VALIDATION REPORT OF INNER MONGOLIA KEYIHE IFM (CONVERSION OF LOGGED TO PROTECTED FOREST) PROJECT

Document Prepared By China Environmental United Certification Center Co., Ltd.

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Prepared By	China Environmental United Certification Centre Co., Ltd.
Contact	Address: No.1 Yuhuinanlu, Chaoyang District, Beijing, China, 100029 Tel : 86-10-84665051 E-mail : cdm@mepcec.com Website : www.mepcec.com
Approved By	Zhang Xiaodan
Work Carried Out By	XUE Jinghua, ZHANG Huan, WU Xiuli

Summary:

Inner Mongolia Keyihe Forest Industry LLC has commissioned China Environmental United Certification Center Co., Ltd (CEC) to carry out a validation of Inner Mongolia Keyihe IFM (conversion of logged to protected forest) Project on the basis of all applicable VCS Standard Version 3.7 and the methodology VM0010 version 1.3 "Methodology for Improved Forest Management: Conversion of Logged to Protected Forest"

The validation scope is defined as an independent and objective review of the Project design document, the Project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the Project design and the baseline and monitoring plan; ii) follow-up interviews with Project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from contract review to validation report & opinion, was conducted using CEC internal procedures.

The first output of the validation process is 1 Corrective Actions Request (CAR) and 5 Clarification (CL). Project Participant took corrections and revised the project design document. The CAR and CL was successfully closed.

In summary, it is CEC's opinion that project, as described in the VCS PD version 03 dated 15/11/2017, meets all relevant VCS requirements. CEC thus requests the registration of the Project as a VCS Project activity.

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1 INTRODUCTION

1.1 Objective

Inner Mongolia Keyihe Forest Industry LLC and Beijing Shengdahuitong Carbon Management Co., Ltd.has commissioned China Environmental United Certification Center Co., Ltd (CEC) to validate the Inner Mongolia Keyihe IFM (conversion of logged to protected forest) Project (hereafter referred to as "the Project") owned by Inner Mongolia Keyihe Forest Industry LLC and Beijing Shengdahuitong Carbon Management Co., Ltd. (hereafter referred to as "the PP"), which is located in Oroqen Autonomous Banner, Hulun Buir City, Inner Mongollia Autonomous Region, P.R.C..

CEC as the validation/verification body (VVB) of the Project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

The objective of validation is to have a thorough and independent assessment of the proposed project activity against the applicable VCS requirements, in particular, the project's baseline, monitoring plan and the project's compliance with relevant VCS and host party criteria, in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the Project and its intended generation of emission reductions.

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the VCS project description (VCS-PD), the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against VCS requirements, UNFCCC rules and associated interpretations.

The validation is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

The validation is carried out on the basis of the following requirements, applicable for this project activity:

- VCS Program Guide, version 3.7, dated 21/06/2017
- VCS Standard, version 3.7, dated 21/06/2017
- Registration & Issuance Process, version 3.8, dated 21/06/2017
- VCS Validation and Verification Manual, version 3.2, dated 19/10/2016

- VM0010 "Methodology for Improved Forest Management: Conversion of Logged to Protected Forest" version 1.3, dated 28/04/2016

- Other rules and requirements

1.3 Level of Assurance

CEC has undertaken a reasonable assurance engagement in accordance with VCS requirements. It requires a reasonable level of assurance in validation that GHG assertions are free of material errors, omissions and misrepresentations. The validation conclusion is based on the VCS-PD, supporting evidences made available to the verifier and information collected through performing interviews and during the on-site inspection

1.4 Summary Description of the Project

The Project is located in Oroqen Autonomous Banner, Hulun Buir City, Inner Mongollia Autonomous Region, P.R.C., implemented by Inner Mongolia Keyihe Forest Industry LLC. The project has 20,526ha commercial forest. Before the implementation of the project, the forest within the project area was designed and planted as commercial forest. The project will converse 20,526ha commercial forest from logged to protected. The implementation of the project will result in significant carbon sequestration and improve the sustainable development of ecological system. The project is expected to generate 3,008,381 tCO_2e emission reductions within the crediting of 30 years starting from 01/01/2013 with the average annual emission reductions of 100,279 t CO_2e, without buffer deduction, the annual and the total emission reductions are 128,563 and 3,856,915 tCO_2e respectively.

It applies methodology *VM0010* version 1.3 “Methodology for Improved Forest Management: Conversion of Logged to Protected Forest”. The protected species are Brich and Larch.

The Project Start Date is 01/01/2013. The notice on the forbidding commercial logging was issued by Keyihe Forestry Bureau on 18/12/2012. It is indicated in this notice issued by local forest authority that from 01/01/2013 the commercial timber harvest was strictly forbidden in the project area.

2 VALIDATION PROCESS

2.1 Method and Criteria

The overall validation, from Contract Review to Validation Report & Opinion, was performed using CEC internal procedures.

CEC validated the project against the requirements set in VCS standard version 3.7.

2.2 Document Review

The VCS Project Description (VCS-PD) was submitted by Inner Mongolia Keyihe Forest Industry LLC. and Beijing Shengdahuitong Carbon Management Co., Ltd., additional background documents related to the project design and baseline were reviewed.

Furthermore, cross checks were made between information provided in the VCS-PD and information from sources other than those used.

To address CEC corrective action and clarification requests, the PD was revised to version 03 and resubmitted on 15/11/2017 and the validation conclusions presented in this report relate to the project as described in the VCS-PD version 03 dated 15/11/2017.

2.3 Interviews

On 09/10/2017, the validation team held the opening meeting with the representatives of project owner and performed face to face interviews with the stakeholders. The main topics of the interviews are listed as below:

Interview topics	***Organization***	***Name***
- Project background information. - Project technology, operation and maintenance. - Project approval and right of use - Project implementation status. - Project management and monitoring plan. - Stakeholder consultation process	Keyihe Forestry Bureau	Jiang Ping Lian Guiping Yao XinSong Liu Qi Liu Laibo Wang Yang Li Zhiqian
- Applicability of selected methodology. - Baseline determination. - Emission reductions calculation. - Emission reduction monitoring plan.	Beijing Shengdahuitong Carbon Management Co., Ltd.	Tao Yun Guo Yiqiu

2.4 Site Inspections

On 09/10/2017 - 10/10/2017, the validation team performed the site inspection with the project proponent of the project activity. During this site inspection interviews with the representatives of the project owner, the consultant and project stakeholders were carried out to confirm selected information and to resolve issues identified in the document review.

2.5 Resolution of Findings

During the validation of the project activity, CEC identifies issues that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the

VCS requirements and can achieve credible emission reductions, CEC shall ensure that these issues are correctly identified, discussed and concluded in the validation report.

Corrective Action Requests (CARs) are issued, where:

The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

The applicable VCS requirements have not been met;

There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

Forward action request (FAR) are raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the VCS requirements for registration.

2.5.1 Forward Action Requests

No forward action requests was raised during the validation.

3 VALIDATION FINDINGS

3.1 Project Details

The project is located in Oroqen Autonomous Banner, Hulun Buir City, Inner Mongollia Autonomous Region, P.R.C.. The project is implemented by Inner Mongolia Keyihe Forest Industry LLC. and Beijing Shengdahuitong Carbon Management Co., Ltd.. The forest ownership and legal right of the project belongs to Inner Mongolia Keyihe Forest Industry LLC, which commissioned Beijing Shengdahuitong Carbon Management Co., Ltd. to apply the emission reductions from their IFM project activity using VCS standard. By reviewing the VCS development consultation and service agreement signed between Inner Mongolia Keyihe Forest Industry LLC and Beijing Shengdahuitong Carbon Management Co., Ltd. on 20/12/2012, CEC confirmed the roles of these two entities involved in the project activity. The project will converse 20,526 ha forest from logged to be protected.

According to the timber harvest plan approved by local forest authority, prior to the project implementation, all timber logging was planned annually. The harvested trees will be transported to the local lumber market. From 01/01/2013, the project implementation, the commercial harvest has been cancelled and only tending and managing is allowed. The project is expected to generate 3,008,381 tCO_2e emission reductions within the crediting of 30 years starting from 01/01/2013 with the average annual emission reductions of 100,279 t CO_2e, *without buffer deduction, the annual and the total emission reductions are 128,563 and 3,856,915 tCO_2e respectively.*The project activity will significantly improve the forest management conditions within the project area, and benefit local ecological environment. The implementation of the project will

not only achieve a reliable measurable carbon sequestration by reducing commercial timer, but also contribute to sustainable development of the local community. The project activity is in line with the applicable laws, statutes, and other regulatory frameworks.

The existing forest was mainly comprised of Brich and Larch, all the tree species are native to the project area. The project will converse 20,526 ha forest from logged to protected, of which Brich covers an area of 10,454 ha, Larch covers 10,072 ha. Based on its tree species, two strata has been set out as follows.

Serial number of strata	Tree species	Area (ha)	Source
1	Birch	10,454	Forest second class investigation issued by Inner Mongolia autonomous region forestry survey and design institute
2	Larch	10,072	
Total		**20,526**	

The project activity includes the Improved Forest Management (IFM) of the forests in 1,969 subcompartments spreading over Kuya department, Molengge department, Suotuhan department, Tele department, Tuohe department of Inner Mongolia Keyihe Forest Industry LLC.. All the subcompartments had the legal right to harvest issued by local forest bureau before the implementation of the project activity. Before 2013, they were all forests farms which the trees could be logged and sold once reached the cutting rotation age based on a timber harvest plan. After 2013, they are all converted to protected forests.

The project start date is 01/01/2013, which is indicated in the notice on the forbidding commercial logging was issued by Keyihe Forestry Bureau on 18/12/2012. It is indicated in this notice issued by local forest authority that from 01/01/2013 the commercial timber harvest was strictly forbidden in the project area. The project crediting period is from 01/01/2013 to 31/12/2042 with the total length of 30 years, indicated in the VCS development consultation and service agreement. Accordingly, the project starting date and crediting period is reasonable.

CL01 was raised requesting the PP to provide the evidence of the project starting date. The notice issued by the local forest authority to forbid commercial logging, was provided to prove the starting date of the project is 01/01/2013. CEC checked the notice on the forbidding commercial logging issued by Keyihe Forestry Bureau on 18/12/2012. It is indicated in this notice that from 01/01/2013 the commercial timber harvest was strictly forbidden in the project area. Hence, CL01 was closed.

The Project has not created any other forms of environmental credits. Currently in China, the other environmental credit that could have been created is Certified Emission Reductions (CER) under the CDM process and CCER under China Certified Emission Reduction process. By checking the database of CDM and CCER projects and regulation of CDM and CCER in China, CEC confirmed that the Project has not been involved in any CDM or CCER program.

The project uses approved Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.3, which belongs to the type of Improved Forest Management, scope14 "Agriculture, Forestry, Land Use". And the Project lists the monitoring parameters and sets a management plan for the leakage in the operation of the crediting period.

3.2 Application of Methodology

3.2.1 Title and Reference

The project uses approved VCS Methodology VM0010 i.e. Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.3.

Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" (version 3.0)

Tool for Calculation of the Number of Sample Plots for Measurements within A/R CDM Project Activities (Version 02.1).

Tool for "AFOLU Non-Permanence Risk Analysis" (Version 3)

3.2.2 Applicability

The Project falls within the AFOLU project category "IFM Logged to Protected Forest" as defined in the most recent version of the VCS AFOLU Guidance document, VM0010 Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.3, VCS Standard version 3.7 and the related tools. Specific conditions under which this methodology is applicable are satisfied as below:

Table 1: Applicability conditions analysis

Applicability Conditions	*Conclusions*	Jurisdiction (Y/N)
Forest management in the baseline scenario must be planned timber harvest;	The forest management in the baseline scenario can be validated as planned timber harvest according to the timber harvest plan issued by the local forest authority. CEC checked the timber harvest and plan of the project，and confirmed the annually extracted area and volume were regulated in the timber harvest plan.	Y
Under the project scenario,	Under the project scenario, the	Y

forest use is limited to activities that do not result in commercial timber harvest or forest degradation;	commercial logging has been cancelled and only tending and managing is allowed in the timber harvest plan, which clearly indicate that it will not result in commercial timber harvest or forest degradation; CEC validated the timber harvest plan， and confirmed that from 2013, commercial logging has been cancelled and only tending and managing is allowed in the project area.	
Planned timber harvest must be estimated using forest inventory methods that determine allowable offtake as volume of timber ($m^3 \cdot ha^{-1}$);	Planned timber harvest is indicated in the timber harvest plan of the project issued by the forest authority. The allowable offtake as volume of timber was part of the forest growth, which is determined by the forest inventory investigation methods.	Y
The boundaries of the forest land must be clearly defined and documented;	The boundaries of the forest land can be identified by the forest map and the forest second class investigation data by Inner Mongolia autonomous region forestry survey and design institute. Also CEC reviewed the forest right certificate, therefore the boundaries of the forest land was clearly defined and documented.	Y
Baseline condition cannot include conversion to managed plantations;	According to the timber harvest plan of the project, CEC confirmed the annually extracted area and volume were regulated, the baseline plantations are timber forest, not including the conversion to	Y

	managed plantations.	
Baseline scenario, project scenario and project case cannot include wetland or peatland.	According to the forest second class investigation, the project area is composed of forest land, therefore neither wetland nor peatland is involved in baseline scenario, project scenario and project case.	Y
All applicability conditions of VCS and CDM tools used in conjunction with this methodology must be met.	The project meets all applicability conditions of VCS and CDM tools used in conjunction with this methodology.	Y

3.2.3 Project Boundary

According to VM0010 version 1.3, the spatial boundaries of the project activity so as to facilitate accurate measuring, monitoring, accounting, and verifying of the project's emissions reductions and removals is defined below:

Step 1: Geographical Boundaries

The Project is implemented in in Oroqen Autonomous Banner, Hulun Buir City, Inner Mongollia Autonomous Region, including 1,969 subcompartments spreading over Kuya department, Molengge department, Suotuhan department, Tele department, Tuohe department of Inner Mongolia Keyihe Forest Industry LLC..

Detailed information to describe physical project boundaries per discrete area including:

- name of the project area (including compartment number, allotment number, local name);
- unique identifier for each discrete land parcel used in the timber harvest plan
- map(s) of the area (hard paper)
- geographic coordinates of each polygon vertex
- total land area; and
- details of forest land rights holder and user rights.

All the land parcels of the project are listed as follow:

Parcel number	**Department**	**Serial number**	**Area（ha）**

1	Kuya department	KY	1999
2	Molengge department	MLG	768
3	Suotuhan department	STH	6150
4	Tele department	TL	2506
5	Tuohe department	TH	9103
Total			**20526**

Of its 20,526 ha forest land, Brich covers 10,454 ha, Larch covers 10,072ha..

Of all the land parcels, Kuya department, Molengge department, Suotuhan department, Tele department, Tuohe department covers 148, 106, 681, 245, and 789 subcompartments respectively, their location and central geological coordinates are determined in the forest inventory table. CEC checked the forest second class investigation data by Inner Mongolia autonomous region forestry survey and design institute, and confirmed that the information listed in the PD and the ER calculation of the Project are consistent with the forest second class investigation, and the geographic boundaries of the Project are fixed and thus do not change over the project lifetime.

Following the VCS definition of market leakage the geographic boundaries for leakage from market effects are those of the country in which the project area occurs.

Step 2: Temporal Boundaries

The following temporal boundaries are defined:

Step 2.1: Start date and length of the project crediting period

According to VCS Standard version 3.7, the start date of the project activity is 01/01/2013, which is indicated in the notice on the forbidding commercial logging was issued by Keyihe Forestry Bureau on 18/12/2012. It is indicated in this notice issued by local forest authority that from 01/01/2013 the commercial timber harvest was strictly forbidden within the project boundary. The project crediting period is from 01/01/2013 to 31/12/2042 with the total length of 30 years, indicated in the VCS development consultation and service agreement.

