. The overall non-permanence risk rating was 19%. Therefore, the total number of credits to be deposited in the buffer account is 41,879 VCUs and the total VCUs to be issued are 178,535 VCUs.

AENOR reproduced the calculations to achieve the same results and deems they are depicted clearly and correctly in the provided sheets. The AENOR verification team was able to trace calculations directly from the data sources of inventory´s field measurements. Formulae used are in compliance with monitoring plan, Joint PD&MR section and methodology used. The default values used to determine the parameters are appropriate. Thus, the net amount of VCUs to be issued is accurate and realistic.

In order to calculate the above terms, the monitoring report details the data and parameters used during the verification process. For each of them, AENOR checked its accuracy, consistency, and reliability by reproducing the spreadsheets calculations, verifying the correctness of formulae and methods used and crosschecking the data values with sources (Appendix 1).

AENOR carried out a deep review of the monitoring report section and the calculations.

AENOR verified the consistency and accuracy of each parameter detailed in the lists below by crosschecking the information in the MR section with the information in the PD section, as well as checking values and reproducing the calculations in the spreadsheet calculation package and did not find inconsistencies between them after the closing of CARs and CLs requested. Therefore, AENOR deems that values reported for the parameters are accuracy and consistent.

Moreover, AENOR also verified a complete GIS package provided to cross check the information with data values used in calculations and monitoring report. Other default values used are from sources well accredited and validated at validation stage.

AENOR did not find inconsistencies between the Joint PD&MR and spreadsheet calculation.

The following table summarizes the data and parameters monitored during the monitoring period and used by the PP to calculate the GHG emission removals, which has been assessed by AENOR:

Data/Parameter monitored	Value applied	Assessment procedure and result
DBH	Various values	• It is measured by project proponent II in temporal sample plots using Masser Excalliper, • Correctly inputted in the calculation spreadsheets.
Ht (height)	Various values	• It is measured by project proponent in temporal sample plots using Vertex IV Hipsometer (accuracy +/-10 cm. Measuring tape: Accuracy +/- 1 cm) • Correctly inputted in the calculation spreadsheets.
Plot location	Various values	• Project proponent measurements. The geographic coordinate of each monitoring plot (using GPS of the calliper with an accuracy of 0.5 metres, GPS navigator), according with the management objectives showed on the monitoring plan.
Plot Area A_{plot}	500 m2 (9.8 m) and 400 m2 (20 m)	• Data provided from PP field monitoring. The plot area is measured using a Vertex IV Hypsometer to guarantee quality and accuracy in the estimations, according to the management, objectives showed on the monitoring plan Correctly inputted in the calculation spreadsheets.

In order to verify the accuracy and consistency of parameters monitored and used to calculate the removals achieved for the monitoring period, the AENOR verification team reproduced the calculations checking the correctness of the formulae applied and assumptions used, when applicable and that values used matched with data sources.

AENOR checked that the list of parameters to be monitored was complete and consistent with information in the monitoring plan of the Joint PD&MR document.

After a deep and thorough review and reproduction of calculations and the corresponding tracks to the other spreadsheets, AENOR deems the parameters monitored are correct, reliable, and consistent. Information in the monitoring report and it complies with the Joint PD&MR, the calculations provided and the applicable methodology. Then, the results showed in the monitoring report are reliable, consistency and accuracy.

4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

To estimate the total CO_2e content captured by the plantations, with a sampling error of 10% or less, circular plots of 500 m² and square plots of 400 m² were established, using stratified sampling (systematic or random). This sampling was selected because it can control the effect on the variance of the estimates generated by the differences between species and farms.

The equipment used to collect the DBH´s and the plot coordinates is a digital calliper from the brand Masser Excalliper II. This machine guarantees +/-0.1 cm error capturing diameter, and 1 m of error capturing the plot coordinate. The equipment used to measure the heights is a digital hypsometer from the brand Haglof, Vertex IV® series. This machine guarantees +/-10 cm error capturing heights. With the same machine, the plot diameter is measured with a +/-10 cm error. It was demonstrated by the monitoring crew that training to use the of this equipment is given to provide the monitoring crew members with the tools to make decisions in the fields.

