Validation report form for

Gold Standard Project activity

BASIC INFORMATION	
Title of the Project Activity (PA)	Jintai Animal Manure Management System GHG Mitigation Project
GS Reference Number	GS-12048
Version number of the validation report	1.0
Completion date of the validation report	13/11/2023
Version number of PDD to which this validation report applies	Version 04, dated 17/10/2023
Start Date of PA	21/12/2021
Project Participant	Henan Deneng Energy&Environmental Protection Technology Co., Ltd.
Host Party	China
SDG Targeted:	1.SDG 8: Decent work and Economic Growth (8.5.1) 2.SDG 12: Responsible consumption and production (12.5.1) 3.SDG 13: Climate Action (13.2)
Applied methodologies and standardized baselines	ACM0010 “GHG emission reductions from manure management systems” (Version 08.0)
Mandatory sectoral scopes	1 and 13
Activity Requirements applied	Community Services Activities
Product Requirements applied	GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)
Name and UNFCCC reference number of the VVB	E-0052: Carbon Check (India) Private Limited
Name, position and signature of the approver of the validation report	 Vikash Kumar Singh, Compliance Officer

SECTION A.Executive summary

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Purpose and general description

Henan Yangxiang Breeding Co., Ltd, has appointed the VVB, Carbon Check (India) Private Ltd. to perform an independent validation of the Gold Standard PA “Jintai Animal Manure Management System GHG Mitigation Project ” in China (hereafter referred to as “PA”). This report summarises the findings of validation of the project, performed on the basis of Gold Standard criteria Gold standard for global goals (GS4GG), as well as criteria given to provide for consistent project operations, monitoring and reporting. This report contains the findings and resolutions from the validation and a validation opinion.

The project activity introduces new animal waste management systems to treat the manure from swine farms in Liaoning Province. The purpose of the project activity is to treat the manure and wastewater to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The project activity treats organic wastes to fertilizer through controlled aerobic treatment by composting of manure and biomass residue which can avoid Methane emissions from uncovered anaerobic lagoons and anaerobically in a solid waste disposal site. An Animal Manure Management System (AWMS) has been installed swine farm respectively which treat the manure and wastewater from swine farms. All the manure and wastewater is collected into waste collecting tanks and then be separated first by Solid-liquid separator, and by a Upflow Anaerobic Sludge Bed Reactor (UASB) as its anaerobic digester technologies, then the biogas generated. The fermented sludge from the aerobic composting system is used to produce organic fertilizer, which partly distributed to the surrounding farmers freely. The project is expected to achieve 105,659 tCO_2e of emission reduction annually and total emission reduction of 528,294 tCO_2e during the first renewable 5-year crediting period.

The project activity enables swine farm to use new animal waste management systems instead of the open anaerobic lagoons in baseline scenario to achieve the harmlessness and ecological utilization of the swine manure.

The purpose of validation is to have a thorough and independent assessment of the proposed PA against the applicable GS requirements, in particular, the project's baseline, monitoring plan and the PA’s compliance with relevant Gold standard criteria and host Party criteria. These are validated to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all Gold Voluntary projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of voluntary emission reductions (VERs).

Location

Host Party(ies): China
Region/State/Province: Liaoning province
City/Town/Community: Sunjiatun Village, Xinnongcun Township, Xinmin city

Scope of the validation

The validation scope is defined as the independent and objective review of the project design document (PDD /01/). The PDD /01/ is reviewed against the relevant criteria (see above) and decisions by the Gold standard, including the approved baseline and monitoring methodology.

The validation is not meant to provide any consulting towards the project participant. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

While carrying out the validation, CCIPL determines if the PA complies with the requirements of the paragraph 37 of the CDM Modalities & Procedures, the applicability conditions of the selected methodology /38/, guidance issued by the Gold Standard and also assess the claims and assumptions made in the PDD /01/ without limitation on the information provided by the project participants.

Validation Process

The validation consists of the following four phases:

i.A desk review of the project design documents

- A review of the data and information;
- Cross checks between information provided in the PDD /01/ and information from sources with all necessary means without limitations to the information provided by the project proponent;
- Submission of Validation work plan to the PP

ii. Follow-up interviews with project stakeholders
- Interviews with relevant stakeholders in host country with personnel having knowledge of the project development via telephone, email, online etc.;
- Cross checking between information provided by interviewed personnel with all necessary means without limitations to the information provided by the project proponent;

iii. Reference to available information relating to projects or technologies similar projects under validation and review based on the approved methodology /38/ being applied for the appropriateness of formulae and accuracy of calculations.

iv. The resolution of outstanding issues and the issuance of the final validation report and opinion.

The report is based on the assessment of the PDD /01/ undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews and stakeholder interviews, review of the applicable/applied methodology /38/ and their underlying formulae and calculations.

This report contains the findings and resolutions from the validation and a validation opinion on the proposed PA thus confirming the Project design in the documents is sound and reasonable and meets the stated requirements and identified criteria.

Conclusion

CCIPL has performed the validation of the GS PA "Jintai Animal Manure Management System GHG Mitigation Project" having GS Ref. Number GS12048. The actual project design are consistent with the PDD which will create estimated emission reduction from the project is 528,294 tCO_2e during the first renewable 5-year crediting period.
In CCIPL's opinion, PDD, supporting documentation and subsequent follow up actions have provided with sufficient evidence to determine the fulfilment of stated GS4GG criteria. CCIPL confirmed that each SDG Impacts were estimated correctly on the basis of the approved ACM0010 "GHG emission reductions from manure management systems" (Version 08.0) and the Global Goals Principles and Requirements. Therefore, this is being submitted for request for design certification, as per GS procedures as applicable.

SECTION B.Validation team, technical reviewer and approver

B.1.Validation team members

No.	Role	Type of resource	Last name	First name	Affiliation	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	Mathew	Vijay	CCIPL	X	X	X	X
	Technical Expert	IR	Anand	Amit	CCIPL	X	N	N	X
2.	Trainee Assessor	IR	A L	Hariprasath	CCIPL	X	X	X	X
3.	Trainee Assessor	IR	Maria John	Linta	CCIPL	X	N	N	X
4.	Local Expert	IR	Shen	Nara	CCIPL	X	X	X	X

B.2.Technical reviewer and approver of the validation report

No.	Role	Type of resource	Last name	First name	Affiliation
1.	Technical reviewer	IR	Ranganathan	S	CCIPL

2.	Approver	IR	Singh	Vikash Kumar	CCIPL

Audit Team Experience:

Vijay Mathew: is an appointed Team Leader. He has been involved in carbon offset mechanisms/sustainability standards for more than 14 years. He has completed his Master of Science (M.Sc.) in Energy Systems, Master of Business Administration (M.B.A) and Master of Commerce (M.Com). He has also completed his Post Graduate Diploma in International Business Operations (PGD-IBO) and Post Graduate Diploma in Fire Protection and Safety (PGD-FPS). He is certified Lead Auditor/Assessor in various standards viz. ISO 9001:2015, SA 8000: 2014, ISO 14001:2015, ISO 14064-1:2018, ISO 50001:2018, ISO 45001: 2018 and BS OHSAS 18001: 2007 etc. He has experience in the field of Carbon Offsets both in the regulatory and voluntary front, including project validation. He has participated in GS, VCS, GCC and CDM validations and validations. He has been involved in verification/validation of more than 100 Carbon offset projects. He has also attended several Gold Standard VVB webinar trainings and GS4GG trainings. He is qualified as technical expert for TA 1.1, 1.2, 3.1,13.1 and 13.2 under CDM SS/TA categorization.

Amit Anand: Qualified lead assessor and internal technical reviewer for offset projects validations and verifications under CDM, VCS and Gold Standard (GS) and actively been involved in the validation and verification or internal technical review of more than 200 offset projects. He is qualified as technical expert for TA 1.2, 3.1, 8.1, 13.1 and 14.1 under CDM Sectoral Scope categorization. He has a professional experience of more than 12 years in various capacities with organizations like MITCON, TUV Rheinland, Deloitte and MGM International in the development and validation/verification of carbon offset projects under different market-based mechanism. He was also involved in validation and verification the following Gold Standard Projects: GS 1078, GS 976, GS 850, and GS 916 PoA (GS 1231 (VPA 01) GS 1029 (VPA 02), GS 1030(VPA 03), GS 1031(VPA 04).

Ranganathan Seshan: Holds a Bachelor's Degree in Chemical Engineering and has an overall working experience of around thirty nine years with twenty four years' experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat -recovery, efficiency studies of boilers ,power plants, safety audits and pollution control activities including waste water treatment, project management, corporate planning, sales, logistics in fertilizer & petrochemical industry. The experience also includes 5 years in process design & engineering for chemical process industry. He is qualified validator, verifier and technical reviewer and has fifteen years' experience working with leading certification bodies. He is involved in the validation/verification of over 200 projects in various roles.

Hariprasath A L: He is appointed as Trainee Assessor and also attended many GS workshops/ webinars.

Linta Maria John: He is appointed as Trainee Assessor and also attended many GS workshops/ webinars.

SECTION C.Means of validation

C.1.Desk/document review

>> List of all documents reviewed or referenced during the validation is provided in Appendix-3.