Step 2.2: Duration of the monitoring periods

The project proponent decides the periodicity of verifications every 5 years.

Step 3: Carbon pools

The carbon pools included or excluded from the project boundary are shown in Table 2:

Table 2: Carbon pools

Carbon pools	Included/Optional/Excluded	Justification/Explanation of choice
Aboveground trees	Included	The stock change in the aboveground tree biomass is estimated.
Aboveground non-tree	Excluded	Exclusion is always conservative when forests remains as forest.
Belowground	Excluded	Unlikely to change significantly in forests remaining as forests and is difficult to measure - omission is conservative
Dead wood (logging slash)	Included in the baseline	The dead wood (logging slash) carbon pool is expected to be larger in the baseline than in the project scenario, and therefore this pool must be included.
Dead wood (naturally accumulated)	Excluded	Following IPCC guidelines, it is assumed that carbon stocks in the naturally occurring dead wood pool (both standing and lying) are equivalent in both the project and baseline scenario, and therefore this pool is conservatively excluded.
Harvested wood products	Included	Will be greater in baseline than project scenario and significant.
Litter	Excluded	Insignificant and exclusion is conservative.
Soil organic carbon	Excluded	Exclusion is always conservative when forests remains as forest.

Step 4: Greenhouse Gases

The emissions sources included in or excluded from the project boundary are shown in Table 3:

Table 3: Emission sources other than resulting from changes in stocks in carbon pools

Gas	Sources	Included?	Justification/Explanation

Gas	Sources	Included?	Justification/Explanation
Carbon dioxide (CO_2)	Combustion of fossil fuels (in vehicles machinery and equipment)	Excluded	Conservative as emissions will be greater in the baseline scenario than in the project case.
	Removal of herbaceous vegetation	Excluded	Based on CDM EB decision reflected in paragraph 11 of the report of the 23rd session of the board: cdm.unfccc.int/Panels/ar/023/ar_023_rep.pdf.
Methane (CH_4)	Combustion of fossil fuels (in vehicles machinery and equipment)	Excluded	Conservative as emissions will be greater in the baseline scenario than in the project case.
	Burning of Biomass	Included	Included as CO_2 equivalent emission.
Nitrous oxide (N_2O)	Combustion of fossil fuels (in vehicles machinery and equipment)	Excluded	Potential emissions are negligible
	Nitrogen based fertilizer	Excluded	Potential emissions are negligible. Following the VCS update to the Tool for AFOLU Methodological Issues and Guidance for AFOLU Projects emissions through the use of fertilizer are considered insignificant and are not considered here.
	Burning of Biomass	Excluded	Potential emissions are negligible

3.2.4 Baseline Scenario

According to the applied methodology, the baseline scenario is identified using the "Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" version 3.0. as below.

Step 1. Identification of alternative land use scenarios to the AFOLU project activity;

Sub-step 1a: Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity

a) Identify realistic and credible land-use scenarios that would have occurred on the land within the proposed project boundary in the absence of the AFOLU project activity under the VCS. The scenarios should be feasible for the project area taking into account relevant national and/or sectoral policies and circumstances, such as historical land uses, practices and economic trends. The identified land use scenarios shall at least include:

i). Continuation of the pre-project land use as the timber harvest and management plan;

ii). Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.

iii). If applicable, activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project at a rate resulting from:

- Legal requirements; or

- Extrapolation of observed similar activities in the geographical area with similar socioeconomic and ecological conditions to the proposed VCS AFOLU project activity occurring in the period beginning ten years prior to the project start date.

b) All identified land use scenarios must be credible. All land-uses within the boundary of the proposed VCS AFOLU project that are currently existing or that existed at some time in the period beginning ten years prior to the project start date but no longer exist, may be deemed realistic and credible. For all other land use scenarios, credibility shall be justified. The justification shall include elements of spatial planning information (if applicable) or legal requirements and may include assessment of economic feasibility of the proposed land use scenario.

For (iii), through on-site interview, the validation team confirm that the lands within the project boundary of the proposed VCS AFOLU project are all with the same legal requirements and are existed as timber forests more than ten years prior to the project start date. So (iii) is not applicable.

Pre-project land use scenario is the timber forest which is the common practice in China, it is feasible for the project area taking into account Forest Law of People's Republic of China. The (i) and (ii) identified land-use scenarios that would have occurred on the land within the proposed project boundary are realistic and credible, as all land-uses within the boundary of the project activity that existed in the period beginning ten years prior to the project start date but no longer exist. Therefore, the two identified realistic and credible alternative land used scenarios that could have occurred on the land within the project boundary of the VCS AFOLU project are listed above, and deemed realistic and credible.

Sub-step 1b: Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations.

The (i) and (ii) identified land-use scenarios are consistent with enforced mandatory applicable laws and regulations of China.

Hence, the identified land use scenarios include the two scenarios below:

i). Continuation of the pre-project land use;

ii). Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.

A historical practices of the local region as baseline agent of timber harvest was modeled to be the baseline scenario, which includes the documents provided by project proponent as below:

1. Historical records of forest management exist for 5 years preceding the project start date;

2. Historical records indicate that the management practices have surpassed the legal requirements provided by conforming to all local and regional forest legislation;

3. Historical records that indicate that the historical management surpasses financial barriers by providing above average financial returns.

A timber harvest plan including a detailed timber harvesting schedule based on the historical common practice and the academic research are provided. CEC checked the timber harvest plan of the project and cross-checked with local forestry bureau, and confirm the timber harvest plan is reasonable and consistent with the applicable laws and regulations.

CL02 was raised requesting the PP to describe the timber harvest plan according to the applied methodology Box 1. The timber harvest plan is supplemented in the revised PD according to the applied methodology and timber harvest plan of the project. CEC reviewed the revised PD and the timber harvest plan of the project, and consistent with the applied methodology. Hence, CL02 was closed.

<table>
<tr><td>Timber harvest plan</td><td>The project activity</td></tr>
<tr><td>reference the forest volume inventory (see Section 8.1.1 – parameter $V_{j,i|BSL}$) to identify the relative number of trees per hectare potentially available for harvest by species in each stratum;</td><td>According to the forest volume inventory, the $V_{j,i|BSL}$ is listed as follows:
<table>
<tr><td>Dominent Species</td><td>Area （ha）</td><td>Volume (m^3)</td><td>$V_{j,I,BSL}$(m^3/ha)</td></tr>
<tr><td>Brich</td><td>10,454</td><td>1197352</td><td>114.54</td></tr>
<tr><td>Larch</td><td>10,072</td><td>1191142</td><td>118.26</td></tr>
</table></td></tr>
<tr><td>demarcate all non-harvest areas within the forest based on legally required exclusions for environmental features such as slope, swamp areas or conservation buffers;</td><td>The project area contains only the commercial forest, others with environmental or ecological requirements are excluded from the project boundary, therefore, the legally required exclusions for environmental features such as slope, swamp areas or conservation buffer are obviously non-harvest areas, which is also clearly demarcated in the timber harvest</td></tr>
</table>

	plan.
divide the harvestable forest into annual operating areas (referred to throughout this methodology as land parcels) using common practice;	Yes, the harvestable forest is listed into annual operating areas. The timber harvest schedule is listed yearly by such harvest type as final felling and tending harvest.
include a design and presentation of the forestry infrastructure to harvest, skid/haul, store and move harvested timber products from the land parcels to downstream processing or market entry points. Where the project proponent accounts for emissions from forestry infrastructure, the design and presentation must include all forest roads, skidtrails and log landings that would be established under the baseline scenario as a georeferenced layer (shapefile or equivalent), and must list necessary harvest and transport machinery.	Because the emission from forestry infrastructure is hard to calculate, and if it is accounted in the baseline scenario, the total emission reduction will be greater. Considering the cost effectiveness and conservative, the project proponent didn't account for emission from forestry infrastructure.
the timber harvest plan must follow local best practice for timber harvest practices, including planning of roads, skidtrails and log landings-and the timber resource volume and extraction quotas defined in any legal requirements.	The timber harvest plan has followed local best practice for timber harvest practices. The planning of roads, skidtrails and log landings meet the related national regulations and standard. The timber resource volume and extraction quota is defined according to forest second investigation data., which comply with the legal requirements.

The timber harvest schedule	The project activity
the species to be harvested;	The species within the project area are Birch and Larch.
the year (1,2,3...) in which timber harvest of each land parcel is scheduled to occur;	The timber harvest plan is specifically stated the land parcel every year. The forestry infrastructures of departments were established when the company was founded, so the timber harvest schedule doesn't include this part.
the number of years each land parcel is in a post-harvest state during the project crediting period;	According to the timber harvest plan, the land parcel will be regenerated after timber harvest occurred, the post-harvest state during the project crediting period will be not more than a year.

the maximum and minimum diameters at breast height (DBH), at stump and at top for tree harvesting;	The code of timber harvest practice has no specific requirement for the maximum and minimum diameters at breast height (DBH), at stump and at top for tree harvesting, which is not applicable in China.
the planned harvesting regime (clear felling, specie/stratum-selective logging, area- selective logging);	The planned harvesting regime is clear felling for the project.
the fraction of merchantable timber volume from clearing of forest roads, skidtrails and log landings that is to be processed into wood products ($F_{V,INF,HWP}$). Based on this fraction, as well as forest inventory and forestry infrastructure data, $V_{EX,INF,j,i\|BSL}$ and $V_{notEX,INF,j,i\|BSL}$ (see points 2 and 3 below) will be calculated.	The fraction of merchantable timber volume from clearing of forest roads, skidtrails and log landings that is to be processed into wood products is very small and hard to calculate precisely, so we didn't take the $V_{EX,INF,j,i\|BSL}$ and $V_{notEX,INF,j,i\|BSL}$ into account for calculate the baseline scenario emission. As this is conservative for emission reduction of the project, so it is reasonable.
technical specifications for the categories of wood products to be harvested; and	There is no technical specification for the categories of the wood products, they will be determined by the requirements of the customers.
the total volumes or fractions to be harvested, broken down by categories of wood products defined as sawnwood, wood-based panels, other industrial roundwood, paper and paper board, and other.	The wood products of the project is only sawn wood, no others such as wood-based panels, other industrial roundwood, paper and paper board, etc.

CEC checked the timber harvest plan of the project and cross-checked with local forestry bureau, and CEC confirmed that the timber harvest plan is reasonable and is in compliance with the methodology.

In compliance with the methodology, if the proposed project area contains different forest types or forests with different carbon density, stratification must be carried out in order to improve the accuracy and precision of carbon stock estimates.

For estimation of base year carbon stocks, strata must be defined on the basis of parameters that are key variables in any method used to estimate changes in managed forest carbon stocks. Strata will include either forest type, vegetation type and/or target timber species.

Based on the availability of data regarding the nature and composition of forest stocks in the project area, stratification will be developed on the basis of either:

a) existing vegetation mapping or stratification, where these are documented in the legal right to harvest; or

b) estimates developed from sampling the project area using standard forest assessment protocols specific to the forest region where the project area is located.

The validation team checked the "technology of sampling investigation" published by Chinese Forest Press in 2007, in which the purposes and general methods of strata was introduced. The main purpose of strata is to improve accuracy due to the variation of carbon stock and to reduce the sampling cost. The strata is set out mainly based on the tree species, age and canopy density, but it does not means all these factors should be considered for all the project, more strata could improve the accuracy but also could result in more workload and cost accordingly. Only one single factor for strata determination is also permitted as far as it could decrease the variation within the same stratum and reach the accuracy level under certain degree of freedom. As for the project, the species, which is the most important factor for the carbon stock, is relative simple, then only two strata is set out, and the sampling accuracy has been reached 90% as required, therefore, the strata is reasonable and feasible. The strata of the Project in baseline are identified according to species as below:

Serial number of strata	Tree species	Area (ha)	Source
1	Birch	10,454	Forest second class investigation issued by Inner Mongolia autonomous region forestry survey and design institute
2	Larch	10,072	
Total		**20,526**	

3.2.5 Additionality

According to the applied methodology, the additionality is demonstrated using the "Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" version 3.0. as below:

3.2.5.1 Step1：Identification of alternative land use scenarios to the AFOLU project activity;

As mention above in section 3.2.4, the identified land use scenarios include the two scenarios below:

i). Continuation of the pre-project land use;

ii). Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.

3.2.5.2 Step 2：Investment analysis to determine that the proposed project activity is not the most economically or financially attractive of the identified land use scenarios; or

Determine whether the proposed project activity, without the revenue from the sale of GHG credits is economically or financially less attractive than at least one of the other land use scenarios.

3.2.5.2.1 Determine appropriate analysis method

According to the VT0001 VCS AFOLU Additionality Tool v3.0, there are three options can be applied for investment analysis, namely simple cost analysis (Option I), investment comparison analysis (Option II) and benchmark analysis (Option III).

According to the tool, Option I is not applicable for the proposed project since the project will generate other financial and economic benefits (e.g. small amount of sales revenue from wood products of tending and managing) other than VCS related income.

The benchmark analysis is not applicable for the proposed project since there is neither practical nor public available standard benchmark for forest protection project within the project area.

Therefore, the investment comparison analysis (Option II) will be applied for the demonstration of financial barrier for the proposed project.

3.2.5.2.2 Apply investment comparison analysis As the PP compared to determine which one is the more economic attractive scenario in the 2 scenarios identified in section 3.2.5.1.1, NPV will be used as the financial indicator for decision-making context.

3.2.5.2.3 Calculation and comparison of financial indicators (only applicable to options II and III):

1) Calculate the suitable financial indicator for the proposed VCS AFOLU project without the financial benefits from the VCS for the two alternatives identified in section3.2.5.1.1

The validation team checked the Statement on financial indicators of Keyihe forest bureau, which was issued by Keyihe forest bureau, and confirmed that the input values used for investment analysis is correctly and appropriately quoted. The assumptions and input data for the investment analysis are shown in below:

Table 6: Input values of the investment analysis

Series	Item	Unit	Baseline	Project	Data source
			value	value	
Revenue					

1	Birch Price	RMB/m^3	900	0	Statement on financial indicators of Keyihe forest bureau
2	Larch Price	RMB/m^3	750	0	
3	Other timber product from tending and managing instead of commercial harvest	RMB/m^3	313	313	
Extracted Volume					
1	Birch	m^3	1197352	0	Timber Harvest Plan
2	Larch	m^3	1191142	0	
3	Other timber product from tending and managing instead of commercial harvest	m^3/year	8000	8000	
4	Total Area	Mu	307890	307890	
Cost					
1	A/R cost	RMB/Mu	300	0	Statement on financial indicators of Keyihe forest bureau
2	Harvest cost	RMB/m^3	180	0	
3	Management Fee	RMB/Mu	120	120	
4	Additional maintenance cost for protected forest	RMB/Mu/working day	0	0.1	

2) Present the investment analysis in a transparent manner and provide all the relevant assumptions in the VCS AFOLU project description.

Table 7: Comparison of NPV at different scenarios

Scenario	***NPV (10^4 CNY)***
Baseline Scenario	17,333
Project Activity	-7,721

3.2.5.2.4 Sensitivity analysis

For the project, the key parameters are identified as: Timber price, O&M cost, extracted volume are taken into account of the sensitivity analysis. The analysis of the three key parameters is listed below:

(1) Timber price

If the timber price is increased by888.80%, the NPV of the project scenario reaches to the NPV of the baseline scenario CNY 17,333×10^4. However, in actual situation the timber price in project

scenario and baseline scenario are the same. So it is impossible for the timber price to increase by 888.80%.

(2) O&M cost

If the annual O&M cost of the project is decreased by 100%, the NPV of the project scenario can not reach to the NPV of the baseline scenario CNY $17,333\times10^4$. However, when the O&M cost is decreased by 100%, it will be zero, which will not happen in actual situation. On the other hand, the cost of labor index has increased recently according to the data of National Bureau of Statistics of China.Thus, it is impossible for the O&M cost decreasing by 100%.