AENOR has verified that monitoring crews implemented the monitoring plan as it is established in the Joint PD&MR. AENOR also could evidence during on site visit that key workers are fully involved in monitoring events (training, measuring, archiving, reporting, quality control, etc.). QA/QC procedures are considered strict at identifying, reviewing, and handling inconsistencies found.

Roles and responsibilities are clearly identified in the project document as well as QA/QC procedures. Thus, the use of these procedures monitored to ensure that net anthropogenic GHG removals by sinks are measured and monitored precisely, and are credible, verifiable, and transparent. Training was held for all relevant personnel on all data collection and analysis procedures.

Regarding quality control during the data collection in field, the follow measures have been design:

- The overall accountability for the thinning and thinning control processes being carried out correctly and efficiently remains with the Planning Forester/Manager.
- The General Manager will approve the analyses and give the final decisions regarding thinning (or remarking) by authorizing the inventory analysis record in Microforest.
- The assessment shall become a permanent record in the database.
- The concerned Forester is responsible for the effective and timeous execution of the marking and thinning operations.
- The Planning Forester/Manager is responsible for the inventory process, comprising of the planning and execution, and reporting of the inventory by their team. The data analysis and presentation of the results, with recommendations, to the Plantation Manager for final approval and the incorporation of the inventory data into the plantation database.

With the inventory and analysis of the data, the Planning Forester/Manager will give special attention to the following:

a) The correct execution of the inventory and data collection by the team

b) The statistical validation of the inventory, i.e.:

c) sample size (3%-10% by area depending on compartment size and variability)

d) keeping the standard error of the individual components (DBH, Height, and SPH) as far as possible to 5% or lower and the combined standard error (DBH, Height, SPH, and Volume regression) to 10% or lower

e) Acceptable DBH/height regression

f) The analysis of the marking process. The following must be checked in detail on the analysis sheets

g) Increase in mean DBH of the remaining stand (thinning from below)

h) Improvement (narrowing) of DBH distribution after thinning

i) More uniform SPHA distribution in the stand after thinning

j) SPHA after thinning must be as prescribed in the thinning policy

k) Volume from analysis must be made available to the General Manager

l) Adjust thinning regime prescriptions where applicable, using the results of the inventories

m) Capture the additional information (comments on weeds and pests) that has been gathered by the inventories in the compartment register (MF).

During the remote interviews, the AENOR team discussed the implementation of quality control when the project team cross checked the accuracy of the data collected in the field and when the data was translated to the spreadsheets, with the project developer (South Pole), the management team onsite, and representatives of the monitoring crews. Additionally, a video demonstration of the monitoring activities in the field were provided to the audit team. Original data sheets were provided to the verification team of AENOR. A random sample of these were selected and traced through to the corresponding excel spreadsheets with no errors observed. Finally, data management and archival system is also detailed in the Joint PD&MR.

Roles and responsibilities along with data management and archival system are also detailed in the monitoring report and other supported documents.

Interviews with the PP, South Pole consultants and the management team in the project area and inspection of data and results demonstrated that the PP possess all the competencies required for reporting of GHG emissions reductions on accurate way.

Data presented to the audit team were clear and coherent and processing steps could be traced to the corresponding sections of the methodology and monitoring plan with transparency.

The monitoring plan provides means for internal data review and quality control, and the data presented by the project proponent included the results of these internal assessments. AENOR reviewed the different procedures applied by Miro and AENOR considers that information provided is sufficiency and the quality of that information is appropriate to determine the GHG removals.

During the remote process, AENOR verified the enforcement of the quality assurance and quality protocols and checked that all instruments used for the whole monitoring period were checked and in good conditions to be used. Furthermore, AENOR performed a consistency check in order to verify the consistency of the previous measurement and the re-measurement, and to verify the correctness of the reported results.

5 VALIDATION AND VERIFICATION CONCLUSION

AENOR has performed the validation and the verification of the Miro Company ARR Project Reforestation of Degraded Forest Reserve in Ghana (West Africa) and has verified that the project complies with the Verified Carbon Standard version 4.0 without qualifications or limitations. The project is located in Ghana and covers more than 10,000 hectares.

The validation and verification process was performed on the basis of all issues and criteria of VCS. The conclusions of this report show that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation and verification.