C.2.On-site inspection

Duration of on-site inspection: 20/06/2023				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	•General information about the project. •Barriers faced/overcome in the processes (additionality) •Local Stakeholder consultation processes •Legal/ Statutory Clearances and Agreements Signed •Baseline determination	Sunjiatun Village, Xinnongcun Township, Xinmin city, Liaoning Province	20/06/2023	Vijay

	•Application of appropriate Methodology •Operation and maintenance Procedures •Technical details of project •Data monitoring and storage practices •Calibration and maintenance requirement of the equipment Monitoring Methodology			Mathew, Nara & Hariprasath A L
2.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD	Sunjiatun Village, Xinnongcun Township, Xinmin city, Liaoning Province	20/06/2023	Vijay Mathew, Nara & Hariprasath A L

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Xu	Saijun	Henan Deneng	20/06/2023	•Discussion on Project Design and eligibility criteria •Proposed Technology to be used in the PA •PP Management System Manual • Discussion on project funding and involvement of any ODA •Discussion on the PA PDD and ER sheet •Discussion on the GS preliminary review comments •Sustainability aspects of the PA SDG impacts, Local stakeholder consultation and Baseline	Vijay Mathew, Nara & Hariprasath A L

					survey of the project activity	
2.	Zhang	Cheng	Kai Feng Guo Tran	20/06/2023	Discussion on the implementation procedures and Operation and maintenance. Local stakeholder consultation and Baseline survey of the project activity	
3.	Zhang	Yang feng	Jintai Yangxiang	20/06/2023	Discussion on the implementation procedures and Operation and maintenance. Local stakeholder consultation and Baseline survey of the project activity	Vijay Mathew, Nara & Hariprasath A L
4.	Wang	Hongbin	Government Official	20/06/2023	Local stakeholder consultation and Baseline survey of the project activity, organic fertilizer distribution.	Vijay Mathew, Nara & Hariprasath A L
5.	Liu	Yewei	Villager	20/06/2023	Local stakeholder consultation and Baseline survey of the project activity, organic fertilizer distribution	Vijay Mathew, Nara & Hariprasath A L

C.4.Sampling approach

N/A

C.5.Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Project design document	-	-	-
Description of project activity	CL 02	CAR 01 CAR 03	-
Management system	-	-	-
Start date, crediting period type and duration	-	-	-
Environmental impacts	-	-	-
Local stakeholder consultation	-	-	-
Application and selection of methodologies and standardized baselines	-	CAR 04	-
-Application of methodologies and standardized baselines	-	-	-
-Deviation from methodology and/or methodological tool	-	-	-
-Clarification on applicability of methodology, tool and/or standardized baseline	-	-	-
-Project boundary, sources and GHGs	-	-	-
-Baseline scenario	-	CAR 05	-
-Demonstration of additionality	CL 03 CL 06	CAR 02	-
-Proof of Project eligibility	-	-	-
-Safeguarding Principles Assessment	-	-	-
-Estimation of emission reductions or net anthropogenic removals	CL 09	CAR 06	-
-Monitoring plan	CL 04 CL 05 CL 08 CL 10	CAR 07	-
Sustainable development co-benefits	CL 01 CL 07	-	-
Stakeholder Inputs & Grievance Mechanism	CL 11	-	-
Others (GS Preliminary review)	-	-	-
Total	11	7	-

SECTION D.Validation findings

D.1.Project Activity

D.1.1. **Project design document**

Means of validation	DR,I
Findings	No findings has been raised in this section.
Conclusion	This is an animal manure management system GHG mitigation project by replace the current open anaerobic lagoons with new closed anaerobic digesters of swine farms, then treat the manure and wastewater from the swine farms to avoid methane emissions generated in the baseline uncovered anaerobic lagoons which has been verified as actual by site inspection. The activity requirements applied is Community Services Activities. The project is expected to achieve 105,659 tCO_2e of emission reduction annually

	and total emission reduction of 528,294 tCO_2e during the first renewable 5-year crediting period. As per section 9.1.1 and9.1.2 of GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/, the project is a large-scale GS VER project. The proposed project is a retroactive project with the start date of 21/12/2021 and the stakeholder consultation physical meeting was conducted on 31/01/2023. The project applied CDM approved methodology ACM0010 “GHG emission reductions from manure management systems” (Version 08.0). Product Requirements applied is GHG Emissions Reduction & Sequestration. The validation team confirms that the process undertaken to describe the key information of the project is described above. The information of the project is justified from the terms mentioned in Key project information form in PDD which has been assessed by the validation team, and CCIPL confirms that the GS project activity qualifies the eligibility criteria for GS4GG project activities.

D.1.2. **Description of PA**

Means of validation	DR,I
Findings	CAR 01, CAR 03 and CL 02 had been raised in this regard and successful resolved. Please refer appendix 4 for details.
Conclusion	The description of the project activity contained in the PDD /01/ is transparent, detailed and provides a clear overview of the project. Its content was confirmed by means of document review /01/ and interviews to validate the accuracy and completeness of the project description. **i. Purpose and general description of project** The project activity introduces new animal waste management systems to treat the manure from swine farms in Liaoning Province. The purpose of the project activity is to treat the manure and wastewater to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The project activity treats organic wastes to fertilizer through controlled aerobic treatment by composting of manure and biomass residue which can avoid Methane emissions from uncovered anaerobic lagoons and anaerobically in a solid waste disposal site. An Animal Manure Management System (AWMS) has been installed swine farm respectively which treat the manure and wastewater from swine farms. All the manure and wastewater is collected into waste collecting tanks and then be separated first by Solid-liquid separator, and by a Upflow Anaerobic Sludge Bed Reactor (UASB) as its anaerobic digester technologies, then the biogas generated. The fermented sludge from the aerobic composting system is used to produce organic fertilizer, which partly distributed to the surrounding farmers freely. The same has been confirmed by site inspection and checking the Project Evaluation Report of the project/6/. The project activity enables swine farms to use new animal waste management systems instead of the open anaerobic lagoons in baseline scenario to achieve the harmlessness and ecological utilization of the swine manure, the biogas generated during the treatment process will be captured for hot water generation, and the residual biogas will be flared by internal combustion flare (closed flare) if there is any surplus biogas. The project is expected to achieve 105,659 tCO_2e of emission reduction annually and total emission reduction of 528,294 tCO_2e during the first renewable 5-year crediting period. **ii. Eligibility of the project under GS** The project activity meets the eligibility criteria of the GS4GG as per section 3.1.1 of

GS4GG Principles & Requirements/47/, section 3 of GS4GG Community Services Activity Requirements (Version 1.2)/49/ and section 2 of GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/ as below demonstration,

Requirements as per GS4GG Principles & Requirements	**Assessment for this project**
(a) Types of Project Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) Eligible projects shall include physical action/implementation on the ground. Pre-identified eligible project types are identified in the Eligibility Principles and Requirements section. Section 2.1.2 of *GS4GG Community Services Activity Requirements* (Version 1.2) All CSA Projects shall lead to climate change mitigation and/or adaptation by providing or improving access to services/resources at the household or community or institution level. Eligible services include electricity and energy, water and sanitation, waste management, housing, etc. Section 3.1.1 of *GS4GG Community Services Activity Requirements* (Version 1.2) Pre-identified CSA project types are a) Renewable energy; b) End-use energy efficiency; c) Waste management and handling; d) Water, sanitation and hygiene (WASH). Section 5.1.1 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* The Following Project types are eligible for issuance of GSVERs or GSCERs: a) Renewable Energy Supply; b) End-Use Energy Efficiency Improvement; c) Waste Handling & Disposal; d) Land Use and Forests.	Via site inspection, CCIPL confirmed that the project is to install new animal waste management systems to replace the current open anaerobic lagoons with new closed anaerobic digesters, in Sunjiatun Village, Xinnongcun Township, Xinmin city, Liaoning Province which will treat the manure and wastewater from the swine farms to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. Hence, the emission reduction credits will be avoided methane emissions generated through new animal waste managementsystems. Thus, the project is eligible under project type I "Waste management and handling: All waste management activities that deliver energy or a usable product with sustainable development benefits such as composting, biogas etc." as per the GS4GG 'Community Services Activity- Requirements' version 1.2 /49/. Also the project is eligible under section 5.1.1 (c) "Waste Handling & Disposal: The waste handling and disposal category refers to all waste handling Projects that deliver an energy service or a usable product with sustainable development benefits (e.g. composting)." of GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/. Finally via checking the section 4.1.3 of GS4GG Principles & Requirements (Version 1.2)/47/, it stated "A Project type is automatically eligible for Gold Standard Certification if there are Gold Standard approved Activity Requirements and/or Impact Quantification Methodologies associated with it or it's referenced in the Gold Standard Product Requirements", hence, CCIPL confirmed that the project type is automatically eligible for Gold Standard Certification.

	Hence, the project satisfied this eligibility requirement.
(b) Location of Project: Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) Projects may be located in any part of the world. Section 3.1.2 of *GS4GG Community Services Activity Requirements* (Version 1.2) Project Area and Boundary shall be defined in line with the applicable Impact Quantification Methodologies and Product Requirements. Section 3.1.1 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* Gold Standard VER Projects may be located in any host country or state. However, where host countries or states have mandatory operational schemes to reduce GHG emissions in any form (e.g., cap & trade, carbon tax etc.), Projects shall only be eligible if the Project Developer has either: (a) provided Gold Standard with satisfactory justification that no double counting of emission reductions occurs or (b) has committed to retiring eligible units equal to the quantity of Gold Standard VERs. Refer to Annex A of this document.	Via checking the PER/6/ and on-site inspection, CCIPL confirmed that the project is located in China which is an eligible host country as defined in section 2.1.6 of GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/. Furthermore, based on validation team's local expertise, China has a cap & trade scheme only cover the high-emission industries, such as power generation sector that emitted at least 26,000 tons of CO_2e/year which has been verified in the public website/56/, and CCIPL confirmed that the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information/57/. Besides, due to the project has unique identified GPS coordinates, hence, it can't be counted in any other voluntary market or emission reduction mechanism which has been checked by searching these schemes including CDM, CCER, VCS etc. Finally, via checking the Declaration of No Double Counting Statement/22/, CCIPL confirmed that the emission reductions will not be double counted. In conclusion, CCIPL verified that Project Developer has provided Gold Standard with satisfactory justification that no double counting of emission reductions occur.
(c) Project Area, Project Boundary and Scale: Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) The Project Area and Project Boundary shall be defined. Projects may be developed at any scale although certain rules, requirements and limitations may apply under specific Activity Requirements, Impact Quantification Methodologies and Products Requirements. In order to avoid double counting the Project shall not be included in any other voluntary or compliance	Project boundary has been defined in the PDD according to the applied methodology ACM0010/38/ as the geographical extent of the project boundary includes the site of the AWMS(s), including the flare and and the heat generation and considers the GHG emissions that come from AWMSs, including the GHGs emissions from the anaerobic digestion, GHG emissions from sludge treatment by aerobic composting and GHG emissions from flaring system in swine farm which is verified by checking the PER of the project/6/ and on-site inspection.