(3) Extracted volume

If the extracted volume for tending and managing under the project scenario is increased by 888.80%, the NPV of the project scenario reaches to the NPV of the baseline scenario CNY $17,333\times10^4$. However, in actual situation the commercial logging is prohibited, the project receives only little revenue from timber product of tending and managing. The extracted volume of the project is determined in the timber production plan issued by the forestry authority yearly, Thus, it is impossible for the extracted volume increasing by 888.80%.

In the baseline scenario, the project receives revenue from both the commercial harvest and timber products derived from tending and managing. The latter covers a small fraction, with of the total revenue. Under the project scenario, all the commercial harvest has been cancelled and only tending and managing is allowed, the only revenue of the project scenario is the income from the selling of the timber products from tending and managing, which remains the same amounts as the baseline scenario. It is obvious that the revenue of the project is a small part of the baseline scenario, which would not be influenced by the variation of the timber price and extracted volume. While on the other hand, the cost in the project scenario will increase due to the more cost on tending and maintenance. Therefore, theoretically, it is impossible for the NPV of the project scenario to reach to the baseline scenario.

In summary, the NPV of the project can't reach to the baseline scenario even when the three main parameters vary within the sensitivity range of ±10%. Also, it confirms that, the NPV of project scenario can't reach to that of the baseline no matter how these three parameters vary.

CL03 was raised that requesting PP to provide the data source of the basic parameters used in financial analysis and sensitivity analysis should be conducted. The data source of parameters used in financial analysis is clearly stated in the PD. The NPV calculation sheet including sensitivity analysis was also provided to DOE. CEC checked the NPV calculation sheet against with the evidences provided, found the key parameters are soured from the Statement on financial indicators of Keyihe forest bureau issued by Keyihe Forestry Bureau on 18/04/2017. Hence, CL03 was closed.

Step 3.2.5.2.3 Common practice analysis

As stated in the additionality tool, Provide an analysis to which extent similar activities improving forest management to the one proposed as the IFM project activity have been implemented previously or are currently (i.e. at the time the project participants involved considered the incentives from carbon finance) underway. Similar activities are defined as those which are of similar scale, take place in a comparable environment, inter alia, with respect to the regulatory framework and are undertaken in the relevant geographical area, subject to further guidance by the underlying methodology. Other registered IFM project activities shall not be included in this analysis. Provide documented evidence and, where relevant, quantitative information. Limit your considerations to the 10-year period prior to the Project Start Date.

China covers a vast area and the economic development level of each province is much different, such as investment climate, the project sites conditions differ province by province. The project is located in Inner Mongolia Autonomous Region, thus Inner Mongolia Autonomous Region is chosen as the applicable geographical area and considered as reasonable and appropriate by validation team. By searching the VCS websites, CEC confirmed that in Inner Mongolia Autonomous Region, the Inner Mongolia Chao'er Improved Forest Management Project has been registered and the Inner Mongolia Wu'erqihan IFM (conversion of logged to protected forest)Project is under validation as VCS projects, which should not be included in this analysis.

In conclusion, no other similar activities can be observed, the proposed IFM project is not the baseline scenario, hence, it is additional.

3.2.6 Quantification of GHG Emission Reductions and Removals

3.2.6.1 Baseline Emissions

According to the methodology, the following should be considered in the baseline emission:

Included in modelling
1. Emission from wood product conversion
2. Decomposition of deadwood from harvested trees
3. Emissions from wood product retirement
4. Stock change due to regrowth following timber harvest
5. Decomposition of trees incidentally killed during tree felling
Where project proponent accounts for forest infrastructure：
6. Decomposition of trees killed through skid trail creation
7. Decomposition of trees killed through road construction
Optional (as omission is conservative)
8. Emissions from fossil fuels burned in baseline harvesting practices
Conservatively excluded from modeling
9. Emissions through subsequent forest re-entry

The options of 5 to 9 are hard to calculate and tiny in baseline scenario, and it is conservative to exclude the emission from the options of 5 to 9. Therefore, CEC confirmed that it is reasonable and conservative to exclude those from baseline emissions modelling considered of cost. The baseline net greenhouse gas emissions are determined from calculation of deadwood generated in the process of timber harvest, the emissions resulting from production and subsequent retirement of wood products derived from the timber harvesting, minus the rates of forest regrowth post timber harvest.

3.2.6.1.1 Calculation of carbon stocks in commercial timber volumes

This section calculates $C_{HB,j,i|BSL}$, the mean carbon stock in total harvested biomass in $tC \cdot ha^{-1}$ and $C_{EX,j,i|BSL}$, the mean carbon stock in extracted timber (merchantable timber that leaves the forest) in $tC \cdot ha^{-1}$.

In compliance with the methodology, the pre-existing forest second class investigation data are used as the data:

a) represents the project strata;

b) is not more than 10 years old.

The forest second class investigation data is investigated by Inner Mongolia autonomous region forestry survey and design institute (Certificate number: Jia A05-001， valid from 01/07/2013 to 30/06/2018) following related laws and regulations (e.g. State Technical Regulation for Forestry Investigation). The investigation is mainly carried out through following steps:

- Regional division and stratification through GPS and Aerophotography;
- Investigate forestry inventory for typical forest by Angle Gauge Measurement;
- Investigate forestry inventory for non-typical forest by Systematic Sampling;
- Data comprehensive analysis and system management.

The QA/QC procedure for the above mentioned steps is in line with state laws and regulations, for each investigated strata, at least 1 sample plot will be selected in 1 sub-compartment, the mean volume is calculated from a sample plot with 0.04 ha. The relevant accuracy would satisfy the essential requirement stipulated by the Tool for Calculation of the Number of Sample Plots for Measurements within A/R CDM Project Activities.

CEC validated the forest second class investigation data within the project area and the certificate of the Inner Mongolia autonomous region forestry survey and design institute, and confirmed the data used in the baseline emission calculation is from the forest second class investigation data, and the data is reasonable and appropriate, compliance with the methodology.

The estimate of merchantable volume for each species j at the sample plot level will be calculated as:

$$V_{j,\,i,\,sp} = \sum_{l}^{L} V_{l,\,j,\,i,\,sp} \qquad (1)$$

Where:

$V_{j,l,sp}$	merchantable volume for species j in stratum i in sample plot sp, m^3;
$V_{l,j,l,sp}$	merchantable volume for tree l of species j in stratum i in sample plot sp, m^3;
l	1, 2, 3 …L sequence of individual trees in sample plot;
i	1, 2, 3 …M strata;
sp	1, 2, 3 …SP sample plots; and
j	1, 2, 3 …J tree species.

Therefore, the merchantable volume per unit area of species j in stratum i will be calculated as the mean merchantable volume in all sample plots in stratum i:

$$V_{j,\,i,\,BSL} = \frac{1}{SP} * \sum_{sp=1}^{SP} \frac{V_{j,\,i,\,sp}}{A_{sp}} \qquad (2)$$

Where:

$V_{j,i,BSL}$	mean merchantable volume per unit area of species j in stratum i in the baseline scenario, m3·ha-1;
$V_{j,i,sp}$	merchantable volume for species j in stratum i in sample plot sp; m3;
A_{sp}	area of sample plot sp, ha;
i	1, 2, 3 …M strata;

sp	1, 2, 3 …SP sample plots; and
j	1, 2, 3 …J tree species.

Therefore, the carbon stock of timber harvested per unit area for species j in stratum i will be calculated from this mean volume of extracted timber:

$$C_{HB,\,j,\,i,\,BSL} = V_{EX,\,j,\,i,\,BSL} * BCEF_R * CF_j \quad (3)$$

Where:

$C_{HB,j,i,BSL}$	mean carbon stock of harvested biomass per unit area for species j in stratum i, tC·ha-1;
$V_{EX,j,i,BSL}$	mean volume of extracted timber per unit area for species j in stratum i, m3·ha-1;
$BCEF_R$	biomass conversion and expansion factor applicable to wood removals in the project area, t.d.m m-3;
CF_j	biomass conversion and expansion factor applicable to wood removals in the project area, t.d.m m-3;
i	1, 2, 3 …M strata; and
j	1, 2, 3 …J tree species.

Not all of the harvested biomass leaves the forest because the timber harvested has two components: 1) wood removed to market (extracted timber) and, 2) wood remaining in the forest as a result of harvest.

Therefore, the mean carbon stock of extracted timber per unit area for species j in stratum i will be calculated from the mean volume of extracted timber multiplied by density and carbon fractions:

$$C_{EX,\,j,\,i,\,BSL} = V_{EX,\,j,\,i,\,BSL} * D_j * CF_j \quad (4)$$

Where:

$C_{EX,j,i,BSL}$	mean carbon stock of extracted timber per unit area for species j in stratum i; tC·ha^{-1};
$V_{EX,j,i,BSL}$	mean volume of extracted timber per unit area for species j in stratum i; in m3·ha^{-1};
D_j	basic wood density of species j; t d.m. m^{-3};
CF_j	carbon fraction of biomass for species j; tC t d.m.$^{-1}$;
i	1, 2, 3 …M strata; and
j	1, 2, 3 …J tree species.

3.2.6.1.2 Calculation of dead wood (logging slash) generated in the process of timber harvest

This section calculates $\Delta C_{DWSLASH,i,p,BSL}$, the change in carbon stock in dead wood resulting from timber harvest in stratum i in land parcel p, using $C_{EX,j,i,BSL}$ and $C_{HB,j,i,BSL}$ as calculated in above section.

The simplifying assumption is made that dead wood created during timber harvest is emitted in the year of harvest. Therefore, the change in carbon stock in the dead wood pool in stratum i in land parcel p will be calculated as the difference between the total carbon stock of the harvested biomass and the carbon stock of the extracted timber:

$$\Delta C_{DWSLASH,\,i,\,p,\,BSL} = \sum_{j=1}^{J} (C_{HB,\,j,\,i,\,BSL} - C_{EX,\,j,\,i,\,BSL}) \quad (5)$$

Where:

$\Delta C_{DWSLASH,i,p,BSL}$	change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in tC·ha^{-1};

$C_{HB,j,i,BSL}$	mean carbon stock of harvested biomass per unit area for species j in stratum i, tC·ha^{-1};
$C_{EX,j,i,BSL}$	mean carbon stock of extracted timber per unit area for species j in stratum i, tC·ha^{-1};
j	1, 2, 3 …J tree species;
i	1, 2, 3 …M strata; and
p	1, 2, 3 ...P land parcels.

3.2.6.1.3 Calculation of baseline carbon sequestered in wood products

The carbon stock of extracted timber across species is calculated as:

$$C_{EX,i,BSL} = \sum_{j=1}^{J} C_{EX,j,i,BSL} \quad (6)$$

Where:

$C_{EXi,BSL}$	change in carbon stock of extracted wood products resulting from timber harvest per unit area in stratum i in land parcel p, tC·ha^{-1};
$C_{EX,j,i,BSL}$	mean carbon stock of extracted wood per hectare, tC·ha^{-1};
j	1, 2, 3 …J tree species;
i	1, 2, 3 …M strata.

In accordance with the VCS AFOLU Requirements, the amount of carbon stored in wood products that would decay within 3 years after harvest (ie, the Wood Waste (WW) and the Short Lived Fraction (SLF)), are assumed to be emitted at the time of harvest.

Wood products that are retired between 3 and 100 years after harvest (ie, the Additional Oxidised Fraction, OF), must be accounted according to a 20 year linear decay function. This decay function is applied when the net greenhouse gas emissions/removals are calculated on an annual basis in equations 11 and 12.

All other wood product pools are considered to permanently store carbon.

Therefore, the carbon stock of extracted timber that is immediately emitted to the atmosphere at the time of harvest is calculated as:

$$C_{WPO,i,BSL} = \sum_k C_{EX,i,k,BSL} * (WW_k + SLF_k) \quad (7)$$

Where:

$C_{WPOi,BSL}$	carbon stock of extracted timber from stratum i that is assumed to be emitted immediately at the time of harvest, in $tC \cdot ha^{-1}$;
$C_{EX,i,k,BSL}$	mean carbon stock of extracted timber per unit area in stratum i, for wood product type k, $tC \cdot ha^{-1}$;
WW_k	fraction of biomass carbon from wood waste that is assumed to be emitted to the atmosphere immediately at the time of harvest for wood product k, dimensionless;
SLF_k	fraction of biomass carbon from the short lived wood product pool that is assumed to that be emitted to the atmosphere immediately at the time of harvest for wood product k, dimensionless;
i	1, 2, 3 …M strata; and
k	Wood products (sawnwood, wood base products, etc).

The amount of extracted carbon stock that is assumed to enter the wood products pool that is not immediately emitted at harvest is calculated as per equation 8 below:

$$C_{WP,i,BSL} = \sum_k C_{EX,i,k,BSL} - C_{WPO,i,BSL} \quad (8)$$

Where:

$C_{WPi,BSL}$	carbon stock of extracted timber from stratum i that is assumed to enter the wood products pool that is not immediately emitted at the time of harvest ,in $tC \cdot ha^{-1}$;
$C_{EXi,BSL}$	mean carbon stock of extracted timber per unit area in stratum i, for wood product type k, $tC \cdot ha^{-1}$;
$C_{WPOi,BSL}$	carbon stock of extracted timber from stratum i that is assumed to be emitted immediately at the time of harvest, in $tC \cdot ha^{-1}$;
SLF_k	fraction of biomass carbon from the short lived wood product pool that is assumed to that be emitted to the atmosphere immediately at the time of harvest for wood product k, dimensionless;
i	1, 2, 3 …M strata; and
k	Wood products (sawnwood, wood base products, etc).

Therefore, the carbon stock of wood products assumed to be retired between 3-100 years following harvest is calculated as:

$$C_{WP100,\,i,\,BSL} = C_{WP,\,i,\,BSL} * OF_k \quad (9)$$

Where :

$C_{WP100,i,BSL}$	Amount of carbon stored in wood products that are assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC·ha-1;
$C_{WP100,i,BSL}$	carbon stock of extracted timber from stratum i that is assumed to enter the wood products pool that is not immediately emitted at the time of harvest ,in $tC \cdot ha^{-1}$;
OF_k	fraction of biomass carbon for wood product type k that is assumed to be emitted to the atmosphere between 3 and 100 years of timber harvest, dimensionless; and

i	1, 2, 3 …M strata.

3.2.6.1.4 Change in carbon stocks due to forest regrowth after harvest

The carbon sequestration in the baseline resulting from forest regrowth after timber harvest up to year t is equal to the forest regrowth rate of each stratum.

Therefore, carbon sequestration resulting from forest regrowth after timber harvest is calculated as:

$$C_{RG,\,i,\,p,\,BSL} = \sum_i RGR_i \qquad (10)$$

Where:

$C_{RG,\,i,\,p,BSL}$	carbon sequestration resulting from forest regrowth after timber harvest in stratum i in land parcel p, tC ha^{-1} yr^{-1};
RGR_i	regrowth rate of forest post timber harvest for stratum i, $tCha^{-1}$ yr^{-1};
i	1, 2, 3 …M strata.

3.2.6.1.5 Change in carbon stocks due to forest regrowth after harvest

The net carbon stock change to be converted to emissions is equal to the carbon stock change as a result of timber harvest plus the carbon stock change resulting from conversion and retirement of wood products minus carbon sequestration from forest regrowth after harvest.

In order to generate the annual carbon stock change in the baseline scenario, the total net change in carbon stocks for parcels within is multiplied by the area of forest in the particular age class (ie, years since harvest in the baseline).

The annualized calculations vary between years 1, 2-10; 10-20; and all years since the start of the project activity, depending on which decay functions apply.