The verification assessment covered the monitoring period from 24-March-2016 to 01-November-2020 and verified that calculated emission removals were achieved during the monitoring period with a reasonable level of assurance.

AENOR is able to issue a positive verification opinion for the 220,4142 tCO_2e as reported in the Joint project description and monitoring report for the reporting period 24-March-2016 to 01-November-2020. The overall non-permanence risk rating was 19%. Therefore, the total number of credits to be deposited in the buffer account is 41,879 VCUs and the total VCUs to be issued are 178,535 VCUs.

Verification period: 24-March-2016 to 01-November-2020

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)	Buffer pool allocation (19%)	VCUs eligible for Issuance
2016	0	0	0	0	0	0
2017	0	21,122	0	21,122	4,013	17,109
2018	0	35,929	0	35,929	6,827	29,102
2019	0	62,894	0	62,894	11,950	50,944
2020	0	100,469	0	100,469	19,089	81,380
Total	0	**220,414**	0	**220,414**	**41,879**	**178,535**

Overall non-permanence risk rating: 19%

VCUs buffer to be deposited: 41,879 t CO_2e.

Total VCUs to be issued: 178,535 t CO2e.

Date: 28 Sept 2021

Miguel López Delgado
Validation and Verification Leader

APPENDIX 1: LIST OF DOCUMENTS

N°	Title
1	Joint PD&MR Documet_MIRO_Ghana; (210927_PDD_Miro_Ghana)
2	PDD Supports Folder Annex -Library (PD&MR supporting research and investigations documents referenced) -PO Information • EPA Licenses • ESIA • Land Leasing • Project Location -Stakeholder consultation (invitation letters, minutes of the meetings, attendance lists, materials used during the meetings - Appendix • Eligibility _AR_MIRO – Ghana • LandCover_2014_AR_MIRO_Ghana.docx • TROP-SUBTROP_Wetlands_2016_CIFOR.docx - NPRT - Ghana • NPRR_Miro Ghana • VCS-Risk-Report Calculation Tool • Internal, External, Natural Risks folder
3	Estimations: Ex-ante and Ex-post calculation spreadsheets
4	Shapes (GIS DATABASE Project area, plantation eligibility, planted area and Wetlands)
5	Audit evidence Video testimonios and recorded demonstrations
6	Findings' responses supporting documentation

APPENDIX 2: REMOTE AUDIT

REMOTE AUDIT SPECIFICATIONS

Due to the exceptional situation caused by the COVID-19 crisis and the travel restrictions established by governments for safety reasons, it is not possible to carry out a site visit to verify the implementation of projects' activities and monitoring plans.

In accordance with VERRA's COVID-19 Travel Guidance for Projects (dated 18 March 2020) and considering that the VCS Program does not explicitly mandate site visits, provided that a reasonable level of assurance is achievable by other means, AENOR as VVB will carry out a remote audit that will ensure the achievement of the assurance level required by the VCS Standard.

The remote audit will be based on the following auditing techniques:

- Document review and cross checks between the information provided in the MR, the PD and supporting information and evidence provided by the PP.
- Review, based on the selected methodologies, tools and the other applied methodological regulatory documents, of the appropriateness of formulae and accuracy of calculations.
- Telephone, teleconference and/or e-mail interviews with relevant stakeholders and personal responsible for the implementation of project activities and the elaboration of project's documents.
- Cross checks between information provided by interviewees to ensure that not relevant information has been omitted.

The dates for the remote process were proposed for the week of 15th to 19th February 2021.

KEY STAKEHOLDERS TO APPROACH

Whenever possible, considering the logistical availability and the relevant preventive measures given the current sanitary situation, live video interviews will be the preferred mean of communication with the stakeholders. In case that this mean is not available, video recordings with the testimonies of the stakeholders will be use as mean of verification. The audit team will provide the set of questions to answer by the recorded stakeholders.

Following table shows the hey stakeholders to approach during the remote process specifying the verification manner, after its feasibility was assessed considering the local context.