	standards programme unless approved by Gold Standard (for example through dual certification). Also, if the Project Area overlaps with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature, the project shall demonstrate that there is no double counting of impacts at design and performance certification (for example use of similar technology or practices through which the potential arises for double counting or misestimation of impacts amongst projects). Section 3.1.2 of *GS4GG Community Services Activity Requirements* (Version 1.2) Project Area and Boundary shall be defined in line with the applicable Impact Quantification Methodologies and Product Requirements. The definition of scale is the same for all Projects, except Microscale. Section 3.1.1 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* Gold Standard VER Projects may be located in any host country or state. However, where host countries or states have mandatory operational schemes to reduce GHG emissions in any form (e.g., cap & trade, carbon tax etc.), Projects shall only be eligible if the Project Developer has either: (a) provided Gold Standard with satisfactory justification that no double counting of emission reductions occur or (b) has committed to retiring eligible units equal to the quantity of Gold Standard VERs. Refer to Annex A of this document. Section 9.1.1 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* Standard VER Projects may be "large scale", "small scale" (for the applicability of methodologies and tools only) or "microscale". Scale is defined in the relevant Gold Standard Activity Requirements or where these do not exist then per following paragraphs. Section 9.1.2 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* All Projects exceeding the small-scale	Via checking the PER of the project/6/ and on-site inspection, CCIPL confirmed that the project is located in China which is an eligible host country as defined in section 2.1.6 of GS4GGGHG Emissions Reduction&Sequestration Product Requirements (Version 2.1)/51/. Furthermore, based on validation team's local expertise, China has a cap & trade scheme only cover the high-emission industries, such as power generation sector that emitted at least 26,000 tons of CO2e/year which has been verified in the public website/56/, and CCIPL confirmed that the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information/57/. Besides, due to the project has unique identified GPS coordinates, hence, it can't be counted in any other voluntary market or emission reduction mechanism which has been checked by searching these schemes including CDM, CCER, VCS etc. Finally, via checking the Declaration of No Double Counting Statement/22/, CCIPL confirmed that the emission reductions will not be double counted. In conclusion, CCIPL verified that Project Developer has provided Gold Standard with satisfactory justification that no double counting of emission reductions occur. The estimated emission reduction from the project is 105,659 tCO_2e per year checked by review ER sheet/2/ which is more than 60,000 tCO2e/yr. As per section 9.1.1 and 9.1.2 of GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/, the project is a large-scale GS VER project. Finally, CCIPL confirmed that there are no other similar projects in project area, furthermore, due to the project has unique identified GPS coordinates, thus there is no risk for the double counting and no overlap with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature.

	thresholds are defined as large scale. Small scale projects are defined in accordance with CDM project standard for project activities.	
	(d) Host Country Requirements Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) Projects shall be in compliance with applicable Host Country's legal, environmental, ecological and social regulations. Section 3.1.2 of *GS4GG Community Services Activity Requirements* (Version 1.2) Project Area and Boundary shall be defined in line with the applicable Impact Quantification Methodologies and Product Requirements. Section 3.1.1 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* Gold Standard VER Projects may be located in any host country or state. However, where host countries or states have mandatory operational schemes to reduce GHG emissions in any form (e.g., cap & trade, carbon tax etc.), Projects shall only be eligible if the Project Developer has either: (a) provided Gold Standard with satisfactory justification that no double counting of emission reductions occur or (b) has committed to retiring eligible units equal to the quantity of Gold Standard VERs. Refer to Annex A of this document.	Action Plan for Resource Utilization of Livestock manure" issued on 20/08/2017 by General Office of Ministry of Agriculture and Rural Affairs and Ministry of Ecology and Environment/77/, it is confirmed that the resource utilization of manure has been continuously promoted and standardized management has been achieved. While the project is to install new animal waste management systems by replacement of the current open anaerobic lagoons with new closed anaerobic digesters, which will treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. An Animal Manure Management System (AWMS) has been installed in each swine farm respectively which treat the manure and wastewater from the swine farm. The raw materials such as pig manure, urine and washing water are collected, and by a Upflow Anaerobic Sludge Bed Reactor (UASB), the biogas generated. biogas generated during the treatment process will be captured for hot water generation and the residual biogas will be flared. The fermented sludge from the aerobic composting system is used to produce organic fertilizer and wastewater will be treated aerobically and then supplied to the farmers living around free for agriculture irrigation which has been confirmed by site inspection and checking the Project Evaluation Report of the project/6/. Therefore, CCIPL confirmed that the project is in compliance with China's legal, environmental, ecological and social regulations. Furthermore, the Environment Impact Assessment (EIA)/7/ of the project has been approved by Environmental Protection Bureau of Xinmin City verified by checking the EIA approval dated on 30/03/2017/8/. Thus, it is concluded that the projects is in compliance with applicable Host Country's legal,

	environmental, ecological and social regulations and local government supported this project as described in the approval/8/. For the boundary and double counting, refer to above column for detail assessment.
(e) Contact Details Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) As part of the Project Documentation the Project Developer shall provide (i) name and (ii) contact details of all Project Participants; AND in case of an organization (iii) the legal registration details and (iv) documentation by the governing jurisdiction that proves that the entity is in good standing (defined as being a legal or other appropriate entity registered in or allowed to operate within the required jurisdiction and with no evidence of insolvency or legal/criminal notices placed against it or any of its Directors). Gold Standard retains the right (at its own discretion) to refuse use of the Standard where reputational concerns are highlighted.	The PP's name, contact details and legal registration details have been checked in the Appendix 2 of the PDD which verified as correct by comparing the business license of PP/5/. Furthermore, through checking the company information in National Enterprise Credit Information Publicity System/59/, CCIPL confirmed that PPs are in good standing and legally operated and allowed to operate within the required jurisdiction, the financial health is verified. And by checking the website, CCIPL confirmed that PPs never have no administrative discrimination information, not listed as business abnormal catalog information and serious illegal untrustworthy enterprise list (blacklist) information.
(f) Legal Ownership Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) Full and uncontested legal ownership of any Products that are generated under Gold Standard Certification, (for example carbon credits) shall be demonstrated. Where such ownership is transferred from project beneficiaries this must be demonstrated transparently and with full, prior and informed consent (FPIC). Note that for certain Project types there is a requirement for full and uncontested legal land title/tenure to be demonstrated. These are contained within specific Activity or Product Requirements. All projects shall immediately report to Gold Standard any land title/tenure disputes arising. Section 3.1.4 of *GS4GG Community Services Activity Requirements* (Version 1.2) Projects involving the distribution of a large number of devices for services such as heating, cooking, lighting, electricity generation, water treatment technology such as water filter, etc. shall provide a clear description of the ownership of the Products that are	The project was invested by Jintai Yangxiang. Henan Yangxiang (as the emission reduction carbon asset owner), who has full and uncontested legal ownership of the credits that will be generated under Gold Standard Certification. In addition, confirmation of the GS VER ownership has also been discussed during the local stakeholder consultation, which held on 31/01/2023. The same is confirmed from the on-site visit and emission reduction ownership/76/ Besides, the project is a retroactive project, hence, the PD discussed GS VER ownership with local stakeholders through live stakeholder consultation meeting held on 31/01/2023 which has been verified by checking the Stakeholder Consultation Report/3/.

	generated under Gold Standard Certification all along the investment chain. In line with the FPIC requirement, the proofs that end-users are aware of and willing to give up their rights on Products shall be provided. The transfer of Product ownership shall be discussed during local stakeholder consultations for projects.	
	(g) Other Rights Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2) As well as legal title and ownership, the Project Developer shall also demonstrate where required uncontested legal rights and/or permissions concerning changes in use of other resources required to service the Project (for example, access rights, water rights etc.). Any known disputes or contested rights must be declared immediately to Gold Standard by the Project Developer and resolved prior to further project implementation in affected areas.	Since the project is to install new animal waste management systems to swine farms located in Sunjiatun Village, Xinnongcun Township, Xinmin city, Liaoning Province, which will replace the current open anaerobic lagoons in baseline scenario with new closed anaerobic digesters, and via checking the Action Plan for Resource Utilization of Livestock manure" issued on (2017- 2020)/29/, it is confirmed that the project is in line with national regulations. Furthermore, via checking the provincial regulation "Opinions of the General Office of Liaoning Provincial People's Government on Accelerating the Utilization of Livestock and Poultry Breeding Wastes as resources"/31/, CCIPL confirmed that the project with utilization and resourceful treatment of the manure waste are encouraged by the local government. Besides, via checking the Licenses for production and operation of the breeding livestock and poultry/9 CCIPL verified that all the swine farms of the project have been approved by the local government which is confirmed as in line with the local regulations. And via site inspection, it is verified that all the manure from the swine farms have been put into the AWMSs as it is prohibited to discharge into any natural water resources without treatment by checking the Regulations on Prevention and Control of Pollution from Livestock and Poultry Farming/69/. In conclusion, the project does not involve any activity that causes alteration of any resource, or contested legal rights and other disputes, therefore the need for acquiring any specific legal right is not applicable.
	(h) Official Development Assistance (ODA) Declaration Section 3.1.1 of *GS4GG Principles & Requirements* (Version 1.2)	Via checking the ODA declaration signed by the project developer/24/, it is verified that no ODA is provided under the condition that the credits generated by the project will be