Therefore, the net change in carbon stock from wood products and logging slash across all parcels within the first year of harvest in the baseline is calculated as:

$$\Delta C_{NET,\,BSL}(1) = \sum_{i,p} A_{1,\,i,\,p} * \sum_{i=1}^{M} (C_{DWSLASH,\,i,\,p\backslash\,BSL}/10) + C_{WPO,\,i,\,p\backslash\,BSL} + (C_{WP\,100,\,i,\,p\backslash\,BSL}/20) \qquad (11)$$

Where:

$\Delta C_{NET,BSL(1)}$	net change in carbon stock across all parcels in the baseline scenario in the first year since harvest in the baseline scenario, in tC;
$\Delta C_{DWSLASH,i,p,BSL}$	change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in tC ha^{-1};
$\Delta C_{WP0,i,p,BSL}$	change in carbon stock resulting from wood product conversion and retirement from stratum i in land parcel p, that is assumed to be emitted in the first year of harvest in the baseline tC ha^{-1};
$\Delta C_{WP100,i,p,BSL}$	Amount of carbon stored in wood products that is assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC ha^{-1};
$A_{1,i,p}$	the area of stratum i in land parcel p that was harvested 1 year ago, ha;
i	1, 2, 3 …M strata; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

The net change in carbon stock from wood products and logging slash across all parcels the years 2-10 since harvest in the baseline are calculated as:

$$\Delta C_{NET,\,BSL(2-10)} = \sum_{i,p} A_{2-10,\,i,\,p} * \sum_{i=1}^{M} (C_{DWSLASH,\,i,\,p\backslash\,BSL}/10) + (C_{WP\,100,\,i,\,p\backslash\,BSL}/20) \quad (12)$$

Where:

$\Delta C_{NET,BSL(2-10)}$	net change in carbon stock across all parcels in the baseline scenario in years 2-10 since harvest in the baseline scenario, in tC;
$\Delta C_{DWSLASH,i,p,BSL}$	change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in tC ha^{-1};

$\Delta C_{WP100,i,p,BSL}$	Amount of carbon stored in wood products that is assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC ha^{-1};
$A_{2\text{-}10,p}$	the area of stratum i in land parcel p that was harvested 2 and 10 years ago, ha;
i	1, 2, 3 …M strata; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

The net change in carbon stock from wood products across all parcels the years 11-20 since harvest in the baseline are calculated as:

$$\Delta C_{NET,\,BSL(11-20)} = \sum_{i,p} A_{11-20,\,i,\,p} * \sum_{i=1}^{M} (C_{WP\,100,\,i,\,p\backslash\,BSL} / 20) \quad (13)$$

Where:

$\Delta C_{NET,BSL(11\text{-}20)}$	net change in carbon stock across all parcels in the baseline scenario in years 11-20 since the start of the project activity, in tC;
$\Delta C_{WP100,i,p,BSL}$	Amount of carbon stored in wood products that is assumed to be retired between 3-100 years after harvest from stratum i in land parcel p, tC ha^{-1};
$A_{11\text{-}20,i,p}$	the area of stratum i in land parcel p that was harvested 11 and 20 years ago, ha;
i	1, 2, 3 …M strata; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

The net change (sequestration) in carbon stock due to forest regrowth across all parcels in all years since harvest in the baseline scenario are calculated according to equation 14 below. Note that there will be no more emissions quantified from decay of logging slash or wood products.

$$\Delta C_{NET,\,BSL(1+)} = \sum_{i,p} A_t * \sum_{i=1}^{M} (-\Delta C_{RG,\,i,\,p\,\setminus\,BSL}) \quad (14)$$

Where:

$\Delta C_{NET,BSL(1+)}$	net change in carbon stock due to forest regrowth in all parcels that have been harvested in the baseline scenario, in tC;
$\Delta C_{RG,i,p,BSL}$	carbon sequestration resulting from forest regrowth after timber harvest in stratum i in land parcel p, tC ha^{-1};
At*	Cumulative area harvested until time t*, ha;
i	1, 2, 3 …M strata; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

Therefore, net change in carbon stock across all parcels harvested over each year of the project crediting period in the baseline scenario since the start of the project activity is calculated as:

$$\Delta C_{NET,\,BSL,\,t*} = \sum_{p=1}^{p} \Delta C_{NET,\,p,\,BSL(1)} + \Delta C_{NET,\,p,\,BSL(2-10)} + \Delta C_{NET,\,p,\,BSL(11-20)} + \Delta C_{NET,\,p,\,BSL(1+)} \quad (15)$$

Where:

$\Delta C_{NET,BSL,t*}$	net change in carbon stock across all parcels in the baseline scenario in the year t* since the start of the project activity, in tC;
$\Delta C_{NET,BSL(1)}$	net change in carbon stock in the baseline scenario for all parcels p that are within 1 year of harvest in the baseline scenario, in tC;
$\Delta C_{NET,BSL(2\text{-}10)}$	net change in carbon stock in the baseline scenario for all parcels p, that were harvested between 2-10 years ago in the baseline

	scenario, in tC;
$\Delta C_{NET,BSL(11-20)}$	net change in carbon stock in the baseline scenario in parcel p, that were harvested between 11-20 years ago in the baseline scenario, in tC;
$\Delta C_{NET,BSL(1+)}$	net change in carbon stock due to forest regrowth in the baseline scenario for all parcels p that have been harvested in the baseline scenario, in tC;
t*	time elapsed since the start of the project, in years; and
p	1, 2, 3 ...P land parcels harvested within the project crediting period.

The net carbon stock change in the baseline scenario must be converted to net greenhouse gas emissions and is calculated as:

$$GHG_{NET,BSL,t^*} = \Delta C_{NET,BSL,t^*} * \frac{44}{12} \quad (16)$$

Where:

GHG_{NET,BSL,t^*}	net greenhouse gas emissions in the baseline scenario in the year t* since the start of the project activity, tCO_2e;
$\Delta C_{NET,BSL}$	net change in carbon stock across all parcels in the baseline scenario in the year t* since the start of the project activity, tC; and
44/12	ratio of molecular weights of carbon dioxide and carbon, $tCO_2e\ tC^{-1}$.

3.2.6.2 Project Emissions

This step calculates $GHG_{NET|PRJ}$, the net greenhouse gas emissions in the project scenario, in tCO_2e.

Greenhouse gas emissions from Improved Forest Management (IFM) activities implemented in the project scenario must be accounted subject to application of the de minimis rule, as prescribed by the VCS AFOLU Guidance Document.

The type and extent of the activities implemented in the project scenario will be described by the project proponents as part of the documentation submitted with the VCS-PD.

In accordance with the applicability conditions the project scenario does not allow commercial timber harvest. As a result, carbon stock changes due to vegetation management and fuel removal will be negligible.

Thus net greenhouse gas emissions in the project scenario will be equal to carbon sequestration through ongoing forest growth minus any emissions resulting from forest disturbance (both illegal logging and natural disturbances).

3.2.6.2.1 Ongoing forest growth in the project scenario

This section calculates $\Delta C_{AB,t,PRJ}$ annual carbon stock change in aboveground biomass of trees in the project scenario, in tCO_2e.

1) Allometry

Select the appropriate allometric equation for forest type/group of species j (e.g. tropical humid forest or tropical dry forest) or for each species or family j (group of species) found in the inventory (hereafter referred to as species group) that converts tree dimensions from field timber inventories on sample plots to aboveground biomass of trees.

2) Measurements

Only the individual trees, species and strata which were to be harvested in the baseline scenario are to be measured. Any minimum values employed in inventories are held constant for the duration of the project.

3) Determining Sample Plot Carbon Stocks

The carbon stock in aboveground biomass for each individual tree of species group j in the sample plot located in stratum i will be estimated using the selected allometric equation applied to the tree dimensions resulting from section above.

Therefore, the sum of the carbon stock in each sample plot will be calculated as:

$$C_{AB,\,j,\,i,\,t,\,sp,\,PRJ} = \sum_{l=1}^{Lj,i,sp,t} f_j(X, Y...) * CF \qquad (17)$$

Where:

$C_{AB,j,i,t,sp,PRJ}$	carbon stock in aboveground biomass of trees of species j in plot sp in stratum i at time t in the project scenario, tC;

CF_j	carbon fraction of biomass for tree group j, tC t d.m.$^{-1}$;
$f_{j(X,Y...)}$	aboveground biomass of trees based on allometric equation for species group j based on measured tree variable(s), t. d.m. tree^{-1};
i	1, 2, 3, ⋯M strata;
j	1, 2, 3 ⋯ J tree species;
l	1, 2, 3, ⋯ Lj,i,t,sp sequence number of individual trees of species group j in stratum i at time t in sample plot sp;
t	0, 1, 2, 3, ⋯t* years elapsed since start of the project activity; and
sp	1, 2, 3 ⋯SP sample plots.

4) Determining Stratum Carbon Stocks

The total carbon stock in the aboveground biomass of all trees present in sample plot sp in stratum i at time t, must be calculated as:

$$C_{AB,\,i,\,t,\,sp,\,PRJ} = \sum_{J=1}^{J} C_{AB,\,j,\,i,\,sp,\,PRJ} \qquad (18)$$

Where:

$C_{AB,i,t,sp,PRJ}$	aboveground biomass carbon stock of all trees of stratum i at time t in sample plot sp in the project scenario, tC;
$C_{AB,j,i,t,sp,PRJ}$	carbon stock in aboveground biomass of trees of species j in stratum i at time t in plot sp in the project scenario, tC;
i	1, 2, 3, ⋯M strata;

j	1, 2, 3 ⋯ J tree species;
t	0, 1, 2, 3, ⋯t* years elapsed since start of the project activity.

5) Determining Mean Carbon Stocks

Therefore, the mean carbon stock in aboveground biomass for each stratum per unit area is calculated as:

$$C_{AB,i,t,PRJ} = \frac{1}{SP} * \sum_{sp=1}^{SP} \left(\frac{C_{AB,i,t,sp,PRJ}}{A_{sp}} \right) \quad (19)$$

Where:

$C_{AB,i,t,PRJ}$	mean aboveground biomass carbon stock of trees in stratum i at time t, tC ha-1;
$C_{AB,i,t,sp,PRJ}$	aboveground biomass carbon stock of trees in stratum i at time t in sample plot sp, tC;
A_{sp}	area of sample plot sp, ha;
sp	1, 2, 3 ⋯ SP sample plots;
i	1, 2, 3, ⋯M strata; and
t	0, 1, 2, 3, ⋯t* years elapsed since start of the project activity.

6) Determining Carbon Stock Changes

The annual carbon stock change in aboveground biomass of trees in year t is the difference in mean carbon stock in aboveground biomass between sampling events and, when expressed in tCO2e, is calculated as:

$$C_{AB,\,t,\,PRJ} = (\sum_{i=1}^{M}(Ai * \frac{C_{ABi,\,t2,\,PRJ} - C_{AB,\,i,\,t1,\,PRJ}}{T})) * \frac{44}{12} \quad (20)$$

Where:

$\Delta C_{AB,t,PRJ}$	annual carbon stock change in aboveground biomass of trees in year t, tCO_2e yr-1;
$C_{AB,i,t,PRJ}$	mean aboveground biomass carbon stock of trees in stratum i at time t, tC ha-1;
A_i	area covered by stratum i, ha;
sp	1, 2, 3 ⋯ SP sample plots;
T	number of years between monitoring time t1 and t2 (T=t2 – t1); years;
i	1, 2, 3, ⋯M strata;
t	0, 1, 2, 3, ⋯t* years elapsed since start of the project activity; and
44/12	ratio of molecular weights of carbon dioxide and carbon, tCO2e tC-1.

The carbon stock change in aboveground biomass of trees (Δ CAB,t|PRJ) is the output of this section and is necessary to calculate net greenhouse gas emissions in the project scenario.

3.2.6.2.2 Forest disturbance in the project scenario

This section calculates $\Delta C_{DIST\_FR,t,PRJ}$, carbon stock change due to fire disturbance in the project scenario; tCO_2e, $\Delta C_{DIST,t,PRJ}$, carbon stock change due to non-fire natural disturbance in the project scenario; tCO_2e

1) Natural disturbance

a) Natural Disturbance – Fire

Where fires occur ex post in the project area, the area burned shall be delineated. Therefore, based on the IPCC 2006 Inventory Guidelines, estimation of greenhouse gas emissions from biomass burning shall be calculated as:

$$\Delta C_{DIST-FR,t,PRJ} = \sum_{i=1}^{M} A_{burn,i,t} * B_{i,t,PRJ} * COMF_i * G_{g,i} * 10^{-3} . GWP_{CH4} \quad (21)$$

Where:

$\Delta C_{DIST\_FR,t,PRJ}$	net greenhouse gas emissions resulting from fire disturbance in year t, tCO_2e ;
$A_{burn,i,t}$	area burnt for stratum i at time t, ha;
$B_{i,t,PRJ}$	average aboveground biomass stock present in the project scenario but absent in the baseline scenario before burning stratum i, time t; t d. m. ha-1;
$COMF_i$	combustion factor for stratum i, dimensionless;
$G_{g,i}$	emission factor for stratum i for methane, g kg-1 dry matter burnt;
GWP_{CH4}	global warming potential for CH4 (IPCC default: 21), $tCO_2e\ tCH_4^{-1}$;
i	1, 2, 3, ⋯M strata;
t	0, 1, 2, 3, ⋯t* years elapsed since start of the project activity.

The average aboveground biomass stock present in the project scenario but absent in the baseline scenario before burning for a particular stratum shall be calculated as:

$$B_{i,t,PRJ} = \sum_{j=1}^{J} \{V_{EX,i,j,BSL} * BCEF_R\} \quad (22)$$

Where:

$B_{i,t,PRJ}$	average aboveground biomass stock present in the project scenario but absent in the baseline before burning for stratum i, time t, t d. m. ha^{-1};
$V_{EX,j,I,BSL}$	mean volume of extracted timber per unit area for species j in stratum i, m3 • ha-1;
$BCEF_R$	biomass conversion and expansion factor applicable to wood removals in the project area, t.d.m m^{-3};
GWP_{CH4}	global warming potential for CH4 (IPCC default: 21), $tCO_2e\ tCH_4^{-1}$;
i	1, 2, 3, ⋯M strata;
j	1, 2, 3 ⋯J tree species; and
t	0, 1, 2, 3, ⋯t* years elapsed since start of the IFM project activity.

b) Natural Disturbance – Non-Fire

There are no fire disturbance occurred in the project area, therefore, ΔCDIST_FR,t|PRJ=0.

Where non-fire natural disturbances occur ex post in the project area, the area disturbed must be delineated.

$$\Delta C_{DIST,t,PRJ} = \sum_{i=1}^{M}(A_{dist,i,t} * \sum_{j=1}^{J}\{C_{AB,j,i,BSL}\}) * \frac{44}{12} \quad (23)$$

Where:

$\Delta C_{DIST,t,PRJ}$	net greenhouse gas emissions resulting from non-fire natural disturbance in year t, tCO_2e ;
$A_{dist,i,t}$	area disturbed for stratum i at time t, ha;

$C_{AB,i,BSL}$	carbon stock in aboveground biomass per unit area in stratum i, tC • ha-1;
44/12	ratio of molecular weights of carbon dioxide and carbon, tCO2e tC-1;
i	1, 2, 3, ⋯M strata;
j	1, 2, 3 ⋯J tree species; and
t	0, 1, 2, 3, ⋯t* years elapsed since start of the IFM project activity.