Stakeholder Group	Representative from Entity/Group	Topic	Verification mean
Project Proponent	Miro Forestry Ghana Ltd	Project Implementation Project management	Videocall
	The National Interest Ltd (NICOL)	Project Funding	Acknowledgement letter

Stakeholder Group	Representative from Entity/Group	Topic	Verification mean
Project Developer	Swiss Carbon Value Ltd	Project Design/ Documentation/ Geodatabase/ Etc.	Constant communication during the audit process
Local Assemblies	Representative(s) from the Asante-Akyem North, Sekyere Kumawu, Sekyere Afram Plains and Sekyere Central Municipal Assemblies	Project Knowledge/ approval	Acknowledgement official communication
Forestry Commission of Ghana	National Head Office	Reserve lands custody & project approval	Videocall/ Acknowledgement official communication
Government District Forestry Agency	Kumawu and Mampong Forestry District Officers		
Traditional Landowners	Representative(s) of the people of Agogo, Kwamang, Mampong and Kumawu Traditional areas	Land use and tenure Rights/ Project involvement	Videocall/ Video-testimonies/ Written testimonies
Project Local Management team	MIRO Project staff	Project Implementation Local Coord. Field activities, etc.	Videocall
PP local staff/ community members	Consultation team / Community members facilitating	Project consultation & Local participation Project communication Project Risks	Videocall/ Written testimonies/ Video testimonies
	Traditional Councils, Municipal, environmental authorities and community members participating in the consultation process		
Project Beneficiaries	Local Authorities in the project area (Chiefs, subchiefs, village elders, others)	Project acknowledgement	Written testimonies/ video testimonies
	Household Owners inside the project area	Project Implementation Benefits-Risks/ Communication	
	Household owners outside the project area		

Stakeholder Group	Representative from Entity/Group	Topic	Verification mean
Project monitoring team	Local team Team leader & Assistants Local workers crew representative(s)	Soil and Biomass (tree& shrubs) inventories	Videocall & Video demonstration of monitoring activities on field.
	Technical Team	Data Control, internal audit and QA/QC	

PROJECT ACTIVITIES TO VERIFY

The following project activities are to be verified via remote audit. The project proponent shall assess the feasibility of acquiring the required evidence and propose other means of verification if necessary due to logistic reasons.

Activity	Stakeholder Group	Description	Val/Ver mean
Management Systems	MIRO Project staff	Project Local Management team -*Microforest* -Miro Management Systems -GIS database	Videocall
Planning	MIRO Project staff/ Other local participants/ Community members	-Land mapping and planning -Management of natural areas -Conservation areas -Management of commercial areas	Videocall/ Video-demonstration on field
Silviculture	MIRO Project staff/ Other local participants/ Community members	Silviculture activities (nursery, slash management, land preparation, weed control, etc.)	Videocall/ Video-demonstration on field
Forest Protection	MIRO Project staff/ Other local participants/ Community members	Fire & Pest and disease control	Videocall/ Video-demonstration on field
Harvesting	MIRO Project staff/ Other local participants/ Community members	Forest Roads, Thinning, etc.	Videocall/ Video-demonstration on field

Research	MIRO Project staff/ Other local participants/ Community members	Establishment of Trial blocks/ Soil Fertility management/ FSD/ Forestry Research Institute of Ghana	Videocall/ Documental evidences/ Video-demonstration on field

SPECIFICATIONS ON LIVE TESTIMONIALS (VIDEOCALLS)

The dates for the remote process were proposed for the week of 15th to 19th February 2021.

Following table shows the hey stakeholders to whom to directly interact during the remote process considering the local context and connection possibilities.

Stakeholder Group	Name/Role	Topic	Verification mean
Project Proponent	Andrew Collins MIRO CEO	Project Implementation/ Project Management Systems	04/02/2021 Videocall 1 h
Forestry Commission of Ghana	Commission Officer	Reserve lands custody & project approval	16/02/2021 Videocall 1/2 h
PP local staff	PP local staff/ Consultation team/ Community members facilitating and participating	Project consultation/ Local participation Project communication/ Project Risks	17/02/2021 Videocall 1 h
Project monitoring team	Local team: Team leader, assistants and local workers crew	Soil and Biomass (tree& shrubs) inventories/ Land Mapping and Planning/Data Control, internal audit and QA/QC	17/02/2021 Videocall 1 h
	Technical Team in field and in office		

Stakeholder Group	Name/Role	Topic	Verification mean
MIRO Project staff and other local participants/community members in the project activities	PP local staff and community members involved in the project activities: Silviculture/ Forest Protection/ Harvesting/ Research	Project Activities Implementation & monitoring period results	16/02/2021 Videocall 1 h

The time described for the interviews may vary slightly depending on the fluidity and dynamics of the interviews.