	All Project Developers applying for project activities located in a country named by the OECD Development Assistance Committee's ODA recipient list and seeking Gold Standard Certification for carbon credits shall declare the Official Development Assistance (ODA) support. The Project Developer shall follow the GHG Emissions Reduction & Sequestration Product Requirements and submit the declaration at the time of Design Certification. Section 6.1.1 and 6.1.2 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* Projects are ineligible for carbon crediting under Gold Standard if the ODA assistance is provided to the project under the condition that the credits generated by the Project will be transferred, either directly or indirectly, to the donor country providing ODA support. Project Developer submitting a Project located in a country named by the OECD Development Assistance Committee's ODA recipient list shall sign and submit the ODA Declaration.	transferred, either directly or indirectly, to the donor country providing ODA support.
	(i) Suppressed Demand Section 3.1.3 of *GS4GG Community Services Activity Requirements* (Version 1.2) Certain Impact Quantification methodologies allow projects to account Suppressed Demand scenario when establishing a baseline. In such cases, the application of Suppressed Demand baseline is limited to Small Scale and Microscale Projects. Where a Suppressed Demand baseline is applied, it is not possible to 'stack' Gold Standard Certified Impact Statements or Products as the definition of the baseline may be contradictory.	CCIPL confirmed that suppressed demand baseline is not applicable to the project. As per Section 3.1.3 of GS4GG Community Services Activity Requirements (Version 1.2), it can be a large-scale GS VER project.
	(j) Eligible Greenhouse Gases Section 4.1.1 of *GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.0)* Only Carbon Dioxide (CO_2), Methane (CH_4) and/or Nitrous Oxide (N_2O) are eligible for Gold Standard crediting, provided Projects comply with Gold Standard Requirements and eligibility criteria.	Via checking the PDD/1/, ER sheet/2/ and comparing with applied methodology/38/, CCIPL verified that project considers the emission reductions of Carbon Dioxide (CO_2), methane (CH_4) and/or Nitrous Oxide (N_2O) for Gold Standard crediting, thus is eligible for Gold Standard crediting.

The validation team therefore concluded project compliance with eligibility requirements in GS4GG Principles & Requirements document (version 1.2)/47/, GS4GG GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/ and GS4GG Community Services Activity Requirements (version 1.2)/49/, hence the project is eligible under GS4GG.

iii. Legal ownership of products generated by the project and legal rights to alteruse of resources required to service the project

Via checking the business license/5/, EIA/7/ of project owner (Xinmin Jintai Yangxiang Agriculture and Animal Husbandry Co., Ltd.) and PER of the project/6/, CCIPL confirmed that the project was invested by project owner Xinmin Jintai Yangxiang Agriculture and Animal Husbandry Co., Ltd. Henan Yangxiang has signed emission reduction authorization agreement with Jintai Yangxiang/81/, which stipulate the ownership of emission reduction and/or removal (ERRs) rights, in which the swine owner agree to transfer all legal rights of any ERR or greenhouse gas emission reduction to Henan Yangxiang Breeding Co., Ltd, including all rights to publish, forward and sell such ERRs as published units according to any applicable carbon standard. The same is confirmed from the emission reduction agreement/76/. Hence the Henan Yangxiang Breeding Co., Ltd, has full and uncontested legal ownership of the credits that will be generated under Gold Standard Certification.

Therefore, it is confirmed that the Henan Yangxiang Breeding Co., Ltd, has the legal ownership of the emission reductions generated by the project activity. This is verified by on site interview with the project owner, local officers and chief of swine farms and CCIPL confirmed that the legalownership of the project is uncontested.

In conclusion, CCIPL verified that the project does not involve any activity that causes alteration of any resource, or contested legal rights and other disputes, therefore the need for acquiring any specific legal right is not applicable.

iv. Location of project

The project is located in Sunjiatun Village, Xinnongcun Township, Xinmin city, Liaoning Province, China (42°13'25.60"N 122°51'52.39"E).

The project location has been clearly provided in section A.2 of the PDD and the detailed coordinates of the swine farm have been provided which have also been verified by site inspection with GPS device and the information is correct.

v. Technologies and/or measures

The information presented in the PDD on the technical design is consistent with the actual implementation of the project activity as confirmed through:

- Review of data and information in PER/6/, equipment purchase contracts/10/, General construction and installation contract/11/ and technical agreement of equipment/12/. This was verified with other sources if available.
- An on-site visit has been performed, new closed anaerobic digesters and main equipment have been observed and relevant operation personnel with knowledge of the project were interviewed. If doubts arose, further investigations and additional interviews were conducted.
- Finally, information related to the animal manure management system technologies in China have been used (if available) to confirm the accuracy and completeness of the project description.

The technology employed is environmentally safe and sound as well as state-of-the-art.

	The project start date is 21/12/2021 which has been confirmed by checking the equipment purchase contracts/10/ and was put into operation on 01/03/2022 which has been confirmed by checking the operation log of the project/13/ and record of operation started/16/. Basic technical details of the animal waste management systems are summarized in the table 2 of the PDD, refer to PDD for technical details. Technical data of main equipment have been listed and provided in the PDD, which have been verified by checking the nameplates of equipment taken during site visit/65/, equipment purchase contracts/10/ and technical agreements for equipment/12/ are used for cross-checking the above parameters and verified that the reasonable and correct values are listed in the PDD. ***vi. Scale of the project*** According to the section 9.1.2 of GHG Emissions Reduction & Sequestration Product Requirements (Version 2.1)/51/, the project introduces new animal waste management systems to treat the manure and wastewater, hence belongs to Type 3: other project activities, and via checking the ER calculation sheet/2/, CCIPL verified that the annual emission reductions of the project activity are 105,659 tCO_2e, which is more than 60,000 tCO_2e, thus is defined as a large-scale GS VER project. ***vii. Funding sources of project*** Via checking the business license/5/ of Project owner Xinmin Jintai Yangxiang Agriculture and Animal Husbandry Co. Ltd. and PER of the project/6/, it is verified that Project owner invested in all the finance of the project, there is no public funding involved. Via checking the ODA declaration/24/, it is verified that no ODA is provided under the condition that the credits generated by the project will be transferred, either directly orindirectly, to the donor country providing ODA support. Based on assessment above, CCIPL confirms that the description of the proposed CDM PA in the PDD is accurate and complete and it provides an understanding of the PA, and the project is in line with the applied methodology /38/ and GS4GG requirements /46//47/.

D.1.3. **Start date and duration of PA**

Means of validation	DR, I
Findings	No findings has been raised in this section.
Conclusion	As per the GS4GG clause 4.1.39 and 4.1.40 (principle and requirement) states '4.1.39 The Project start date is the earliest date on which the Project Developer has committed to expenditures related to the implementation of the Project. This does not include the purchase or option to purchase the land upon which a Project is intended to take place. Examples of the start date may include the date on which contracts have been signed for equipment or construction/operation services required for the Project. The start date of the project is 21/12/2021 which is the date on signing the Equipment purchase contract/10/. The assessment team has reviewed the Equipment purchase contract/10/ and found date is correct and this is the earliest date on which contracts have been signed for equipment or construction/operation services required for the Project confirmed in line with the start date definition in "Principles & Requirements (version 1.2)"/47/. The PD has considered a crediting period of 5 years renewable starting from 01/03/2022 or two years prior to the date of Project Design Certification, whichever is later. The lifetime of the project is defined as 15 years checked from the

	Technical Agreement/12/ of equipment as provided by PD and the details are found correct and consistent. The project was put into operation firstly on 12/08/2021 which has been confirmed by checking the operation log of the project/13/ and record of operation started of AWMS/16/. Based on the above assessment, the validation team concludes that the description and determination of the start date of the proposed PA is in conformance with the requirements of Validation and verification standard V1.0/80/ and GS4GG requirements /47/.

D.1.4. **Environmental impacts**

Means of validation	DR,I
Findings	No findings has been raise in this section
Conclusion	The project does not have any negative environmental impact and does not require any specific licence/approval from host country. Other positive environmental impacts are discussed in section D.3 below. Therefore, validation team confirms that the project does not result any negative environmental and social impact and meets the sustainable development criteria as defined by GS requirements.

D.1.5. **Local stakeholder consultation**

Means of validation	DR,I
Findings	No findings has been in this section
Conclusion	The local stakeholder consultation is conducted following guideline as outlined in GS4GG 'stakeholder consultation & Engagement procedure, requirement and guidelines and a stakeholder consultation report is prepared /15/. VVB cross checked the information provided in the stakeholder report during document review. The stakeholder meetings were held on 31/01/2023 at 102, 1st Floor, Office Building, Sunjiatun Village, Xinnongcun Township, Xinmin city, Shenyang City, Liaoning Province. The stakeholders were invited via emails, notice in public places and personal invitations/19/ and the documents were made available to the VVB. The same was also confirmed by stakeholders during site visit. All the steps found were performed as per the guideline. No negative comment or grievance was recorded during the stakeholder meeting. VVB also noted during the site visit that no negative comments from stakeholders from the project activity. It is also noted that a continuous grievance mechanism as detailed during stakeholder meetings is found in practice at site. Stakeholders are found aware of continuous grievance mechanism system. It is also noted from PP, the feedback round as required under the GS started immediately after the end of the stakeholder meeting and stakeholders were asked to provide feedback to the concerned personnel within 2 months after the stakeholder report is circulated. Email to relevant stakeholders along with the project documents are circulated on 20/12/2022. stakeholder feedback was from 24/12/2022 to 24/02/2023. However, until 24/02/2023 no comment received. Since a continuous grievance mechanism is in place the feedback round meets the GS4GG requirements. Validation team has checked the supportive document i.e., Minutes of LSC meeting, public invitation, personal invitations, Email to stakeholders, Attendance sheet, LSC evaluation forms and photos /15/ to confirm the LSC and found in line with the GS4GG STAKEHOLDER CONSULTATION AND ENGAGEMENT REQUIREMENTS/50/. Since the project is a retroactive project (Start date of the project is 10/06/2022), PP has conducted integrated stakeholder consultation and stakeholder feedback round as per the requirement of para 6.1.4 of GS4GG STAKEHOLDER

	CONSULTATION AND ENGAGEMENT REQUIREMENTS Version 2.1 which is found acceptable. An Email to relevant stakeholders along with the project documents is circulated on 20/12/2022. stakeholder feedback was from 24/12/2022 to 24/02/2023. However, until 24/02/2023 no comment received.