There are non-fire natural disturbances occur ex post in the project area, therefore, $\Delta C_{DIST,t,PRJ}=0$

2) Illegal logging

Where the PRA and the limited sampling indicate degradation is occurring, net carbon stock changes as a result of illegal logging shall be calculated as:

$$\Delta C_{DIST-1L,t,PRJ} = \sum_{i=1}^{M} \left(A_{Dist-1L,j} * \frac{C_{DIST-1L,i,t,PRJ}}{AP_i} \right) \quad (24)$$

Where:

$\Delta C_{DIST\_IL,t,PRJ}$	net carbon stock changes as a result of illegal logging at time t, tCO2e;
$A_{dist,i,t}$	area disturbed for stratum i at time t, ha;
$C_{DIST\_IL,i,t,BSL}$	biomass carbon of trees cut and removed through illegal logging in stratum i at time t, tCO2e;
A_{Pi}	total area of illegal logging sample plots in stratum i, ha;
i	1, 2, 3, ⋯M strata;

t	0, 1, 2, 3, ⋯t* years elapsed since start of the IFM project activity.

3.2.6.2.3 Net greenhouse gas emissions in the project scenario

This section calculates $\Delta C_{NET,t,PRJ}$, the net greenhouse gas emissions in the project scenario in year t, in tCO2e.

The net greenhouse gas emissions in the project scenario are the sum of net greenhouse gas emissions resulting from fire and non-fire forest disturbance, plus any carbon stock changes that occur as a result of illegal logging, minus the annual carbon stock change in the aboveground biomass of trees due to forest growth.

Therefore, net greenhouse gas emissions in the project scenario in year t, is calculated as:

$$\Delta C_{NET,t,PRJ} = (\Delta C_{DIST-FR,t,PRJ} + \Delta C_{DIST,t,PRJ} + \Delta C_{DIST-1L,t,PRJ}) - \Delta C_{AB,t,PRJ} \quad (25)$$

Where,

$\Delta C_{NET,t,PRJ}$	net greenhouse gas emissions in the project scenario in year t, tCO2-e;
$\Delta C_{DIST\_FR,t,PRJ}$	net greenhouse gas emissions resulting from fire disturbance in year t, tCO2e
$\Delta C_{DIST,t,PRJ}$	net greenhouse gas emissions resulting from non-fire natural disturbance in year t, tCO2e;
$\Delta C_{DIST\_IL,t,PRJ}$	Net carbon stock changes as a result of illegal logging at time t, tCO2e;
$\Delta C_{AB,t,PRJ}$	annual carbon stock change in aboveground biomass of trees in year t, tCO2e yr-1; and
t	0, 1, 2, 3, ⋯t* years since start of the project activity.

The net greenhouse gas emissions across in the project scenario since the start of the project activity is calculated as:

$$GHG_{NET,\,PRJ} = \sum_{t=1}^{t^*} \Delta C_{NET,\,t,\,PRJ} \quad (26)$$

Where:

$GHG_{NET,PRJ}$	net greenhouse gas emissions in the project scenario since the start of the project activity, tCO2e
$\Delta C_{NET,t,PRJ}$	net greenhouse gas emissions in the project scenario in year t, tCO2e; and
t	0, 1, 2, 3, ⋯t* years since start of the project activity.

3.2.6.3 Leakage

3.2.6.3.1 Activity shifting leakage

In China, the forest timber harvest is strictly controlled by the authority. The stated council issued the annual timber harvest volume limit to each provinces every fives at the beginning of every national 5-year plan. And the provincial forestry authority issued the timber harvest approval and restrictions to its subordinate based on its limit. And its subordinate forestry authority did the same way for the timber harvest and transportation approval as its superior issued.

Also, the China Forest Law also clearly stipulates the punishment for the illegal logging, which not only requires 5-10 times compensation of replanting, but also 2-10 times economic penalty.

Definitely, in China, the timber harvest is tightly controlled by the forestry authority, the illegal logging is severely punished.

Therefore, for the project activity, even if the project proponent has more than one commercial forest parcels, the timber harvest limit is planned in advance by the forestry authority, they have no right to harvest more in other parcels outside the project activity.

Therefore, there is no leakage due to activity shifting.

3.2.6.3.2 Market leakage

Leakage due to market effects is equal to the net emissions from planned timber harvest activities in the baseline scenario multiplied by an appropriate leakage factor: $GHG_{LK,LtPF,t^*} = LF_{ME} * GHG_{NET,BSL,t^*}$ (27)

Where:

$GHG_{LK,Lt,PF}$	is total market leakage as a result of IFM LtPF activities, tCO2e;
LF_{ME}	is the dimensionless leakage factor for market-effects calculations;
$GHG_{NET\|BSL,t^*}$	net greenhouse gas emissions in the baseline scenario in the year t* since the start of the project activity, tCO2e.

According to the methodology, the leakage factor is defined as considering where in the country logging will be increased as a result of the decreased supply of the timber caused by the project. If the areas liable to be logged have a higher ratio of merchantable biomass to total biomass higher than the project area it is likely that the proportional leakage is higher and vice versa:

Therefore,

$LF_{ME} = 0$

If it can be demonstrated that no market-effects leakage will occur within national boundaries, that is if no new concessions are being assigned AND annual extracted volumes cannot be increased within existing national concessions AND illegal logging is absent (or de minimis) in the host country.

For the project,

- According to the 13th Five-year Forest Harvest Limit issued by State Council (Guohan [2016] No.32)1, the total harvest volume limit from 2016 to 2020 is 25,403.6*10^4 m^3, and the planned harvest volume of the project is 59.9*10^4 m^3, accounting 0.24% of the national harvest volume, which will not result in the significant national concession and illegal logging;
- The annual extracted volume is unlikely increase within existing national concessions AND illegal logging is strictly forbidden and will be severely punished by the law.

Therefore,

$LF_{ME} = 0$

3.2.6.4 Net GHG Emission Reductions and Removals

[1] http://www.gov.cn/zhengce/content/2016-02/16/content_5041486.htm

Knowledge of the greenhouse gas emission level calculations for baseline scenario, project scenario and leakage allows an ex-ante estimation of the level of net GHG emission reductions resulting at the end of each year over the project crediting period from the implementation of the proposed Logged to Protected Forest (LtPF)-IFM project.

Therefore, the project GHG credits are calculated as:

$$GHG_{CREDITS,\,LtPF,\,t^*} = GHG_{NET,\,BSL,\,t^*} - GHG_{NET,\,PRJ,\,t^*} - GHG_{LK,\,LtPF,\,t^*} \quad (28)$$

Where:

$GHG_{CREDITS,Lt,PF,t^*}$	project greenhouse gas credits associated with the implementation of improved forest management (IFM) activities in the year t* since the start of the project activity, in the project scenario, tCO_2e
GHG_{NET,BSL,t^*}	net greenhouse gas emissions in the baseline scenario in the year t* since the start of the project activity, tCO_2e;
GHG_{NET,PRJ,t^*}	net greenhouse gas emissions in the project scenario in the year t* since the start of the project activity, tCO2e; and
GHG_{LK,Lt,PF,t^*}	total greenhouse gas emissions due to leakage arising outside the project boundary as a result of the implementation of improved forest management (IFM) activities in the year t* since the start of the project activity, in the project scenario, tCO2e

3.2.6.5 Project Verified Carbon Units

3.2.6.5.1 Adjustment for uncertainty

Estimated greenhouse gas emissions and emission reductions from IFM activities have uncertainties associated with parameters and coefficients including estimates of area, carbon stocks, regrowth and expansion factors. It is assumed that the uncertainties associated with input data are available, either as default uncertainty values given in most recent IPCC guidelines, or as statistical estimates based on sampling.

Uncertainty at all times is defined at the 95% confidence interval where the estimated variance exceeds +/- 15 percent from the mean. Procedures including stratification and the allocation of sufficient measurement plots will help ensure that low uncertainty results and ultimately full crediting can result.

Uncertainties arising from the measurement and monitoring of carbon pools and greenhouse gases shall always be quantified. Errors in each pool shall be weighted by the size of the pool so that projects may reasonably target a lower precision level in pools that only form a small proportion of the total stock.

For both the baseline and the with-project case the total uncertainty is equal to the square root of the sum of the squares of each component uncertainty and is calculated at the time of reporting through propagating the error in the baseline stocks and the error in the project stocks.

$$U_{TOTAL,\,LtPF} = \sqrt{U^2_{PRJ} + U^2_{BSL}} \quad (29)$$

Where:

$U_{total,LtPF}$	total uncertainty for LtPF Project, dimensionless;
U_{PRJ}	total uncertainty for the improved forest management activities in the project scenario, dimensionless; and
U_{BSL}	total uncertainty for the baseline scenario, dimensionless.

Project proponents must justify the selection of uncertainty propagation in the VCS-PD. If $Utotal|LtPF \leq 0.15$ then no deduction will result for uncertainty.

If $U_{total|LtPF} > 0.15$ then the amount of greenhouse gas emission credits associated with IFM activities will be deducted as follows:

$$Credits_{total|LtPF} = GHG_{credits|LtPF} * (1 - U_{total|LtPF}) \quad (30)$$

Where:

$Credits_{total\|LtPF}$	total greenhouse gas credits adjusted for uncertainty for each year t in the project crediting period;
$GHG_{credits\|LtPF}$	project greenhouse gas credits associated with the implementation of improved forest management (IFM) activities in the project scenario, $tCO_{2e} \cdot year^{-1}$; and
$U_{total\|LtPF}$	total uncertainty for LtPF Project, dimensionless

3.2.6.5.2 Calculation of verified carbon units (ex-post)

The number of Verified Carbon Units (VCUs) for each year t in the project crediting period is the greenhouse gas emission reductions and removals adjusted for uncertainty and risk.

They shall be subject to deductions based on application of the most recent version of the VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination.

Therefore, the amount of VCU's that can be issued at time t=t2 (the date of verification) for monitoring period T=t2-t1, is calculated as:

$$VCU_{net,\,LtPF} = (\text{Credits}_{\text{total, t 2, LtPF}} - \text{Credits}_{\text{total, t 1, LtPF}}) - \text{Bu}_{\text{IFM- VCS}} \quad (31)$$

Where:

$VCU_{net,LtPF}$ number of verified carbon units; dimensionless;

$Credits_{total.t1,LtPF}$ net anthroprogenic greenhouse gas removals by sinks, as estimated for t*=t1 in tCO_{2e};

$Credits_{total.t2,LtPF}$ net anthroprogenic greenhouse gas removals by sinks, as estimated for t*=t2 in tCO_{2e}; and

$Bu_{IFM-VCS}$ total number of credits withheld in VCS buffer account.

3.2.6.6 Calculation process

3.2.6.6.1 Calculation of baseline emissions

(1) Basic parameters used in baseline calculation

The value and data source of parameters used in baseline calculation is validated as follows:

Basic Parameter		Value	Data Unit	Data Source	Note
Total Area of Stratum	Birch	10454	ha	1. Timber harvest plan issued by Inner Mongolia Keyihe Forestry Bureau 2. calculated from Forest second class investigation issued by Inner Mongolia autonomous region forestry survey and	
	Larch	10072	ha		
$V_{,j,l,BSL}$	Birch	114.54	m^3/ha		
	Larch	118.26	m^3/ha		
$V_{EX,j,i\|BSL,y}$	Refer to ER sheet		m^3/ha		
$A_{i,p,y}$	Refer to ER sheet		ha		$A_{1,i,p}$, $A_{2\text{-}10,i,p}$, $A_{11\text{-}20,i,p}$,

				design institute	$A_{t,p}$ are calculated by Ai,p,y
D_j	Birch	0.541	t d.m. m^{-3}	"Land Use Change and Forestry GHG Inventory(2013)" of "Second National Information Notification on China Climate Change"	
	Larch	0.490	t d.m. m^{-3}		
BEF	Birch	1.424	dimensionless		
	Larch	1.416	dimensionless		
$BCEF_R$	Birch	0.770	t d.m. m^{-3}	calculated by BEF and D	
	Larch	0.694	t d.m. m^{-3}		
CF_j	Birch/Larch	0.5	tC t d.m.$^{-1}$	VM0010 version 1.3	
WW	Birch/Larch	24%	kg kg^{-1}		
SLF	Birch/Larch	0.12	kg kg^{-1}		
OF	Birch/Larch	0.62	kg kg^{-1}		
Regrowth rate in baseline scenario	Birch	1.56	$m^3.ha^{-1}.yr^{-1}$	The statement on the growth volume in Keyihe issued by Inner Mongolia autonomous region forestry survey and design institute	RGRi is calculated by this parameters, BEF and D.
	Larch	1.83	$m^3.ha^{-1}.yr^{-1}$		

(2) Calculation results of baseline emission

CEC validated the calculation process of baseline emission, and confirmed the calculation is correct and reasonable. The annually baseline emission is as follows:

Year	$\Delta C_{NET\|BSL}$	$GHG_{NET\|BSL}$
Year 2013	4,225	15,491
Year 2014	3,534	12,958
Year 2015	2,541	9,317
Year 2016	6,672	24,464
Year 2017	3,020	11,073
Year 2018	18,292	67,070
Year 2019	26,051	95,520

Year 2020	25,421	93,210
Year 2021	44,544	163,328
Year 2022	17,829	65,373
Year 2023	26,468	97,049
Year 2024	28,492	104,470
Year 2025	19,667	72,112
Year 2026	21,507	78,859
Year 2027	23,331	85,547
Year 2028	25,897	94,955
Year 2029	19,416	71,192
Year 2030	20,605	75,551
Year 2031	20,621	75,610
Year 2032	17,010	62,370
Year 2033	15,715	57,621
Year 2034	10,885	39,911
Year 2035	13,703	50,244
Year 2036	13,989	51,293
Year 2037	10,346	37,935
Year 2038	7,759	28,449
Year 2039	7,312	26,810
Year 2040	6,919	25,369
Year 2041	4,019	14,736

Year 2042	1,516	5,558
Total	467,306	1,713,445
Average	15,576	57,114

3.2.6.6.2 Calculation of project emissions

(1) Basic parameters used in project calculation

The value and data source of parameters used in project calculation is validated as follows:

Basic Parameter		Value	Data Unit	Data Source
Total Area of Stratum	Birch	10454	ha	Timber harvest plan
	Larch	10072	ha	
D_j	Birch	0.541	t d.m. m^{-3}	"Land Use Change and Forestry GHG Inventory(2013)" of "Second National Information Notification on China Climate Change"
	Larch	0.490	t d.m. m^{-3}	
BEF	Birch	1.424	dimensionless	
	Larch	1.416	dimensionless	
$BCEF_R$	Birch	0.770	t d.m. m^{-3}	calculated by BEF and D
	Larch	0.694	t d.m. m^{-3}	
CF_j	Birch/Larch	0.5	tC t d.m.$^{-1}$	VM0010 version 1.3
Ongoing growth rate in project scenario	Birch	2.80	$m^3.ha^{-1}.yr^{-1}$	The statement on the growth volume in Keyihe issued by Inner Mongolia autonomous region forestry survey and design institute
	Larch	2.35	$m^3.ha^{-1}.yr^{-1}$	

Note： As for the project tree species, there are no allometric equation (fj(x,y)) applied in the project area, the average annual growth is adopted for the estimated calculation of carbon stock change. Therefore, the on-going growth rate is based on the expertise issued by the statement of local forest authority, and in the monitoring report, the actual sampling data will be adopted.