SPECIFICATIONS ON VIDEO TESTIMONIAL EVIDENCE

Following table shows the video testimonies to collect for the remote assessment, in order to replace videocalls that are not feasible to carry out because of the project area conditions or current restrictions.

Stakeholder Group	Name/Role	Topic	Verification mean
Traditional Landowners	Representative(s) of the people of Agogo, Kwamang, Mampong and Kumawu Traditional areas	Land use and tenure Rights/ Project involvement	Video testimonies/ Written testimonies
Project Beneficiaries	Local Authorities in the project area (Chiefs, subchiefs, village elders, others)	Project acknowledgement	Video testimonies/ Written testimonies
	Household Owners inside the project area	Project Implementation Project Benefits/ Communication	
	Household owners outside the project area		
Project Monitoring Team	Project Monitoring Team	Monitoring procedure, techniques, equipment, etc.	Video demonstration
MIRO Project staff/ Local participants or community members	Community members, local staff participating in: Management Systems/ Planning/ Silviculture/ Forest Protection/ Harvesting/ Research	Project Implementation/ Project Activities	Video testimonies /Video demonstration

APPENDIX 3: FINDINGS

Corrective action requests (CARs)

CAR ID	01	Date: 03/03/2021
Description		
• In section 1.13 please demonstrate that the project has not been implemented to generate GHG emissions for the purpose of their subsequent reduction, removal or destruction. • The version of the AFOLU Non-Permanence Risk tool indicated in the project document is not the one used, nor the latest version. Please update the document accordingly. • Please update table 50 of the project document. Values used for the plot area are not coincident with ex-ante spreadsheet data. • Table 51 and in its eighth column states tones/plot as the units of the biomass measured for the uncertainty figures, although the actual unit used was tons/ha as per calculations. Please update the project document and spreadsheet accordingly.		
Project proponent response		**Date: 21/04/2021**
• The project has not been implemented to generate GHG emissions for the purpose of their subsequent reduction. The project has been established in lands that do not meet the definition of forest, as per demonstrated by the eligibility analysis included in the section 1.3. In addition, as mentioned in the ESIA study, the land corresponds to degraded areas. • The document has been updated indicating the current version of the Non-Permanence Risk tool (V4). • The table 50 was updated with the correct value per plot. • The units in the biomass column for the uncertainty figures in Table 51 were amended, indicating ton/ha instead of ton/plot, also the spreadsheet was updated accordingly.		
Documentation provided by Project proponent		
Updated PDD with adjustments in track-change.		
VVB Assessment		**Date: 28/04/2021**
• Project Developer updated section 1.13 of the project document and no further corrections were needed. • References in the Joint PD&MR to the NPRR version used were corrected in section 3.1, but not in section 3.2. Please update the project document accordingly. • Table 50 of the project document was corrected with correct values per plot, no further corrections were needed. • Units in table 51 and in the uncertainty table in the spreadsheet were corrected, no further correction was needed.		

Project proponent response	Date: 12/05/2021
The reference of the version of the NPR (version 4) was updated in the section 3.2	
Documentation provided by Project proponent	
Corrected version of the PDD in track-changes	
VVB Assessment	**Date: 19/05/2021**
The project developer updated the Joint PD&MR document according to what was required in this CAR. No further corrections were needed. Thus, this CAR is closed.	

CAR ID	02	Date: 03/03/2021
Description		
• Section 6 is not in the VCS PDD template v4.0. For joint validation and verification purposes, please update the PDD to the Joint PD&MR document. • Table 54 does not include the SOC data. Please update said table. • Please specify the actual monitoring period (day-month-year).		
Project proponent response		**Date: 21/04/2021**
• Section 6 was updated following the instruction of the template Joint PD&MR document. • The SOC data was included in the Table 53. Table 54 was changed according to the requirements of the template. • Actual monitoring period: From to 24/03/2016 to 03/11/2020. This was added to the final part of the section 6.5		
Documentation provided by Project proponent		
Updated PDD in track changes.		
VVB Assessment		**Date: 28/04/2021**
• Please update the project document using the VCS Joint PD&MR template v4.0, update the front-page (no header) and info box with actual version and complete date of issue (dd-mm-yyyy). • Tables 53 and 54 were updated according to the template and found correct, no further action is requested in this regard.		