D.1.6. **Application of methodologies and standardized baselines**

Means of validation

The PDD employs the approved CDM methodology ACM0010 "GHG emission reductions from manure management systems (Version 08.0)"/38/.
The tools applied are listed as below,
Tool 02: Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)/39/
Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of power generation (Version 3.0)/40/
Tool 06: Project emissions from flaring (version 04.0)/41/
Tool 08: Tool to determine the mass flow of a greenhouse gas in a gaseous stream (version 03.0)/42/
Tool 14: Project and leakage emissions from anaerobic digesters (Version 02.0)/43/
Tool 24: Common practice (Version 03.1)/44/

Criteria ACM0010	**Characteristics of the project activity**	**VVB Justification**
This methodology applies to project activities that include destruction of methane emissions and displacement of a more GHG-intensive service in manure management of livestock farms by introducing a new animal waste management system or a combination of animal waste management systems that result in less GHG emissions.	This project introduces new AWMS to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The biogas generated during the treatment process will be captured for hot water generation and the residual biogas is flared.	The validation team has verified that this project activity is designed to treat the swine manure to produce the organic fertilizers through aerobic composting by site inspection and checking the PER/6/, related equipment purchase contracts/10/. Hence this criteria is applicable for this project activity.
This methodology is applicable to manure management on livestock farms where the existing anaerobic manure treatment system, within the project boundary, is replaced by one or a combination of more than one animal waste management systems (AWMS) that result in less GHG emissions compared to the existing system. The methodology is also applicable to Greenfield facilities.	The project activity will replace the current open anaerobic lagoons with a new AWMS. The part of biogas generated during the treatment process will be captured for hot water generation. After solid-liquid separation, the solid will be treated in aerobic composting system. The liquid will be treated through anaerobic digestion (UASB), the biogas generated during the treatment process will be captured for hot water generation and the residual biogas will be flared. The sludge produced from anaerobic digestion will be treated	The validation team has verified that this project activity project activity is installing of new animal waste management systems to treat the manure and wastewater from the swine farms to avoid methane emissions generated in the baseline uncovered anaerobic lagoons that result in less GHG emissions compared to the existing system PER/6/, equipment purchase contracts/10/. Hence this criterion is applicable for this project activity.

			through aerobic composting together with the solid and the effluent will be treated aerobically and then used for agriculture irrigation. The project activity will reduce of GHG in the atmosphere through avoiding methane emissions from anaerobic treatment of swine manure and wastewater.	
		This methodology is applicable to manure management projects under the following conditions: (a) Farms where livestock populations, comprising of cattle, buffalo, swine, sheep, goats, and/or poultry, is managed under confined conditions; (b) Farms where manure is not discharged into natural water resources (e.g., rivers or estuaries); (c) In case of anaerobic lagoons treatments systems, the depth of the lagoons used for manure management under the baseline scenario should be at least 1 m; (d) The annual average ambient temperature at the site where the anaerobic manure treatment facility in the baseline existed is higher than 5°C; (e) In the baseline case, the minimum retention time of manure waste in the anaerobic treatment system is greater than one month; (f) The AWMS(s) in the project case results in	(a) This project introduces new AWMS to a swine farm in Liaoning Province, which is operated by Xinmin Jintai Yangxiang Agriculture and Animal Husbandry Co. Ltd. Which is a large-scale private owned swine farm in which swine are managed under confined conditions. (b) A fully automatic scraper type manure cleaner is installed in the pig house to clean the manure in the pig house regularly. The remaining pig manure and urine in the pig house are flushed into the sewage pipe and finally collected in the catchment tank. The liquid will be treated through anaerobic digestion (UASB), the biogas generated during the treatment process will be captured for hot water generation and the residual biogas will be flared. The sludge produced from anaerobic digestion will be treated through aerobic composting together with the solid and the effluent will be treated aerobically and then used for agriculture irrigation. No swine manure will be dumped into any natural water resources. (c) The open anaerobic lagoons considered in the baseline scenario are	(a) The validation team has verified that this project activity is installing new animal waste management systems to treat the manure and wastewater from the swine farms to avoid methane emissions generated PER/6/, equipment purchase contracts/10/. project owner is one of the leading national leading agricultural enterprises with the largest scale of swine farming in China, all the livestock population in the swine farms within the project boundary is managed under confined conditions. (b) All the swine manure is dumped into open anaerobic lagoons and is not discharged into natural water resources. This is verified by checking the operation log of the breeding livestock and poultry/13/ and related “Regulations on Prevention and Control of Pollution from Livestock and Poultry Farming”/69/. (c) In the baseline scenario the depth of the open lagoons used for manure management under the baseline scenario is 3~5 meters higher than 1m. This is verified by checking the photo of baseline lagoon

	no leakage of manure waste into ground water, for example the lagoon should have a non-permeable layer at the lagoon bottom.	designed for deep storage and has a depth of 3-4 meters. (d) The annual lowest average ambient temperature at the site is 9.2°C [1], which is higher than 5°C. (e) As per the basic parameters of baseline anaerobic lagoon in each swine farm (the size of anaerobic lagoon in each swine farm are listed in section A.3), the minimum retention time of manure waster in the anaerobic treatment system can more than 45 days. (f) Seepage-proof UASB anaerobic digester applied in the project, which is impermeable. The construction of anaerobic tank is consistent with local standard of "Ministry of Environmental Protection Technical specifications of up-flow anaerobic sludge blanket(UASB)reactor for wastewater treatment".	and verified by checking the national standard "Design code for wastewater stabilization ponds (GJJ/T54-93)"/53/. (d) The annual average temperature of baseline site where anaerobic manure treatment facility is located is 9.8°C which is higher than 5°C. This is verified by checking the public information of local temperature/60/. (e) In the baseline scenario the retention time of manure waste in the anaerobic lagoons is not less than 45 days, This is verified by interview from the On-site visits. (f) The manure from the project will be utilized to produce fertilizer after methane capture, hence there is no leakage of manure waste into ground water occurred which is confirmed by site inspection and checking the produced fertilizer. Seepage-proof UASB anaerobic digester applied in the project, which is impermeable and will not cause leakage of manure waste into to ground water. Hence this criterion is applicable for this project activity
	In addition, the applicability conditions included in the tools referred to above apply	The tools involved in the proposed project include Tool 02, Tool 05, tool 06, tool 08, tool 14 and tool 24. The applicability analysis of the tools shown in the table below.	The validation team has verified that this project activity new AWMS to the swine farm to treat the swine manure to avoid methane emissions generated in the baseline uncovered anaerobic lagoon. project include Tool 02, Tool 05, tool 06, tool 08, tool 14 and tool 24. The applicability analysis of the tools shown in the table below.
	Applicability Criteria of	**Characteristics of the**	**VVB Justification**

[1] ln.cma.gov.cn/gswz/sy/xwzx_29641/qxyw/202301/t20230116_5262106.html

	Tool 2, Version 07.0	**project activity**	
	The tool is applicable to all types of proposed project activities. However, in some cases, methodologies referring to this tool may require adjustments or additional explanations as per the guidance in the respective methodologies. This could include, inter alia, a listing of relevant alternative scenarios that should be considered in Step 1, any relevant types of barriers other than those presented in this tool and guidance on how common practice should be established.	The project activity is designed to introduce new AWMS to swine farm to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. Alternative scenarios, barrier analysis, investment analysis and common practice analysis will be carried out based on Tool 02. Refer to section B.4 and B.5 of the PDD for more details.	The validation teamteam confirmed that the tool is applicable to all types of proposed project activities, and in section 15 of the applied methodology /38/, it requires project proponents determine the most plausible baseline scenario through the use of the "Combined tool to determine the baseline scenario and demonstrate additionality"/39/. Hence, this tool is applicable to the project.
	Applicability Criteria of Tool 5, Version 3.0	**Characteristics of the project activity**	**VVB Justification**
	If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption: (a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer; （b）Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power	All the electricity used by the project will be from will be supplied by Northeast China Power Grid2, which falls under scenario A of Tool 05 (Version 03.0). Therefore, emissions related to electricity consumption need to be calculated based on Tool 05.	Via site inspection, it is confirmed that the electricity consumption of the project will be supplied by the Northeast China Power Grid, which falls under scenario A. Therefore, emissions related to electricity consumption need to be calculated based on this tool.