(2) Calculation results of project emission

CEC validated the calculation process of project emission, and confirmed the calculation is correct and reasonable. The annually baseline emission is as follows:

Year	$\Delta C_{AB,t\|PRJ}$	$\Delta C_{DIST\ FR,t\|PRJ}$	$\Delta C_{DIST,t\|PRJ}$	$\Delta C_{DIST\ IL,t\|PRJ}$	$\Delta C_{NET,t\|PRJ}$
Year 2013	71,449	0	0	0	-71,449
Year 2014	71,449	0	0	0	-71,449
Year 2015	71,449	0	0	0	-71,449
Year 2016	71,449	0	0	0	-71,449

Year 2017	71,449	0	0	0	-71,449
Year 2018	71,449	0	0	0	-71,449
Year 2019	71,449	0	0	0	-71,449
Year 2020	71,449	0	0	0	-71,449
Year 2021	71,449	0	0	0	-71,449
Year 2022	71,449	0	0	0	-71,449
Year 2023	71,449	0	0	0	-71,449
Year 2024	71,449	0	0	0	-71,449
Year 2025	71,449	0	0	0	-71,449
Year 2026	71,449	0	0	0	-71,449
Year 2027	71,449	0	0	0	-71,449
Year 2028	71,449	0	0	0	-71,449
Year 2029	71,449	0	0	0	-71,449
Year 2030	71,449	0	0	0	-71,449
Year 2031	71,449	0	0	0	-71,449
Year 2032	71,449	0	0	0	-71,449
Year 2033	71,449	0	0	0	-71,449
Year 2034	71,449	0	0	0	-71,449
Year 2035	71,449	0	0	0	-71,449
Year 2036	71,449	0	0	0	-71,449
Year 2037	71,449	0	0	0	-71,449
Year 2038	71,449	0	0	0	-71,449
Year 2039	71,449	0	0	0	-71,449
Year 2040	71,449	0	0	0	-71,449
Year 2041	71,449	0	0	0	-71,449
Year 2042	71,449	0	0	0	-71,449
Total	2,143,470	0	0	0	-2,143,470
Average	71,449	0	0	0	-71,449

CAR01 was raised that the ER calculation should be correct according to the applied methodology. The documented evidence should be provided on the data and parameters used in the ER calculation. PP revised the ER calculation in the PD version 03 according to the methodology. Additionally, the reasonable data source was described in the PD and also provided. CEC reviewed the data source of every parameters used in the ER calculation, and confirmed the data source is reasonable and consistent with the actual situation of the project. CEC also checked the revised PD and ER calculation sheet, and found the ER calculation process is reproducible and the results is correct. Hence, CAR01 is closed.

3.2.6.6.3 Calculation of uncertainty

According to the methodology, the uncertainty in the baseline scenario is associated with parameters and coefficients including estimates of area, carbon stocks, regrowth and expansion factors, the calculation process follows the two rules below:

Rule A: Where uncertainties are to be combined by addition, the standard deviation of the sum will be the square root of the sum of the squares of the standard deviations of the quantities that are added with the standard deviations all expressed in absolute terms (this rule is exact for uncorrelated variables).

Using this interpretation, a simple equation can be derived for the uncertainty of the sum, that when expressed in percentage terms becomes:

$$U_{total} = \frac{\sqrt{(U_1 * E_1)^2 + (U_2 * E_2)^2 + ... + (U_n * E_n)^2}}{E_1 + E_2 + ... + E_n} \quad (32)$$

Where:

U_{total} is the percentage uncertainty in the sum of the quantities (half the 95% confidence interval divided by the total (i.e. mean) and expressed as a percentage);

Ei and Ui are the uncertain quantities and the percentage uncertainties associated with them, respectively.

Rule B: Where uncertain quantities are to be combined by multiplication, the same rule applies except that the standard deviations must all be expressed as fractions of the appropriate mean values (this rule is approximate for all random variables).

A simple equation can also be derived for the uncertainty of the product, expressed in percentage terms:

$$U_{total} = \sqrt{U_1^2 + U_2^2 + ... + U_n^2} \quad (33)$$

Where:

U_{total} is the percentage uncertainty in the product of the quantities (half the 95% confidence interval divided by the total and expressed as a percentage);

Ui are the percentage uncertainties associated with each of the quantities.

The uncertainty are calculated per stratum by dividing the 95% confidence interval by the mean value of the uncertainty quantities. The corresponding standard deviation is calculated over the measured plot values of the uncertainty quantities. The 95% confidence interval is calculated based on the standard deviation and the t-value for n-1 degree of freedom of plots per stratum.

As the uncertainty in the baseline scenario is associated with parameters and coefficients including estimates of area, carbon stocks, regrowth and expansion factors, the calculation of the 4 parameters and coefficients are shown below:

1) Uncertainty of Area:

In the baseline scenario, the area of every stratum are quoted from the second class forestry investigation and forest right certificate, so no data are from measurement and monitoring. Therefore, it is deemed as 0 in the period of validation. It will be monitored in the period of verification.

2) Uncertainty of expansion factors:

The Sample size, Sample mean and Standard error of expansion factors are quoted from Forestry Part of China's greenhouse gas emissions list divided as tree species, and the details is listed in the following table.

For Birch:

Uncertainty of BCEF-Birch		5.95%	
Uncertainty of BEF-Birch	5.89%	Uncertainty of D-Birch	0.84%
BEF		D	
Sample size	55	Sample size	62
Sample mean (BEF)	1.180	Sample mean (D)	0.541
Standard deviation	0.257	Standard deviation	0.018
Average error	0.035	Average error	0.002
Confidence level	0.950	Confidence level	0.950
Degree of freedom	54	Degree of freedom	61
Two-sided Student's t-value	2.005	Two-sided Student's t-value	2.000
Allowable error	0.069	Allowable error	0.005
Lower confidence limit	1.111	Lower confidence limit	0.536
Upper confidence limit	1.249	Upper confidence limit	0.546
Confidence interval	0.069	Confidence interval	0.005

For Larch:

Uncertainty of BCEF-Larch		5.76%	
Uncertainty of BEF-Larch	3.16%	Uncertainty of D-Larch	4.81%
BEF		D	
Sample size	321	Sample size	13
Sample mean (BEF)	1.416	Sample mean (D)	0.490

Standard deviation	0.408	Standard deviation	0.039
Average error	0.023	Average error	0.011
Confidence level	0.950	Confidence level	0.950
Degree of freedom	320	Degree of freedom	12
Two-sided Student's t-value	1.967	Two-sided Student's t-value	2.179
Allowable error	0.045	Allowable error	0.024
Lower confidence limit	1.371	Lower confidence limit	0.466
Upper confidence limit	1.461	Upper confidence limit	0.514
Confidence interval	0.045	Confidence interval	0.024

3) Uncertainty of carbon stock:

The calculation of uncertainty of carbon stock is based on the uncertainty of volume in every stratum multiply by the uncertainty of expansion factors.

Uncertainty of carbon stock-Birch	6.02%	Uncertainty of carbon stock-Larch	5.95%
Uncertainty of volume-Birch	0.90%	Uncertainty of volume-Larch	1.52%
carbon stock-Birch	677734.22	carbon stock-Larch	548648.87
Area(ha)	10454.00	Area(ha)	10072.00
Sample size	830	Sample size	1139
Sample mean (m^3/ha)	168.31	Sample mean (m^3/ha)	157.02
Standard deviation	22.23	Standard deviation	40.98
Average error	0.77	Average error	1.21
Confidence level	0.95	Confidence level	0.95
Degree of freedom	829	Degree of freedom	1138
Two-sided Student's t-value	1.96	Two-sided Student's t-value	1.96
Allowable error	1.51	Allowable error	2.38
Lower confidence limit	166.79	Lower confidence limit	154.64
Upper confidence limit	169.82	Upper confidence limit	159.40
Confidence interval	1.51	Confidence interval	2.38

4) Uncertainty of regrowth

The uncertainty of regrowth is only associated with the parameter RGR_i, as for the value quoted from the expertise of the local forest authority, the uncertainty of 10% is adopted from the National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau. And this uncertainty is adopted for the project for conservative.

5) Uncertainty calculation

CEC validated the calculation process of the uncertainty of baseline emission and project emission, and confirmed the calculation is correct and reasonable. Based on the calculation of the above parameters and coefficients above, the U_{total} is 8.38%.

According to the methodology, if $U_{total,LtPF} \leqslant 0.15$ then no deduction will result for uncertainty, therefore, it is unnecessary for the project to deduct for the uncertainty.

3.2.6.6.4 Calculation of verified carbon units

The amount of greenhouse gas credits estimated above shall be adjusted to account for risk.

They shall be subject to deductions based on application of the most recent version of the VCS Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination.

Therefore, the amount of VCUs that can be issued at time t=t2 (the date of verification) for monitoring period T=t2-t1, is calculated as:

$$VCU_{net,\,LtPF} = (\text{Credits}_{\text{total, t 2, LtPF}} - \text{Credits}_{\text{total, t 1, LtPF}}) - \text{Bu}_{\text{IFM-VCS}} \quad (34)$$

Where:

$VCU_{net,LtPF}$ number of verified carbon units; dimensionless;

$Credits_{total.t1,LtPF}$ net anthroprogenic greenhouse gas removals by sinks, as estimated for $t^*=t_1$ in tCO_2e;

$Credits_{total.t2,LtPF}$ net anthroprogenic greenhouse gas removals by sinks, as estimated for $t^*=t_2$ in tCO_2e; and

$Bu_{IFM-VCS}$ total number of credits withheld in VCS buffer account.

Based on the analysis in NON-PERMANENCE RISK REPORT, the overall risk rating is 22, then

22% of the total emission reductions shall be deducted .

Therefore, the emission reduction detail is listed:

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)	Estimated net GHG emission reductions or removals with buffer deduction (tCO_2e)
01/01/2013-	15,491	-71,449	0	86,940	67,813

31/12/2013					
01/01/2014-31/12/2014	12,958	-71,449	0	84,407	65,837
01/01/2015-31/12/2015	9,317	-71,449	0	80,766	62,997
01/01/2016-31/12/2016	24,464	-71,449	0	95,913	74,812
01/01/2017-31/12/2017	11,073	-71,449	0	82,522	64,367
01/01/2018-31/12/2018	67,070	-71,449	0	138,519	108,044
01/01/2019-31/12/2019	95,520	-71,449	0	166,969	130,235
01/01/2020-31/12/2020	93,210	-71,449	0	164,659	128,434
01/01/2021-31/12/2021	163,328	-71,449	0	234,777	183,126
01/01/2022-31/12/2022	65,373	-71,449	0	136,822	106,721
01/01/2023-31/12/2023	97,049	-71,449	0	168,498	131,428
01/01/2024-31/12/2024	104,470	-71,449	0	175,919	137,216
01/01/2025-31/12/2025	72,112	-71,449	0	143,561	111,977
01/01/2026-31/12/2026	78,859	-71,449	0	150,308	117,240
01/01/2027-31/12/2027	85,547	-71,449	0	156,996	122,456
01/01/2028-31/12/2028	94,955	-71,449	0	166,404	129,795
01/01/2029-31/12/2029	71,192	-71,449	0	142,641	111,259
01/01/2030-31/12/2030	75,551	-71,449	0	147,000	114,660
01/01/2031-31/12/2031	75,610	-71,449	0	147,059	114,706
01/01/2032-31/12/2032	62,370	-71,449	0	133,819	104,378

01/01/2033-31/12/2033	57,621	-71,449	0	129,070	100,674
01/01/2034-31/12/2034	39,911	-71,449	0	111,360	86,860
01/01/2035-31/12/2035	50,244	-71,449	0	121,693	94,920
01/01/2036-31/12/2036	51,293	-71,449	0	122,742	95,738
01/01/2037-31/12/2037	37,935	-71,449	0	109,384	85,319
01/01/2038-31/12/2038	28,449	-71,449	0	99,898	77,920
01/01/2039-31/12/2039	26,810	-71,449	0	98,259	76,642
01/01/2040-31/12/2040	25,369	-71,449	0	96,818	75,518
01/01/2041-31/12/2041	14,736	-71,449	0	86,185	67,224
01/01/2042-31/12/2042	5,558	-71,449	0	77,007	60,065
Total	1,713,445	-2,143,470	0	3,856,915	3,008,381
Average	57,114	-71,449	0	128,563	100,279

CL04 was raised requesting the PP to provide transparent calculation process and related evidence for the determination of uncertainty. The PP provided the uncertainty analysis calculation spreadsheet of the project. The validation team checked the spreadsheet and confirmed that the calculation process has been conducted according to the methodology, related evidence has also been provided and validated by CEC. The result has been correctly calculated. Hence, **CL04** was closed.

3.2.7 Methodology Deviations

Not applicable.

3.2.8 Monitoring Plan

The data and parameters available in the validation are listed below, CEC validates the data source and confirmed the suitability and eligibility of these parameters:

1) $V_{l,j,i,sp}$, Merchantable volume for tree l of species j in sample plot spin stratum i

2) CF_j , Carbon fraction of dry matter for species j

3) D_j , Basic wood density of species j in t d.m. m-3

4) $f_j(X,Y…)$, Allometric equation(s) for species j linking measured tree variable(s) to aboveground biomass of living trees

5) $BCEF_R$, Biomass conversion and expansion factor applicable to wood removals in the project area

6) G_{gi} , Emission factor for stratum *i* for gas *g*

7) RGR_i , Forest re-growth rate post timber harvest for stratum i m

8) OF, Fraction of wood products that will be emitted to the atmosphere between 3 and 100 years after production

9) SLF， Fraction of wood products that will be emitted to the atmosphere within 3 years of production

10) WW, Fraction of extracted biomass effectively emitted to the atmosphere during production

11) $V_{EX,j,i|BSL}$, Mean volume of extracted timber per unit area for species j in stratum i l

12) $A_{i,p}$, Area covered by stratum i over land parcel p

13) $A_{1,i,p}$, The area of stratum i in land parcel p that was harvested 1 year ago

14) $A_{2\text{-}10,i,p}$, The area of stratum i in land parcel p that was harvested between 2 and 10 year ago

15) $A_{11\text{-}20,i,p,}$ The area of stratum i in land parcel p that was harvested between 11 and 20 years ago

16) $A_{t^*,}$ Cumulative area harvested until time t*

17) A_{sp}, Area of sample plot sp

The data and parameters need to be monitored, as well as the monitoring equipment and procedures are listed below:

1) Illegal Logging PRA Results;

2) Result of Limited Illegal Logging Survey

3) $A_{burn,i,t}$ Area burnt in stratum i at time t

4) $A_{dist,i,t}$,Area disturbed in stratum i at time t

5) $A_{DIST\_IL,i}$ Area potentially impacted by illegal logging in stratum i

6) $C_{DIST\_IL,i,t|PRJ}$ biomass carbon of trees cut and removed through illegal logging in stratum i at time t

7) AP_i Total area of illegal logging sample plots in stratum i

8) PMP_i Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries

9) A_i Area covered by stratum i

10) DBH^2 Diameter at breast height of tree

Parameters to be monitored	Monitoring equipment	Monitoring procedures	CEC conclusion
1 Illegal Logging PRA Results	Monitoring System and forest authority.	Ex-ante zero. In addition to the national and local law and policy to prevent the illegal logging, fire and other disease & insect pest, the project proponent has also taken comprehensive prevention measures. The actual situation will be confirmed by the forest authority during the monitoring period.	During the on-site inspection, CEC confirmed that the local forest authority has taken comprehensive forest protection measures to prevent the illegal logging, fire and other disease & insect pest. The measures include strengthening routine patrol, publicity and education.
2 Result of Limited Illegal Logging Survey	Monitoring System and forest authority.	Ex-ante zero. In addition to the national and local law and policy to prevent the illegal logging, fire and other disease & insect pest, the project proponent has also taken	During the on-site inspection, CEC confirmed that the local forest authority has taken comprehensive forest protection measures to prevent the illegal logging, fire and other disease & insect pest. The measures include

[2] As for the project tree species, there are no allometric equation applied in the project area, the average annual growth and biomass expansion method is adopted for the estimated calculation of carbon stock change. In the monitoring period, according to measure DBH and local volume table issued by local forest authority, the volume can be calculated, combined by the BCEF and CF, the carbon stock can be obtained.