• Information regarding the monitoring period (dd-mm-yyyy) was not found in section 6.5 of the Updated project description document in track changes, or final dated 210420. Monitoring period indicated in the NPRR was 24-03-2016 to 1-11-2020. Please clarify the monitoring period end date and update section 6.5 of the project document and NPRR accordingly.

Project proponent response	Date: 18-05-2021
• The front-page of the PDD was updated with actual version and date of issue • The monitoring period end date is 01-11-2020 and corresponds to the finishing date of the forest inventory for the compartments included in this first verification. The section 6.5 of the PDD was updated.	
Documentation provided by Project proponent	
- Updated version of the PDD in track changes	
VVB Assessment	**Date: 19/05/21**
The project developer provided an updated version of the project description and monitoring report document and no further corrections were needed. Thus, this CAR is closed.	

CAR ID	03	Date: 03/03/2021
Description		
In relation to the Non-permanence Risk assessment: • Please update the section e) of the internal Risk with the actual SP team managing the project. • Please explain the selection of the likelihood for the pest and disease outbreaks analysis • Please update table representing the total calculation of VCUs • Please update the total net removals expressed at the end of the NPRR and please specify the actual monitoring period date (day-month-year start/end).		
Project proponent response		**Date: 21/04/2021**
• The referenced section has the actual team that manages the project: Jhoanata Bolívar, Maria Fernanda Buitrago, Lina Vanesa Espitia. • The selection of the likelihood for the pest and disease outbreak analysis was revised and new evidence was provided to justify the score. The Significance was reduced to "Minor" but the likelihood was increased to "Less than 10 years", based on the following elements:		

Significance: Minor (5% to less than 25% loss of carbon stocks)

The project has several species distributed in several compartments with different ages. The susceptibility to pest and disease attack of each species and depending on the age is different. In the case of an hypothetical attack of any pest or disease, the carbon stocks, it is nos expected that the affected area would be higher than 25%, since the compartments have different ages and the carbon accumulated would not be lost, but the growing may become slower. Besides, in a study that evaluated the global forest area disturbance from fire, insect pests, diseases and severe weather events, found that during 2015, 12,5% of the forest in Africa were affected by pests(1).

However, the Project Developer is well aware of the potential risks that are present in the region , as shown by some studies such as the study by (Mamle & Jolanda, 2015) which analyses new outbreaks of diseases and pathogens affecting tree plantations in Ghana that have been established under the National Plantation Forest Development Programme in the different forest districts of Ghana. The study found new records of exotic diseases without serious management of the pathogens by the plantation developers.

Additionally, some of the most common species in the project are eucalyptus, which in general present low levels of disease, with less than 1% of affectation observed in eucalyptus plantations. However, Cylindercladium leaf blight was common in eucalyptus trees in APSD Ghana Limited's plantations, and a species of Calonectria was also found to cause rot in the nursery.

During disease surveys of Eucalyptus grandis, E. camaldulensis and E. dagambae plantations in the Ashanti, Central and Eastern Regions of Ghana, stem cankers on mature E. dagambae, which resemble that caused by species of Chrysoporthe, were observed in a single compartment near Kumasi (Roux and Apetorgbor, 2009). Among the plantations established, disease problems started emerging on Tectona grandis (Teak) and Cedrela odorata (Cedrela) plantations. Plantation developers reported that disease problems in these plantations are increasing in the Anhwiaso South, Kwamisa, Opro, Tano Nimri, Mamiri and Afram Headwaters forest reserves.The impact of pests and disease vary, but can lead to reduced growth rates, reduced yields, lower quality timber and total crop failure – all of which have a significant financial impact (see "Pest & Disease Control" section of the PD).

As a conclusion, although there is some documented presence of different pests and disease in the country, the level of damage is minor, and depends mainly on the species. Since the project comprises several species, this contributes to the diminish of the significance.