[2] https://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/202012/t20201229_815386.shtml

	plant(s) is/are not connected to the electricity grid; or （ c ） Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.		
	This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated: （ a ） Scenario I: Electricity is supplied to the grid; （ b ） Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or （ c ） Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities	This methodological tool is applied for calculating emission by electricity consumption in project activity. So, this criterion is not applicable.	The project activity does not generate electricity. Since, the tool is applied for calculation of emission by consumption of electricity. This has been confirmed by site inspection and PER/6/. Hence, the criteria is not applicable
	This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for CO_2 emissions.	Tool 05 is only used to calculate project emissions of electricity consumption supplied by ECPG. For conservativeness, baseline emissions of captive biogas power generation system are ignored. Only CO_2 emissions will be accounted.	It is confirmed that this tool is only used to calculate project emissions of electricity consumption supplied by Northeast China Power Grid. Via checking the ER calculation process. For conservativeness, no renewable power generation technologies are installed to provide

			electricity in the project activity. Only CO_2 emissions will be accounted.
	Applicability Criteria of Tool 6, Version 4.0	**Characteristics of the project activity**	**VVB Justification**
	This tool provides procedures to calculate project emissions from flaring of a residual gas. The tool is applicable to enclosed or open flares and project participants should document in the CDM-PDD the type of flare used in the project activity.	The biogas generated during the treatment process will be captured for hot water generation and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas. Tool 06 is suitable for calculating the combustion emissions of biogas from the closed flare.	Biogas generated are captured for hot water generation for the swine farm and the residual biogas will be flared if there is any surplus biogas. They do not result in production of biogas. This has been confirmed by onsite inspections/65/. Hence this criterion is applicable.
	This tool is applicable to the flaring of flammable greenhouse gases where: （a）Methane is the component with the highest concentration in the flammable residual gas; and （b）The source of the residual gas is coal mine methane or a gas from a biogenic source (e.g. biogas, landfill gas or wastewater treatment gas).	The source of the residual biogas of the project activity is from anaerobic treatment process of the swine manure (biogenic source). As per Feasibility Study Report of the project, methane accounts for 60% of the biogas, which is the highest concentration in the flammable residual gas.	The validation team confirms that Methane accounts for majority of the biogas by evaluating the PER/6/. Hence this tool is applicable.
	The tool is not applicable to the use of auxiliary fuels and therefore the residual gas must have sufficient flammable gas present to sustain combustion. For the case of an enclosed flare, there shall be operating specifications provided by the manufacturer of the flare.	No auxiliary fuels will be used by the flaring system. As per Feasibility Study Report of the project, methane accounts for 60% of the biogas. And methane is a kind of flammable gas. Operating specifications were provided by the manufacturer of the flare. The flare used in the proposed project is a closed flare, and manufacture specification of the flare as follow:	Validation team confirmed that the flaring system will not use auxiliary fuels. Methane accounts for 60% of biogas. And methane is a kind of flammable gas. This has been confirmed by PER/6/ and onsite visit/ 65/. Hence this criterion is not applicable.

		Model[3]	Operating temperature	Flow rate[4]
		M hj-300 m^3	600~1000°C	60~300 m^3/h (61~336 Nm^3/h)
Criteria Tool 08, (version03.0)		**Characteristics of the project activity**		**VVB Justification**
Typical applications of this tool are methodologies where the flow and composition of residual or flared gases or exhaust gases are measured for the determination of baseline or project emissions.		The amount of biogas produced from anaerobic digestion will be collected and monitored. Refer to section B.7 of the PDD for more details.		The VVB confirmed the amount of biogas collected at the digester will be collected and monitored. Hence, this criterion is applicable for this project activity by site inspection and checking the PER/6/.
Methodologies where CO_2 is the particular and only gas of interest should continue to adopt material balances as the means of flow determination and may not adopt this tool as material balances are the cost-effective way of monitoring flow of CO_2.		The biogas generated during the treatment process includes CH_4, H_2S、O_2, CO, CO_2, N_2 and H_2, of which CH_4 is the main component. Therefore, this tool is adopted used for determining the mass flow of a greenhouse gas.		It is confirmed that the biogas generated during the treatment process contains CH_4, H_2S、O_2, CO, CO_2, N_2 and H_2, etc., hence the tool is used for determining the mass flow of a greenhouse gas. Hence this criteria is applicable for this project activity which has been confirmed during site visit
The underlying methodology should specify: (a) The gaseous stream the tool should be applied to. (b) For which greenhouse gases the mass flow should be determined. (c) In which time intervals the flow of the gaseous stream should be measured; and Situations where the simplification offered for		a) Methodological tool" Tool to determine the mass flow of a greenhouse gas in a gaseous stream" is applied in the PDD. b) The mass flow of CH_4 is determined in the monitoring plan of the PDD. c) The flow of the gaseous stream will be measured continuously. The gaseous stream is dry, equation (5) and (6)		(a) The tool is confirmed applied in the PDD. (b) The mass flow has been determined in the monitoring plan of the PDD. (c) The flow of the gaseous stream will be measured continuously as determined in the monitoring plan of the PDD. (d) The gaseous stream is dry and related equations have been used to calculate the mass flow of greenhouse gas. Hence this criteria is

[3] The flare model is determined according to GB/T 41191-2021, the initial letter "M" stands for enclosed flare, and "K" stands for open flare.< https://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=35315FF8CC05EB261123E10783AB62A1 >

[4] The adjustment ratio of the combustion volume of the biogas flare adopts the 5:1 provided by GB/T 41191-2021, that is, the maximum flow: the minimum flow = 5:1.

	calculating the molecular mass of the gaseous stream (equations (3) or (17) is not valid (such as the gaseous stream is predominantly composed of a gas other than N2).	are used to calculate the mass flow of greenhouse gas.	applicable for this project activity.
	Criteria Tool 14 (Version 02.0)	**Characteristics of the project activity**	**VVB Justification**
	The following sources of project emissions are accounted for in this tool: （a）CO_2 emissions from consumption of electricity associated with the operation of the anaerobic digester; （b）CO_2 emissions from consumption of fossil fuels associated with the operation of the anaerobic digester; （c） CH_4 emissions from the digester (emissions during maintenance of the digester, physical leaks through the roof and side walls, and release through safety valves due to excess pressure in the digester); and （d） CH_4 emissions from flaring of biogas.	Electricity will be used during the operation of the anaerobic digester, and the anaerobic digestion process of this project does not involve the use of fossil fuels. In case of missing data due to meter failure or other reasons for a certain period of time, the following options to estimate electricity consumption may be applied: A conservative value based on rated capacity and full operational hours (8760 hours). Meanwhile the biogas is used as boiler fuel to produce hot water for the swine farm and the residual biogas will be flared if there is any surplus biogas. So, the project meets the (a) (c) and (d).	The VVB confirmed that the electricity will be used during the anaerobic digester and biogas generated through the treatment process will be used as boiler to produce hot water and excess gas will be flared. Hence this criterion is applicable for this project activity and confirmed by site inspection /65/ and checking the PER/6/.
	The following sources of leakage emissions are accounted for in this tool: （a） CH_4 and N_2O emission from composting of digestate; （b） CH_4 emissions from the anaerobic decay of digestate disposed in a SWDS or subjected to anaerobic storage, such as in a stabilization pond.	After anaerobic digestion, the sludge produced from anaerobic digestion will be treated through aerobic composting together with the solid. In this project, there is no additional storage yard to store the sludge produced from anaerobic digestion. Therefore, the leakage emissions associated with the anaerobic digester ($LEAD$,) should not be taken into account for this project.	The project activity replaces open anaerobic lagoons with new closed UASB anaerobic digesters and biogas generated during the treatment process will be captured by boiler as fuel and excess is flared. So, leakage emissions are not considered. This can be confirmed from site inspection /65/ and PER /6/

Emission sources associated with N_2O emissions from physical leakages from the digester, transportation of feed material and digestate or any other on-site transportation, piped distribution of the biogas, aerobic treatment of liquid digestate and land application of the digestate are neglected because these are minor emission sources or because they are accounted in the methodologies referring to this tool.	Emission sources associated with N_2O emissions from physical leakages from the digester, transportation of feed material and digestate or any other on-site transportation, piped distribution of the biogas, aerobic treatment of liquid digestate and land application of the digestate are neglected because these are minor emission sources.	The emission sources are minor since, physical leakages from digester, any other digestate and was be confirmed from site inspection and PER /06/.
Applicability Criteria of Tool 24,Version 03.1	**Characteristics of the project activity**	**VVB Justification**
This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	Combined tool to identify the baseline scenario and demonstrate additionality (Version07.0) is applied to identify the baseline scenario by the project.	As assessed above, the project applies the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" for the demonstration of additionality, the project can use the common practice test for the demonstration of additionality. Hence this criterion is applicable for this project activity.
In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	It is consistent of Tool 24 (Version 03.1) and ACM0010 (Version 8.0) on approaches for the conduction of the common practice test.	The validation team confirmed that the methodology defines approaches for the conduction of the common practice test that are same to those described in this methodological tool /44/. Hence this criteria is applicable for this project activity

Findings	CAR 04 was raised in this regard and successfully resolved. Please refer appendix 4 for details
Conclusion	CCIPL hereby confirms that the selected baseline and monitoring methodology has been approved by Gold standard, and is applicable to the Project, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed project activity.

D.1.7. **Deviation from methodology and/or methodological tool**

Means of validation	No deviation from the applied methodology or methodological tool is applied in the project activity.
Findings	N/A
Conclusion	N/A

D.1.8. **Clarification on applicability of methodology, tool and/or standardized baseline**

Means of validation	No clarification on the applied methodology or methodological tool is applied in the project activity
Findings	N/A
Conclusion	N/A

D.1.9. **Project boundary, sources and GHGs**

Means of validation	The project boundary basically defines the physical and geographical boundary of the project facility, and it is well defined in the PDD/1/ (section B.3) according to ACM0010 GHG emission reductions from manure management systems (Version 08.0)/38/. Project boundary has been defined in the PDD according to the applied methodology ACM0010/38/ as the geographical extent of the project boundary includes the site of the AWMS(s), including the flare and heat generation source and considers the GHG emissions that come from AWMSs, including the GHGs emissions from the anaerobic digestion, GHG emissions from sludge treatment by aerobic composting and GHG emissions from flaring system swine farms which is verified by checking the PER of the project/6/ and on-site inspection.
Findings	No findings has been in this section
Conclusion	The project boundary confirmed during the on-site visit along with the documentary evidence was found in conformance with the applied baseline methodology. All sources of GHG emissions required by the methodology have been included in the project boundary and are justified in reference to the project activity. It is concluded that the project boundary and selected sources are in accordance with the requirements of the applied methodology and are correctly justified for the project.