		comprehensive prevention measures. The actual situation will be confirmed by the forest authority during the monitoring period.	strengthening routine patrol, publicity and education.
3 $A_{burn,i,t}$	Monitoring System and forest authority.	Ex-ante zero. In addition to the national and local law and policy to prevent the illegal logging, fire and other disease & insect pest, the project proponent has also taken comprehensive prevention measures. The actual situation will be confirmed by the forest authority during the monitoring period.	According to China Forest Law, all the local government in China should set up the forest protection organizations, and the local government should be responsible for the fire prevention and fighting. It also specifies that the fire season should be determined, during which, using fire is normally forbidden in open air. Also, the fire prevention facilities should be equipped in the forest land. When the forest fire broke out, the local government should immediately organize and fight the fire. During the on-site inspection, CEC confirmed that the local forest authority has taken comprehensive forest protection measures to prevent and fight the fire. The fire season is determined based on the local climate and rainfall. During the fire season, the local government takes all-round measures to prevent and fight fire. The contingency plan is developed to specify the responsibilities, standardize the procedure, strengthen the logistical support and ensure the fire

			fighting is scientific, safe and efficient. The forest authorities is required to sign the liability statement and their job will be assessed based on this. The civilians were exposed to such diverse fire prevention and fighting propagandizing as the slogans and the broadcastings filled the streets in forest area. Moreover, besides the automatic monitoring fire-fighting equipment, the fire aisle and observatory is also built, abundant fire prevention material is reserved. Frequently, the training and fire manoeuvre will be implemented, helping improve skills for fire fighting.
3 $A_{dist,i,t}$	Monitoring System and forest authority.	Ex-ante zero. In addition to the national and local law and policy to prevent other disease & insect pest, the project proponent has also taken comprehensive prevention measures. The actual situation will be confirmed by the forest authority during the monitoring period.	The Chinese government has established a set of laws and regulations to protect the national Forest. In China Forest Law, it regulates that all the local government in China should set up the forest protection organizations. During the on-site inspection, CEC confirmed that the local forest authority has taken comprehensive forest protection measures to prevent the disease & insect pest. The measures include routine patrol conducted by the forest police, frequent investigation by the forest authority, the contingency

			plan for the endangered disease & insect pest, automatic monitoring system, etc.
4 $A_{DIST\_IL,i}$	Monitoring System and forest authority.	Ex-ante zero. In addition to the national and local law and policy to prevent the illegal logging, the project proponent has also taken comprehensive prevention measures. The actual situation will be confirmed by the forest authority during the monitoring period.	The Chinese government has established a set of laws and regulations to protect the national Forest. In China Forest Law, it regulates that all the local government in China should set up the forest protection organizations. The China Forest Law also clearly stipulate the punishment for the illegal logging, which not only requires 5-10 times compensation of replanting, but also 2-10 times economic penalty. Definitely, in China, the timber harvest is tightly controlled by the forestry authority, the illegal logging is severely punished and is unlikely to happen, and during the monitoring period, the local forest authority will also be consulted for confirmation.
5 $C_{DIST\_IL,i,t\|PRJ}$	Monitoring System and forest authority.	Ex-ante zero. In addition to the national and local law and policy to prevent the illegal logging, the project proponent has also taken comprehensive prevention measures. The actual situation will be confirmed by the forest authority during the monitoring period.	The Chinese government has established a set of laws and regulations to protect the national Forest. In China Forest Law, it regulates that all the local government in China should set up the forest protection organizations. The China Forest Law also clearly stipulate the punishment for the illegal logging, which not only

			requires 5-10 times compensation of replanting, but also 2-10 times economic penalty. Definitely, in China, the timber harvest is tightly controlled by the forestry authority, the illegal logging is severely punished and is unlikely to happen, and during the monitoring period, the local forest authority will also be consulted for confirmation.
6 AP_i	As for the project area, illegal logging is unlikely to happen, the $C_{DIST\_IL,i,t\|PRJ}$ is ex-ante zero, there is no need for the illegal logging sampling. The monitoring equipment for AP_i is not applicable.	As for the project area, illegal logging is unlikely to happen, the $C_{DIST\_IL,i,t\|PRJ}$ is ex-ante zero, there is no need for the illegal logging sampling. The monitoring equipment for AP_i is not applicable.	During the on-site inspection, CEC confirmed that the local forest authority has taken comprehensive forest protection measures to prevent the illegal logging. The measures include The measures include strengthening routine patrol, publicity and education. Therefore, $C_{DIST\_IL,i,t\|PRJ}$ is ex-ante zero, there is no need for the illegal logging sampling.
7 PMP_i	Not applicable.	Not applicable, as the leakage factor of this project is zero, it is unnecessary to calculate PMP_i.	CEC validated the exclusion of activity shifting leakage and market leakage, and confirmed that the calculation of PMP_i is not applicable.
8 A_i	This parameter is sourced from the local second class forest investigation, which is implemented by Inner Mongolia autonomous region forestry survey and design institute.	The local second class forest investigation is implemented by Inner Mongolia autonomous region forestry survey and design institute based on the National Forest Resource Continuous Investigation Technical Regulation issued by the	CEC reviewed the National Forest Resource Continuous Investigation Technical Regulation, the local second class forest investigation, and the certification of Inner Mongolia autonomous region forestry survey and design institute, and confirmed that the suitability and eligibility of

		State Forestry Bureau.	the source of Ai is justified.
9 DBH	Tape measure	Tape measure is required, and the measuring location should be at breast height 1.3m above the ground, which is regulated in the National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau.	CEC reviewed the Forest Resource Continuous Investigation Technical Regulation and confirmed that the measurement method is in line with the national regulations.

Monitoring plan

The monitoring plan with monitoring parameters can determine changes in forest carbon stocks and greenhouse gas emissions from project activity; and determine changes in forest carbon stocks and greenhouse gas emissions from disturbance and illegal logging. Commonly accepted principles of forest inventory and management are implemented.

The ante stratification of the project area in the project scenario maybe adjust based sample because of:

a) unexpected disturbances occurring during the project crediting period affecting differently various parts of an originally homogeneous stratum and/or

b) forest management activities that are implemented in a way that affects the existing stratification in the project scenario.

Sample method

To monitoring the actual carbon stock changes of the Project, field sample method will be adopted with 1) adequate forest stratification, sample size estimation methods and consider uncertainty, 2) a sampling framework including sample size, plot size, plot shape and information to determine plot location according to the latest version of " Tool for calculation of the number of sample plots for measurements within A/R CDM project activity"
The sample plot calculation process is shown below:

Parameter	Unit	Description
n	dimensionless	Number of sample plots required for estimation of biomass stock within the project boundary

n_i	dimensionless	Number of sample plots allocated to stratum I for estimation of biomass stocks within the project boundary.

The sample plot is 0.04ha and at least 3 samples is selected in every stratum, As the sample size should be less than 100, then the total sample plot area should be less than 6 ha, which is small than 5% of the total project are(20526*5%=1026.3 ha). Therefore, the following simplified equation can be used for estimating the number of sample plots:

错误!未找到引用源。 (35)

Where:

n: Number of sample plots required for estimation of biomass stocks within the project boundary; dimensionless

$t_{VAL:}$ Two-sided Student's t-value at infinite degrees of freedom for the required confidence level; dimensionless

E: Acceptable margin of error (i.e. one-half the confidence interval) in estimation of biomass stock within the project boundary; tdm (or tdm· ha-1), i.e. in the units used for Si

错误!未找到引用源。Relative weight of the area of stratum i (i.e. the area of the stratum i divided by the project area); dimensionless

S_i:estimated standard deviation of biomass stock in stratum i; t d.m. (or tdm· ha^{-1})

i 1, 2, 3, ⋯biomass stock estimation strata within the project boundary

After the estimation of total number of sample plots (n), allocation of number of sample plots among strata is calculated as:

错误!未找到引用源。 (36)

where:

$n_{i:}$ Number of sample plots allocated to stratum i; dimensionless

n: Number of sample plots required for estimation of biomass stocks within the project boundary; dimensionless

错误!未找到引用源。Relative weight of the area of stratum i (i.e. the area of the stratum i divided by the project area);dimensionless

S_i: Estimated standard deviation of biomass stock in stratum i; t d.m. (or t d.m· ha^{-1})

i1, 2, 3,⋯ biomass stock estimation strata within the project boundary

For the project activity:

Based on the data of biomass stocks in a carbon pool in the project scenario, the estimation of number of sample plots required is shown in the table below:

Strata No	Stratum Name	Area (ha)	Mean tonnes C/ha	Standard Deviation (t C/ha)	Plot size (ha)	Wi	W_i * Si
Strata 1	Birch	10454.00	64.83	22.23	0.04	0.51	11.32
Strata 2	Larch	10072.00	54.47	40.98	0.04	0.49	20.11

		Number of Plots	
STRATA NO	Stratum Name	Plot Quantity	Rounded Plot Quantity
Total Sample Size		106.31	
Strata 1	Birch	38.29	39
Strata 2	Larch	68.01	69
TOTAL NUMBER OF PLOTS			**108**

Where the confidence level is 95% as required in the methodology VM0010 ver 1.3 and Df is ∞, therefore, t_{VAL} is 1.96.

CEC validated the sample plot calculation process indicated in the PD, and confirmed the calculation process is compliance with the "Tool for calculation of the number of sample plots for measurements within A/R CDM project activity", the calculation results is correct. In addition, the measurement method for the sample plot, data collection, checking, reporting, wood volume & precision calculation in the monitoring period will be implemented according to The National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau.

QA/QC

Standard operating procedures (SOPs) and quality control/quality assurance (QA/QC) procedures for forest inventory including field data collection and data management will be applied. SOPs already applied in national forest monitoring or available from published handbooks or from the IPCC GPG LULUCF 2003 will be used.

CEC reviewed the National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau in 2004, which stipulates the Standard Operating Procedures (SOPs) and quality control/quality assurance (QA/QC) procedures for forest inventory including field data collection and data management applied.

It adopts the fixed sample spot method and applies to all the forest resources investigation. The detailed investigation procedure includes:

Working out the forest resource investigation plan, technical scheme and operating details;

Designing the sample plot, field work investigation and auxiliary data collection;

Collecting, analyzing and assessing the data of the sample plot;

All data collected as part of monitoring will be archived electronically and be kept at least for 2 years after the end of the project crediting period. All measurements will be conducted according to relevant standards. Data archiving shall take both electronic and paper forms, and copies of all data shall be provided to each project participant.

The archives shall include:

- Copies of all original field measurement data, laboratory data, data analysis spreadsheets;
- Estimates of the carbon stock changes in all pools and non-CO2 GHG and corresponding calculation spreadsheets;
- GIS products; and
- Copies of the measuring and monitoring reports.
- Conservative approach and uncertainty

Project proponents will also apply all relevant equations for the ex-ante calculation of net anthropogenic GHG removals by sinks with care and provide transparent estimations for the parameters that are monitored during the project crediting period. These estimates shall be based on measured or existing published data where possible and project proponents should retain a conservative approach; that is, if different values for a parameter are equally plausible, a value that does not lead to over-estimation of net anthropogenic GHG removals by sinks must be selected.

An uncertainty analysis is required for all estimates from monitoring related to change in area, change in carbon stocks and emissions for both the baseline and project case.

In conclusion, CEC confirmed that data and parameters used for the quantification of GHG emission reductions and/or removals has been provided in accordance with the methodology, and quality management procedures to manage data and information has been applied and established. The monitoring plan has met the requirements of the methodology and the tools applied.

3.3 Non-Permanence Risk Analysis

The non-permanence risk analysis should be conducted according to the AFOLU Non-Permanence Risk Tool (version 3.3). PP provided the non-permanence risk report (version 03, 01/11/2017) and the relevant documentation, the non-permanence risk is analysed as below:

Step 1.Risk Analysis

Sub-step 1.1: Internal Risks

According to the AFOLU Non-Permanence Risk Tool (version 3.3), project management (PM), financial viability (FV), opportunity cost (OC), project longevity (PL) shall be assessed using the specified table. Every risk factor has been identified and the relevant risk rating has been presented in the non-permanence risk report as bellows:

Project Management

Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located.	Not Applicable
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued.	Not Applicable
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years experience in the area).	Not Applicable
d)	Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	Not Applicable
e)	**Mitigation:** Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.	Not Applicable
f)	**Mitigation:** Adaptive management plan in place.	-2[3]
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		**-2**

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	3[4]
b)	Project cash flow breakeven point is greater than 7 and up to 10 years from the current risk assessment	Not Applicable
c)	Project cash flow breakeven point greater than 4 and up to 7 years from the current risk assessment	Not Applicable
d)	Project cash flow breakeven point is 4 years or less from the current risk assessment	Not Applicable

[3] Through reviewing the management regulations, CEC confirmed that the project proponent has established a complete set of management regulation in the operation & maintenance, disturbance prevention and the related contingency plan.

[4] Through reviewing the NPV calculation spreadsheet, CEC confirmed that the project cash flow breakeven point from the current risk is greater than 10 years.

e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	Not Applicable
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	Not Applicable
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	Not Applicable
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	Not Applicable
i)	**Mitigation**: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven.	Not Applicable
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		**3**

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated.	8[5]
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to100% more than from project activities	Not Applicable
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities	Not Applicable
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated	Not Applicable
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	Not Applicable
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	Not Applicable
g)	**Mitigation**: Project proponent is a non-profit organization	Not Applicable

[5] Through reviewing the NPV calculation spreadsheet, NPV from the most profitable alternative land use activity is ¥17,313, however the NPV from the project activity is negative.

h)	**Mitigation**: Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over the length of the project crediting period.	-2[6]
i)	**Mitigation**: Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over at least 100 years	Not Applicable
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may not be less than 0.		**6**

Project Longevity		
a)	Without legal agreement or requirement to continue the management practice	= 24 - (project longevity/5)
b)	With legal agreement or requirement to continue the management practice [7]	= 30 - (project longevity/2) =30-30/2=15
Total Project Longevity (PL) May not be less than zero		**15**

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	=−**2+3+6+15=22**

Sub-step 1.2: External Risks

According to the AFOLU Non-Permanence Risk Tool (version 3.3), land and resource tenure (LT), community engagement (CE), political risk (PC), project longevity shall be assessed using the specified table. Every risk factor has been identified and the relevant risk rating has been presented in the non-permanence risk report as bellows:

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource access/use rights are held by same entity(s)	0[8]

[6] CEC reviewed the VCS development consultation and service agreement signed between Inner Mongolia Keyihe Forest Industry LLC. and Beijing Shengdahuitong Carbon Management Co., Ltd. and confirmed that project is protected by legal binding commitment with at least 30 years over the length of the project crediting period. .

[7] CEC reviewed the VCS development agreement signed between PP and the companies and the farmers and confirmed that the project period will be at least 20 years stipulated in their cooperation agreement..

[8] Through reviewing the Land Right Certificates of the Project and the business licence of PP, CEC confirmed that the ownership and resource access/use rights are held by same entity, which is Inner Mongolia Keyihe Forest Industry LLC.

b)	Ownership and resource access/use rights are held by different entity(s) (eg, land is government owned and the project proponent holds a lease or concession)	Not Applicable
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership	Not Applicable
d)	There exist disputes over access/use rights (or overlapping rights)	Not Applicable
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts.	Not Applicable
f)	**Mitigation**: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period.	-2[9]
g)	**Mitigation**: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims	Not Applicable
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)] Total may not be less than zero.		**0**

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted	Not Applicable
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted	Not Applicable
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	-5[10]
Total Community Engagement (CE) [where applicable, (a + b + c)] Total may be less than zero.		**-5**

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating

[9] CEC reviewed the the VCS development consultation and service agreement signed between Inner Mongolia Keyihe Forest Industry LLC. and Beijing Shengdahuitong Carbon Management Co., Ltd. and confirmed that project is protected by legal binding commitment with at least 30 years over the length of the project crediting period.