Likelyhood:

According to FAO's disturbance statistics report on disturbances affecting forests and another wooded land in Ghana during the period 1990 to 2000, there is no evidence of disturbance by insects, pests or diseases. No recent studies were found. Thus, since the project takes a prevention approach, the likelihood selected is the most conservative one.

- The table has been updated with the current results of the monitoring.
- The total net removals expressed and the actual monitoring period have been updated.

Documentation provided by Project proponent
● Updated version of the NPR in track changes. ● Documents: 1) Global forest area disturbances 2015 2) Pest and diseases list 3) Pest Control Prescription.

VVB Assessment	**Date: 28/04/2021**
● Updated version of the NPRR was provided and its section e) of the internal Risk was corrected with the actual SP team managing the project. No more clarifications are requested. ● The selection of the likelihood for the pest and disease outbreaks analysis was justified and the NPRR updated accordingly. No more clarifications are requested. ● Table representing the total calculation of VCUs was updated and found correct in the updated NPRR. Therefore, no further actions are requested. ● The total net removals and the monitoring period dates were indicated in the updated NPRR, no further actions are requested in this regard. ● Please clarify end date of the monitoring period, see CAR 02.	

Project proponent response	**Date: 18/05/21**
The monitoring period ends on 01-11-2020 and corresponds to the finishing date of the forest inventory for the compartments included in this first verification.	

Documentation provided by Project proponent
Updated PDD in track-changes

VVB Assessment	**Date:19/05/2021**
Clarification regarding the end date of the monitoring period was provided by the project developer and no further clarifications or corrections were needed. Therefore, this CAR is closed.	

CAR ID	04	Date: 03/03/2021
Description		
In relation with the ex-post calculations, in the 6.ER ΔCt spreadsheet the column indicating $SOC_{al,t}$ was calculated using same number of years for the different stratum (different planting years). Please, update the formulae and correct the values obtained from the data in this column according to the update.		
Project proponent response		**Date: 21/04/2021**
The SOC SOCal,t was corrected using the number of years for each different stratum Column Y). The formulae in the column B (SOCal,t (tonnes C /stratum) were corrected in the tab: 6.ER ΔCt of the spreadsheet: 210409_Ghana_ExPost_mfb in the supporting documents.		
Documentation provided by Project proponent		
- Updated excel sheet with the ex-post calculations - Updated sections in the PDD related to monitoring in track-changes		
VVB Assessment		**Date: 28/04/2021**
SOCal,t formulae and values were corrected in the 6.ER ΔCt spreadsheet from the supporting document 210409_Ghana_ExPost. In addition, the project document was updated accordingly. Thus, this CAR is closed.		

Clarification requests (CLs)

CL ID	01	Date: 03/03/2021
Description		
• In section 1.2 of the project document, please clarify whether the project is a grouped project. • Regarding the ownership (section 1.7), please provide evidence of the potential renewal of the lease agreement of MIRO with the landowners and the Forestry Commission. • Please provide justification of the selected project start date. • Please provide evidence of the following sated in section 1.17.1 of the project document: *"Activity shifting leakage is limited since country's policies prohibit this…"* • Section 2.4 shall be updated with a summary of the public comment period results. • Please clarify why section 4.2.2. of the project document, where the Tree carbon estimation indicates section 8.2 of the methodology used, but formulas of section 8.1 are used. • Section 4.4 of the project document states an 18% deduction form the non-permanence risk assessment, while NPRR states an 19%.		
Project proponent response		**Date: 21/04/2021**
• The project is not a grouped project • The ownership of the project is guaranteed during the entire crediting period (30 years) and beyond. The potential renewal is stated in the land lease documents. • The project start date corresponds to the first stand established in the year 2016. The planting ticket of the compartment was added as new evidence. This file shows the actual performance of each planting activity (watering, spraying, slashing) for the first project's compartment established, compartment A6. • The statement was clarified and new evidence was included. • Public comments period went from March 3rd to April 2nd 2021, and no comments were received. • The section 8.2 was erroneously referenced. The actual formulas in section 8.1 were used. The PDD was amended. • The correct deduction is 19%. The Section 4.4 was corrected accordingly.		
Documentation provided by Project proponent		
Updated PDD in track changes.		
VVB Assessment		**Date: 28/04/2021**
• Project developer clarified that the project is not a grouped project. No other clarifications are requested in this regard.		