D.1.9.1.Baseline scenario

Means of validation	DR, I
Findings	CAR 05 has been raised in this regard and successfully resolved. Please refer appendix 4 for details
Conclusion	The PP has applied an approved baseline and methodology ACM0010 “GHG emission reductions from manure management systems” (version 08.0) which are approved under CDM scheme. As per the applied methodologies, the baseline scenario has been determined as: in the absence of the project activity, biomass, and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere. CO_2 emissions from the decomposition of organic waste are not accounted in

	baseline. CH_4 is the major source of emissions in the baseline. Validation team confirms that the baseline scenario is identified as per the applied methodology. All data parameters are used correctly while estimating the baseline emissions. The baseline scenario represents the most possible scenario in absence of the project activity. The same is also justified in section B.4 of PDD. The same was confirmed during the onsite interviews with the local stakeholders and government official /65/.

D.2.1. Demonstration of additionality

Means of validation	DR,I
Findings	CAR 02, CL 03 and CL 06 has been raised in this regard and successfully resolved. Please refer appendix 4 for details
Conclusion	The PDD applies the stepwise approach as given by section 5.2 of the ACM0010/38/ and "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 07.0)/39/. **Step 1: Identification of alternative to the project activity consistent with current laws and regulations** **Step 1a: Define alternative scenarios to the project activity.** Before to the project's installation, all manure waste generated by the livestock farms' existing swine farms was allowed to decay in open anaerobic lagoons, and methane was released into the atmosphere without the use of any methane recovery or destruction facilities., hence according to the applied methodology, for existing facilities, for the baseline alternatives for managing the manure, PP has listed the complete set of existing/possible manure management systems listed in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4, Chapter 10, Table 10.17) and possible combinations of animal manure management systems have been taken into account. No further scenario is considered reasonable under the given context. The alternatives are assessed by validation team as below.

IPCC Alternatives	Validation team Assessment
The manure is collected from the pasture/Range/Paddock	Via site inspection, CCIPL confirmed that swine in this project are bred in confined barns rather than pasture/range/paddock. This alternative is ruled out.
Daily spread: Manure removed from confinement and applied to pasture within 24 hours of excretion	Via site interview with chief and staffs in swine farms, CCIPL confirmed that it is not possible to remove the manure and apply on a daily basis for such large-scale swine farms, hence this alternative is not economically attractive. This alternative is ruled out.

		Solid Storage: The manure is disposed by solid storage.	Via site interview with chief and staffs in swine farms, CCIPL confirmed that solid storage is a storage method of manure, not a disposal method, and not suitable for such large-scale swine farms for using of a scraping and flushing approach to remove manure which has large volumes of water, hence this alternative is not economically attractive. This alternative is ruled out
		Dry lot	Via site interview with chief and staffs in swine farms, CCIPL confirmed that dry lot is a storage method of manure, not a disposal method, and not suitable for such large-scale swine farms, In dry climates animals may be kept on unpaved feedlots where the manure is allowed to dry until it is periodically removed This method can only reduce the moisture content of manure, it is only a way of storing manure, and it does not perform resourceful and harmless treatment of manure hence this alternative is not economically attractive. This alternative is ruled out.
		The manure is disposed as liquid/slurry.	Via site interview with chief and staffs in swine farms, CCIPL confirmed that this method is a storage method of manure, not a disposal method, Manure is stored as excreted or with some minimal addition of water in either tanks or earthen ponds outside the animal housing, usually for periods less than one year. Since the amount of discharged manure is very large even on a daily bases, storing the liquid manure in the tank to distribute them to the farmland requires a lot of labor work and not suitable for such large-scale swine farms, hence this alternative is not economically attractive. This alternative is ruled out
		Uncovered anaerobic lagoon	Via site interview with chief and staffs in swine farms and by checking the photo of baseline lagoon/65/, CCIPL confirmed that this is the scenario prior to the project implementation and it is a kind of harmless treatment of manure as per the “Technical specification for sanitation treatment of livestock and poultry manure”/67/ which means the animal waste that has been treated by uncovered

		anaerobic lagoon can satisfy the above regulations. So, the uncovered anaerobic lagoon is an alternative baseline scenario
	Pit storage below animal confinements, <1month	Via site interview with chief and staffs in swine farms, CCIPL confirmed that this method is a storage method of manure, not a disposal method, and not suitable for such large-scale swine farms which need a lot of labour work, hence this alternative is not economically attractive. This alternative is ruled out.
	Pit storage below animal confinements, > 1month	Via site interview with chief and staffs in swine farms, CCIPL confirmed that this method is a storage method of manure, not a disposal method, and not suitable for such large-scale swine farms and long-time storage will generate the toxic fumes which may kill the pigs, hence this alternative is not realistic. This alternative is ruled out.
	Anaerobic digester (Anaerobic digester-Aerobic Treatment system)	This is part of the project scenario, due to a single anaerobic process is not yet able to meet the requirements for the use of the waste and must be followed up with disposal, which requires the use of a combination of aerobic and anaerobic processes together, this method is confirmed as one of the most advanced manure managements systems, but need high investment. This alternative is realistic for this step
	Burned for fuel	Via site interview with chief and staffs in swine farms, CCIPL confirmed that this method is not suitable for such large-scale swine farms that generate too much dung and urine daily, which hard to dry and burned for fuel. This alternative is ruled out.

		Cattle and Swine deep Bedding, <1month Cattle and Swine deep Bedding, >1month	Via site interview with chief and staffs in swine farms, CIPL confirmed that this method is a storage method of manure, not a disposal method, and not suitable for such large-scale swine farms as deep bedding is counter to achieving economies of scale associated with large animal counts, hence this alternative is not realistic. This alternative is ruled out.
		Composting - In-vessel	Via site inspection, CCIPL confirmed that the manure in this project is in liquid with large volume of water, hence this alternative is not realistic. This alternative is ruled out.
		Composting - Static pile	Via site inspection, CCIPL confirmed that the manure in this project is in liquid with large volume of water will consume a great deal of electricity for forced aeration as the large quantity of swine manure, hence this alternative is not economically attractive. This alternative is ruled out
		Composting - Intensive windrow	Via site inspection, CCIPL confirmed that the manure in this project is in liquid with large volume of water will consume a great deal of electricity for forced aeration as the large quantity of swine manure, hence this alternative is not economically attractive. This alternative is ruled out.
		Composting - Passive windrow	Via site inspection, CCIPL confirmed that this method would take a long time and occupies a large area of land, even emits strong odours and GHGs during turning, hence this alternative is not economically attractive. This alternative is ruled out.
		Poultry manure with litter	Via site inspection, CCIPL confirmed that only large-scale swine farm involved in the project, no Poultry farm.
		Poultry manure without litter	Via site inspection, CCIPL confirmed that only large-scale swine farm involved in the project, no Poultry farm.

Aerobic treatment (Anaerobic Digester-Aerobic Treatment system)	Via site inspection, CCIPL confirmed that single aerobic treatment technique is not suitable for treating low concentration organic wastewater in wastewater. At present a combine Anaerobic Digester-Aerobic Treatment system is considered as one of the most advanced manure management systems, but to implement such technology need high invest and the proposed project will not be invested and constructed without being registered as a GS project which has been demonstrated in the below step 3. Hence this alternative is not economically attractive. This alternative is ruled out.

Hence, based on above assessment, CCIPL confirmed that the remaining realistic and credible alternative scenarios for the new animal waste management system are.

Scenario 6: "The manure is disposed in an uncovered anaerobic lagoon".

Scenario 8&17: "Anaerobic Digester-Aerobic Treatment i.e., the proposed project activity not being registered as a VCS project activity".

Step 1b: Consistency with mandatory applicable laws and regulations

Via searching the public website with laws and regulations in Liaoning Province and China by CCIPL/61//62//63//64//66//69/, it is confirmed that there is no legal law and regulation to mandate the livestock farm owners to implement anaerobic digestion, aerobic or other biological treatment techniques to treat the animal manure in China. And via checking the "Regulations on Prevention and Control of Pollution from Livestock and Poultry Farming"/69/ and "Technical specification for sanitation treatment of livestock and poultry manure"/67/, CCIPL confirmed that the manure is prohibited to discharge directly into environment without any treatment and the uncovered anaerobic lagoon is a kind of manure treatment method recognized by the state. Besides, the "Specifications for the construction of manure resource utilization facilities for large-scale livestock and poultry farms (for trial implementation)"/66/ has been checked and CCIPL confirmed that anaerobic digester, aerobic treatment or other biological treatment techniques methods to dispose manure waste are encouraged by the state and not mandatory.

As assessed above, CCIPL confirmed that the above options of Scenario 6 and Scenario 8&17 are considered to follow all mandatory applicable legal and regulatory requirements which are verified based in validation team's local expertise. The outcome of Step 1b is same to Step 1a.

Step 2: Barrier analysis

Based on above assessments, it is concluded that both the two alternatives have no

	technology barriers, acceptability barriers and financial barriers. Therefore, both alternatives come to Step 3 Step 3: Investment analysis The purpose of this step is to determine which one is economic attractive. For each alternative, all cost and economic benefits attributable to the waste management scenario should be illustrated in a transparent and complete manner according to the Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)/39/. Via checking the calculation formula and calculation process of the value of IRR and NPV in the calculation sheet/4/, CCIPL confirmed that the formula and inputs values are correct and actual by checking the PER/6/and Economic Evaluation Method and Parameter of Construction Projects version 03/54/, thus CCIPL verified that the calculation results of the NPV for scenario 6 and scenario 8&17 are correct. By comparing with the results, CCIPL confirmed that the NPV of the project activity is far more negative than that of the uncovered anaerobic lagoon. Hence the uncovered anaerobic lagoon is the most attractive course of action and is considered to be the baseline scenario. Furthermore, for the project scenario, PP has analysed the IRR value to prove that only revenues from VCUs, the IRR/4/ of the project activity is higher than the benchmark. While checking the calculation formula and calculation process of the value of IRR in the calculation sheet/4/, CCIPL confirmed that the formula and inputs values are correct and actual by checking the PER/6/ and Economic Evaluation Method and Parameter of Construction Projects version 03/54/. The input values used in investment analysis the construction investment confirmed as sourced from Project evaluation report/6/ and by checking the EPC contract/10/. Hence, VVB verified that the time interval between the project evaluation report complete date and the investment decision date is less than 1 year, therefore input values are valid and applicable at the time of the investment decision. CCIPL verified that There are no potential revenues involved in the baseline scenario. There are only negative flows in the baseline scenario and the final value of IRR of the project scenario without carbon revenue is undefined. Benchmark of 9.5% is confirmed as reasonable by checking the “Notice on adjusting financial benchmark rate of return of construction projects in some industries” issued by NDRC and the ministry of housing and urban-rural development of PRC on 15-March-2013/63/, which define the financial benchmark of animal industry for Project IRR (after tax) is 9.5% for total investment. And via further searching the information of the document and based on the local expertise, VVB confirmed that this is the latest available document, and the issued date is earlier than the date of investment decision. Therefore, the applied benchmark in the investment analysis for the project is verified as reasonable.