[10] Based on the on-site inspection and interviewing with stakeholder, the stakeholders have positive attitude towards the implementation of the project, they agree that the project generates net positive impacts on the social and economic well-being of the local communities.

a)	Governance score of less than -0.79	Not Applicable
b)	Governance score of -0.79 to less than -0.32	4[11]
c)	Governance score of -0.32 to less than 0.19	Not Applicable
d)	Governance score of 0.19 to less than 0.82	Not Applicable
e)	Governance score of 0.82 or higher	Not Applicable
f)	**Mitigation**: Country is implementing REDD+ Readiness or other activities, as set out in this Section 2.3.3.	-2[12]
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] Total may not be less than zero.		**2**

External Risk	
Total External Risk (LT + CE + PC) Total may not be less than zero.	=0

Sub-step 1.3: Natural Risks

According to the AFOLU Non-Permanence Risk Tool (version 3.3), natural Risks shall be assessed using the specified table. Every risk factor has been identified and the relevant risk rating has been presented in the non-permanence risk report as bellows:

Natural Risks					
	Likelihood				
Significance	Less than every 10 years	Every 10 to less than 25 years	Every 25 to less than 50 years	Every 50 to less than 100 years	Once every 100 years or more, or risk is not applicable to the project area[13]

[11] http://info.worldbank.org/governance/wgi/index.aspx#home

[12] China has an established Designed National Authority under the CDM and has at least one registered CDM Afforestation/Reforestation project. Thus, the mitigation discount can be applied.

[13] Through interviewing with the local forestry administration, CEC confirmed that the risks identified (i.e. fire, pest and disease outbreaks, extreme weather events, geological risk, and any other natural risks) is not applicable to the project area.

Catastrophic(70% or more loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Devastating (50% to less than 70% loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Major(25% to less than 50% loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Minor (5% to less than 25% loss of carbon stocks)	Not applicable	Not applicable	Not applicable	Not applicable	0
Insignificant(less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event)	Not applicable	Not applicable	Not applicable	Not applicable	0
No Loss	Not applicable	Not applicable	Not applicable	Not applicable	0
LS Score					
Mitigation					
Prevention measures applicable to the risk factor are implemented					0.5
Project proponent has proven history of effectively containing natural risk					0.5
Both of the above					0.25
None of the above					Not applicable

Score for each natural risk applicable to the project (Determined by (LS × M)	
Fire (F)	0
Pest and Disease Outbreaks (PD)	0

Extreme Weather (W)	0
Geological Risk (G)	0
Other natural risk (ON)	0
Total Natural Risk (as applicable, F + PD + W + G + ON)	**0**

Step 2: Overall non-permanence risk rating and buffer determination

According to the above step, the overall non-permanence risk rating is as bellows:

Risk Category	Rating
a) Internal Risk	22
b) External Risk	0
c) Natural Risk	0
Overall Risk Rating (a + b + c)	**22**

Through reviewing the non-permanence risk report and the documents provided by PP (e.g. the business license, development agreement, financial analysis calculation, etc.), and other public available information (e.g. WGI published by World Bank, etc.), CEC confirmed that the risk score of every risk factor is appropriate, the non-permanence risk analysis is correctly conducted according to the AFOLU Non-Permanence Risk Tool (version 3.2) based on the actual situation of the project.

CL05 was raised requesting the PP to provide Non-Permanence Risk Analysis according to the AFOLU Non-Permanence Risk Tool v3.3. The PP provided the Non-Permanence Risk Report. Through reviewing the report, the validation confirmed that the Non-Permanence risk analysis is correctly conducted according to the AFOLU Non-Permanence Risk Tool (version 3.3) and the buffer credits is correctly calculated. Hence, **CL05** was closed.

4 SAFEGUARDS

4.1 No Net Harm

There is no potential negative environmental or socio-economic impact due to the project.

4.2 Environmental Impact

As the AFOLU is environment-friendly project and Environmental Impact Assessment (EIA) is not required for logged to protected forest projects according to the latest “EIA category management list for construction projects” issued by the Ministry of Environmental Protection of People’s Republic of China on Mar 19th,2015. The key mitigation action of the project activity is avoiding the illegal harvest of the forest, which can protect and improve the surviving environment, keep the ecological balance, save the species resources and enhance homeland security.

4.3 Local Stakeholder Consultation

The survey was conducted by distributing 40 questionnaires and collected the stakeholders' comments on Dec, 2012. The summary of comments presented in the PD has been cross-checked with the questionnaires and found to be complete.

4.4 Public Comments

This project was open for public comment from 26 September 2017 - 25 October 2017(http://www.vcsprojectdatabase.org/#/pipeline_details/PL1718). No comments were received.

5 VALIDATION CONCLUSION

CEC has performed the validation of Inner Mongolia Keyihe IFM (conversion of logged to protected forest) Project owned by Inner Mongolia Keyihe Forest Industry LLC., which applied the methodology VM0010 version 1.3. The validation was performed on the basis of VCS Standard version 3.7 and host country criteria and also on the criteria given to provide for consistent Project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) on-site visit and follow-up interviews with local stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Through detailed analysis of the Project, it is concluded that the Project is likely to result in reductions of GHG emissions. The VT0001 VCS AFOLU Additionality Tool v3.0 has been applied to demonstrate that the Project is not a plausible baseline scenario. Emission reductions attributable to the Project are hence additional to any that would occur in the absence of the Project. Given that the Project is implemented and maintained as designed, the Project is likely to achieve the estimated average annual emission reductions are 100,279 tCO_2e and 3,008,381 tCO_2e over the chosen30-year crediting period, without buffer deduction, the annual and the total emission reductions are 128,563 and 3,856,915tCO_2e respectively.

The review of the project description (version 03) and the subsequent follow-up interviews have provided CEC with sufficient evidences to determine the fulfilment of stated criteria. The PD (version 03) was subsequently revised on 15/11/2017 to resolve the issues raised during the interviews and subsequent interactions. In our opinion, the Project correctly applies and meets the relevant VCS requirements according to "VCS Standard version 3.7" and "Agriculture, Forestry and Other Land Use (AFOLU) Requirements Version 3.6".

6 REFERENCE

/1/ VCS-PD version 03 dated 15/11/2017

/2/ ER calculation spreadsheet version 03 dated 15/11/2017

/3/ Uncertainty Analysis spreadsheet version 03 dated 15/11/2017

/4/ Non-Permanence Risk Report version 03 dated 15/11/2017

/5/ VM0010 version 1.3 dated 28/04/2016

/6/ VCS Standard version 3.7 dated 21/06/2017

/7/ Agriculture, Forestry and Other Land Use (AFOLU) Requirements Version 3.6 dated 21/06/2017

/8/ Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities" (VT0001 VCS AFOLU Additionality Tool v3.0) dated 01/02/2012

/9/ AFOLU Non-Permanence Risk Tool, VCS version 3.3 dated 19/10/2016

/10/ Tool for the "Calculation of the number of sample plots for measurements within A/R CDM project activities" (version 02.1.0) approved by the CDM Executive Board.

/11/ VCS Validation and Verification Manual, version 3.2, dated 19/10/2016

/12/ Business license of Inner Mongolia Keyihe Forest Industry LLC.

/13/ The notice on the forbidding commercial logging issued by Keyihe Forestry Bureau on 18/12/2012

/14/ VCS development consultation and service agreement signed between Inner Mongolia Keyihe Forest Industry LLC. and Beijing Shengdahuitong Carbon Management Co., Ltd. on 20/12/2012

/15/ Timber harvest plan issued by Keyihe forest bureau

/16/ Forest second class investigation data by Inner Mongolia autonomous region forestry survey and design institute

/17/ The certificate of Inner Mongolia autonomous region forestry survey and design institute (Certificate number: A 05-001，valid from 01/07/2013 to 30/06/2018)

/18/ Agriculture land Right Certificates of the Project

/19/ Maps of the Project

/20/ Statement on financial indicators of Keyihe forest bureau issued by Keyihe Forestry Bureau on 18/04/2017.

/21/ Statement on the growth volume in Keyihe issued by Inner Mongolia autonomous region forestry survey and design institute on 11/2017

/22/ Stakeholder's questionnaires

/23/ http://v-c-s.org

/24/ 13th Five-year Forest Harvest Limit issued by State Council (Guohan [2016] No.32)

/25/ The Notice of the Review Opinion published by the State Council

/26/ National Forestry Law of China

/27/ "Land Use Change and Forestry GHG Inventory (2013)" of "Second national information notification on China

/28/ Forestry Part of China's greenhouse gas emissions list

/29/ National Forest Resource Continuous Investigation Technical Regulation issued by the State Forestry Bureau

/30/ Tool for calculation of the number of sample plots for measurements within A/R CDM project activity

/31/ IPCC Guidelines for National Greenhouse Gas Inventories (2006), Table 4.9.

APPENDIX A: RESOLUTION OF CORRECTIVE ACTION /CLARIFICATION / FORWARD ACTION REQUESTS

Draft report clarifications and corrective action requests by validation team	Summary of project participant response	Validation team conclusion
CAR01 was raised that the ER calculation should be correct according to the applied methodology. The documented evidence should be provided on the data and parameters used in the ER calculation.	PP revised the ER calculation in the PD version 03according to the methodology. Additionally, the reasonable data source was described in the PD and also provided.	CEC reviewed the data source of every parameters used in the ER calculation, and confirmed the data source is reasonable and consistent with the actual situation of the project. CEC also checked the revised PD and ER calculation sheet, and found the ER calculation process is reproducible and the result is correct. Hence, CAR01 is closed.
CL01 was raised requesting the PP to provide the evidence of the project starting date.	The notice issued by the local forest authority to forbidding commercial logging, was provided to prove the starting date of the project is 01/01/2013.	CEC checked the notice on the s forbidding commercial logging issued by by Keyihe Forestry Bureau on 18/12/2012. It is indicated in this notice that strictly forbidden in the project area. Therefore, the project start date is 01/01/2013 is reasonable. Hence, CL01 was closed.
CL02 was raised requesting the PP to describe the timber harvest plan according to the applied methodology Box 1.	The timber harvest plan is supplemented in the revised PD according to the applied methodology and timber harvest and management plan of the project.	The revised PD added the timber harvest plan and the timber harvest schedule, sourced from the timber harvest a plan of the project, and consistent with the applied methodology. Hence, CL02 was closed.
CL03 was raised that requesting PP to provide the data source of the basic parameters used in financial analysis and sensitivity analysis should be conducted.	The data source of parameters used in financial analysis is clearly stated in the PD. The NPV calculation sheet including sensitivity analysis was also provided to DOE.	CEC checked the NPV calculation sheet against with the evidences provided, found the key parameters are soured from the Statement on financial indicators of Keyihe forest bureau issued by Keyihe Forestry Bureau on 18/04/2017.Hence, CL03 was closed.
CL04 was raised requesting the PP to provide transparent calculation process and related evidence for the determination of uncertainty.	The uncertainty analysis calculation spreadsheet has been provided to DOE for validation.	The PP provided the uncertainty analysis calculation spreadsheet of the project. The validation team checked the spreadsheet and confirmed that the calculation process has been conducted according to the Methodology,

		related evidence has also been provided and validated by CEC. The result has been correctly calculated. Hence, CL04 was closed.
CL05 was raised requesting the PP to provide Non-Permanence Risk Analysis according to the AFOLU Non-Permanence Risk Tool v3.3.	The Non-Permanence Risk Analysis has been provided to DOE for validation.	The PP provided the Non-Permanence Risk Report. Through reviewing the report, the validation confirmed that the Non-Permanence risk analysis is correctly conducted according to the AFOLU Non-Permanence Risk Tool (version 3.3) and the buffer credits is correctly calculated. Hence, CL05 was closed.

APPENDIX B CERTIFICATE

List of Assessment Team

Validation Team	Role	Qualification	Specific scope	Participated in the on-site visit
XUE Jinghua	Team Leader	Auditor	--	√
ZHANG Huan	Team Member	Auditor	--	√
WU Xiuli	Team Member	Technical Expert	√	√

Technical Review	Role	Specific Scope	Participated in the on-site visit
CUI Xioadong	Technical Reviewer	--	--
ZHANG Xiaoquan	Technical Reviewer	√	--

Brief background information of assessment team:

Xue Jinghua is a lead Greenhouse Gas(GHG) assessor. She has attended extensive internal and external training courses on EMS, energy audit, CDM and CDM related knowledge since 2007. She has participated in over 30 validation/verification CDM projects in the areas of hydropower, wind power, coal mine methane recovery and utilization, waste heat recovery and landfill gas recovery and utilization. Besides CDM auditing, Ms. Xue has also participated in the assessment of hydroelectric projects against the criteria set by the World Commission on Dams and energy saving auditing.

Zhang Huan is a Greenhouse Gas (GHG) assessor. She has attended various internal and external training courses on CDM, GS, ISO14064, GHG protocol, Energy Performance Contracting (EPC), environmental labeling and other GHG related training courses. Since she joined CEC in 2012, she has participated in and finished several CDM, ISO14064 and EPC auditing in the area of renewable energy, green lighting, energy system optimization.

Wu Xiuli is a technical expert in technical areas 14.1. She gained Master Degree in Garden and Senior Engineer. She has worked in National Forestry Bureau for more than 15 years, gaining extensive working experiences in Forestry Technical Area. During the work, Mrs. Wu was responsible for forestry (architecture) teaching, scientific research and management work. She also drafted the "national forestry and ecological construction management mode". She involved in various CDM conference and training courses since 2010 and attended more than 20 hours CDM training.

Cui Xiaodong is a lead Greenhouse Gas(GHG) assessor. He has attended various internal and external training courses on EMS, energy audit, CDM related knowledge and GHG accounting related courses since 2009. He has participated in and finished over 10 validation/verification CDM/VCS projects both in China and abroad in the areas of hydropower, wind power and biomass power generation.

Zhang Xiaoquan is a Greenhouse Gas(GHG) assessor. He worked as a management staff in state-owned forest farm for over 10 years before come to CEC. He is an experienced senior EMS/ QMS Auditor and Environmental Labeling auditor, who has also completed various CEC CDM training courses and GHG accounting related courses since 2007.

XUE Jinghua

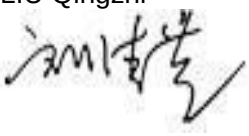
Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area (s): 1.2

Beijing, 25 Sep 2015

LIU Qingzhi



XU Linghua

ZHANG Huan

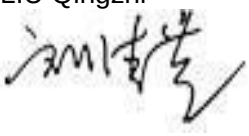
Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area (s): 1.2

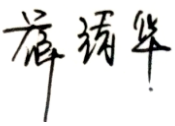
Beijing, 25 Sep 2015

LIU Qingzhi



CDM Supervisor, Technical Director

XUE Jinghua



Quality Assurance Management Division

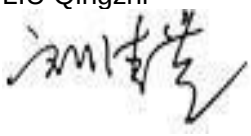
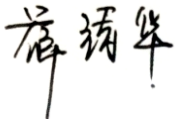
WU Xiuli

Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Technical Expert: Yes

Industry Sector Expert for Technical Area(s): 14.1

Beijing, 25 Sep 2015

LIU Qingzhi	XUE Jinghua
	
CDM Supervisor, Technical Director	Quality Assurance Management Division

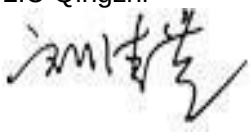
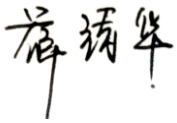
CUI Xiaodong

Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area (s): 1.1, 1.2

Beijing, 25 Sep 2015

LIU Qingzhi	XUE Jinghua
	
CDM Supervisor, Technical Director	Quality Assurance Management Division

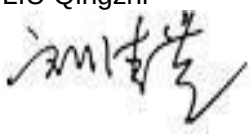
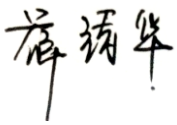
ZHANG Xiaoquan

Qualification in accordance with CEC-4001C-C/1.2 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area(s): 14.1

Beijing, 25 Sep 2015

LIU Qingzhi	XUE Jinghua
	
CDM Supervisor, Technical Director	Quality Assurance Management Division