• The ownership of the project was demonstrated during the crediting period and beyond with the lease documents provided *"...for the term of 50 years from the commencement date thereof."* No further clarification was needed. • The project start date indicated in the project document was not found in supporting documentation provided. Please provide evidence of the selected project start date. • Section 1.17.1 of the project document was updated clarifying former statements. No further clarification was needed. • Section 2.4 of the project description and monitoring report document was updated with information of the actual public consultation period carried out. • The project developer provided clarification and updated section 4.2.2. No further clarifications were needed. • The project developer provided clarification and updated section 4.4 with corrected deduction as per VCS NPRR result. No further clarifications were needed. ❖ Please justify the project scale indicated in section 1.10 as per VCS requirement 3.9.1, and clarify the last statement of the section *"These average annual ERs does not incorporate the Long-term average applied"*

Project proponent response	**Date:12/05/2021**
• The supporting documentation provided as evidence for the start date includes: - Excel document: A6 Tickets proof of planting - Excel document: A6 Proof of enumeration These two documents show the dates and registries of the activities performed in compartment A6, such as soil preparation (slashing, spraying, watering), the actual planting, survival assessments and the working enumerations. These files come from the Microforest software, and they show the day 24/03/2016 as the planting date of this compartment. • The scale of the project is "Project", less than 300.000 VCU/year. The "Large Scale" clasification was incorrect, and was removed. • Concerning the statement "*These average annual ERs does not incorporate the Long-term average applied*", it was written before changing the ER Table (That did not include such calculation). It should have been removed when updating the section. Thus, the statement was erased since the current Table does include the long-term average calculation. That is why the ER goes only up to the year 2026.	
Documentation provided by Project proponent	
- Updated PDD in track-changes - Excel document: A6 Tickets proof of planting - Excel document: A6 Proof of enumeration	
VVB Assessment	**Date: 19/05/2021**

The project developer updated the Joint PD&MR document considering the requested. No further clarifications were needed. Thus, this CL is closed

CL ID	02	Date: 03/03/2021
Description		
• Please, provide docs supporting the volume and biomass models used for eucalyptus, teak, lemon-scented gum and gmelina. • Please provide Cochran (1997) and Gatz & Smith (1994) • Please provide the research Asiamah, et al., 2007.		
Project proponent response		**Date: 21/04/2021**
The requested documents are included in the supporting documents.		
Documentation provided by Project proponent		
- UST, P. (1994). Growth and biomass production of *Gmelina arborea* in conventional plantations in Ghana. Ghana Journal of Forestry, 1, 5. - Mattia, S. B., & Sesay, S. (2020). Ground Forest Inventory and Assessment of Carbon Stocks in Sierra Leone, West Africa. In Natural Resources Management and Biological Sciences - García_Florez, L *et al*. (2019). Developing biomass estimation models for above-ground compartments in *Eucalyptus dunnii* and *Corymbia* citriodora plantations. Biomass and Bioenergy 130. - Cochran W. (1977). Sampling Techniques. Third edition. John Wiley & Sons. - Gatz D & Smith L. (1994). The standard error of a weighted mean concentration. I. Bootstrapping vs other methods. Atmospheric environment. Vol. 29, No. 11, pp. 1185-1193, 1995.		
VVB Assessment		**Date: DD/MM/YYYY**
• The documents supporting the volume and biomass models used for eucalyptus, teak, lemon-scented gum and gmelina were provided. No further clarification was needed in this regard. • Cochran W. (1977) and Gatz D & Smith L. (1994) researches were provided. No further clarification was needed. • Please provide the research Asiamah, et al., 2007		
Project proponent response		**Date: 18/05/2021**

- The document referenced (Asiamah et al 2007) corresponds to the Chapter 2 (Soils of Ghana) of the document "Synthesis of soil, water and nutrient management research in the Volta Basin". The complete book is included in the supporting documents.
Documentation provided by Project proponent
- Synthesis of soil, water and nutrient management research in the Volta Basin

VVB Assessment	**Date:**
Project developer provided requested evidence and no other clarification were needed. Thus, this CL is closed.	