	PP has selected the Tool 2, the alternatives that don't face any barriers for demonstration of additionality. The manure treatment system of the project uses a combination of aerobic and anaerobic processes to treat animal manure. Compared with the baseline scenario, it requires more investment and higher operating costs, but this does not generate any additional benefits. There are no potential revenues involved in this project and only negative flows in this project. So, the Internal Rate of Return (IRR) cannot be calculated, and the economic comparison should be based on the Net Present Value (NPV) indicator. The organic fertilizer produced by composting is given to the surrounding villagers for free, and no income can be obtained through the sale of organic fertilizer. VVB during its onsite visit/08/, discussion with local experts, interviews with the PP and Local stakeholders, it has been confirmed that, there is no legal requirement in China that requires the collection and destruction of methane from livestock manure. The PP has invested in the project and there is no revenue with respect to the investment made through the proposed project activity as the organic fertilizer produced from the project activity is distributed free to the farmers. The same is confirmed during the onsite visit/65/. And by checking the calculation process of the value of IRR in the calculation sheet/4/, CCIPL confirmed that the value of IRR of the project scenario with carbon revenue is increased to 12.30% which is higher than the benchmark of 9.5% and thus the proposed project is financially acceptable with carbon revenue. This project activity does not generate any additional benefits, because the organic fertilizer produced from the project activity, will be given to surrounding farmers for free /23//65/. The same is confirmed during the onsite interviews with the nearby farmers/65/, VVB has also verified the announcement document circulated w.r.t. the free distribution of the organic fertilizers/23//65/. Further, VVB has checked the registration document for the free distribution of organic fertilizers/65//23/. This project has no other potential income. There are only negative flows in this project, so the Internal Rate of Return (IRR) cannot be calculated, and the economic comparison should be based on the Net Present Value (NPV) indicator. Further, PP has demonstrated the barrier related to existing rules and regulations in the host country. In the host county China, it doesn't require the collection and destruction of methane from livestock manure/65/ /18/ /64/ /68/. Therefore, all manure waste produced was left to decay in uncovered anaerobic lagoons, which is the most economic, viable, and reasonable for livestock farm owners, and methane would be emitted into the atmosphere in this treatment. So, the users have limited access to this to absorb the new technologies. Though it is a green field project activity, as mentioned above there is no regulatory requirement to collect and destruct methane and to process the livestock manure which makes the project automatically additional. Also, since the project does not generate any potential income, therefore an extra revenue is required to make the project viable. CCIPL during its onsite visit/65/, discussion with local experts, interviews with the PP and Local stakeholders, it has been confirmed that, there is no legal requirement in

China that requires the collection and destruction of methane from livestock manure. The PP has invested in the project and there is no revenue with respect to the investment made through the proposed project activity as the organic fertilizer produced from the project activity is distributed free to the farmers. The same is confirmed during the onsite visit/65/.

A sensitivity analysis has been provided in the PD and the calculation sheet/4/. The analysis is assessed as follow,

The sensitivity analysis was demonstrated through two manners:

a) Varying ± 10 % of three critical parameters (total static investment, O&M cost and Methane production). The selection is checked as in line with the requirements in Tool of Investment analysis (version 11.0)/45/

Via checking the sensitivity analysis for these three critical parameters as provided in PDD and the calculation sheet/4/, CCIPL verified that the IRR values are still lower than the benchmark by varying ±10% of three critical parameters.

b) Threshold analysis by varying the above three parameters to make the IRR reach the benchmark. The threshold analysis of each parameter is assessed individually by the validation team as below,

i. According to the equipment and civil construction contracts/10/11/, the static investment of the first phase of the project is 2.53 million yuan, it is impossible to bring the IRR to the industry benchmark. Therefore, the data used in the investment analysis are believed to be reliable and credible. The operation and maintenance cost of the project is mainly the cost incurred during the operation of sewage treatment, which is greater than the fuel purchase cost saved by the methane generated by the project. Even if the asset investment is 0, the net cash flow of the project is still not negative, and the IRR value cannot be calculated. ii. If the Methane production increases by 81.63%, the IRR reach the benchmark, however, via checking the PER/6/, CCIPL confirmed that the organic fertilizers are determined by by the amount of manure produced by the pigs on the farm. The more manure produced by the farm, the more methane produced by the anaerobic unit. Due to the limitation of the size of the pig house and the number of stalls, the number of pigs stored in Jintai Yangxiang at full production cannot exceed 48,000, so the methane production of the anaerobic unit cannot increase by 81.63%.. besides, The organic fertilizers produced by the project is given to nearby farmers for free. According to the current operation scale, the average annual methane production is about 480t, and after the project is fully completed, the average annual methane production is about 1440 tons, and the methane production cannot be increased by 81.63%.Hence it is not likely to increase of Reduce fuel cost revenue by 81.63% to make the IRR reach the benchmark.

iii. If the O&M Costs decrease by 50.58%, the IRR reach the benchmark, however, via checking the PER/6/ and O&M contract/79/, CCIPL confirmed that O&M costs mainly consist of maintenance cost, salary & welfare,

insurance of fixed assets, and other cost. Via checking the average monthly wage level in Liaoning Province/71/, At present, the first phase of the Jintai Swine Farm (16,000 fattening swine stored) has been put into operation. According to the actual operation of the project, the annual O&M cost is 650,000 RMB. When the project is fully produced (48,000 fattening swine stored), the annual O&M cost will reach 1.95 million RMB. CCIPL confirmed that the average monthly wage keeps increasing in past years. Besides, via checking the indices of purchasing price of raw material, power and fuel/62/, CCIPL confirmed that the price index was rising in the past years. Therefore, it is not likely to implement the project activity with the O&M cost reducing by 50.58% to make the IRR reach the benchmark.

In conclusion, the investment analysis concludes that the project IRR (after tax) will not reach the benchmark of 9.5% and the project activity is unlikely to be financially attractive. Threshold analysis further proved this. The sensitivity analysis and threshold analysis were reproduced by the validation team and evaluated to be correct. Based above, it can confirm that the financial unattractiveness of the project is robust and thus the scenario 6 is the most economically attractive option and plausible baseline scenario. The NPV of both the project activity (sscenario NO.8& NO.17)without VCUs revenues and the uncovered anaerobic lagoon(sceanario NO.6,which is the baseline scenario.) are negative and the NPV of the project activity without VCUs revenues is far more negative than that of the uncovered anaerobic lagoon which means the cost of the project activity without VCUs revenues is much higher than the uncovered anaerobic lagoon, so the uncovered anaerobic lagoon is the most attractive course of action and is considered to be the baseline scenario.

Hence the scenario 6 is considered as baseline scenario which is “The manure is disposed in an uncovered anaerobic lagoon”.

Based on the checking the data provided in PDD and above related assessment, it proves that the baseline scenario determined in the Joint-PD-MR is correct and reasonable. Therefore, baseline scenario is identified transparently for the project activity.

The assessment team has reviewed the *PDD* in line with the applied methodology and methodological tool and CCIPL confirmed that PP has correctly identified the baseline scenario.

Step 4 Common practice analysis

The common practice analysis was checked strictly following Methodological tool “Common practice” (Version 03.1)/44/.

Step 1: calculate applicable capacity or output range as +/-50% of the design capacity or output of the proposed project activity.

The project activity is to treat the manure from the swine farms, swine farms involving, 48,000 heads of breeding swine in stock are included, and are estimated to produce 70,319 tons of manure every year. So the range is the projects handle manure from 35,259 tons to 105,578 tons are considered as similar projects.

Step 2: identify similar projects (both CDM and non-CDM) which fulfill all of the following conditions:

a) The projects are located in the applicable geographical area,

b) The projects apply the same measure as the proposed project activity,

c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity,

d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g., clinker) as the proposed project plant,

e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1,

f) The projects started commercial operation before the project design document is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Demonstration as follow,

a) The region selected for common practice of Liaoning province is considered to be a geographical area with comparable investment climate and is selected for geographical boundaries of common practice analysis.

b) Same measures is defined as: Methane formation avoidance

c) Same energy source/fuel and feedstock: The biogas captured for hot water generation for swine farm.

d) Treat manure waste and produce, Hot water from captured biogas.

e) Output range: handle manure from 35,259 tons to 105,578 tons annually.

f) Commercial operation started before 21/12/2021.

Thus, the Swine Farm Animal Manure Management System GHG Mitigation projects operated before 21/12/2021, handle manure from 35,259 tons to 105,578 tons annually with delivery heat in Liaoning province are determined similar projects.

The information source from local DRC of Liaoning province website/63/ and other public information from Department of Agriculture and Rural affairs of Liaoning Province/66/for the common practice analysis is available and checked by the audit team. The information used is evaluated to be credible.

Via the source, CCIPL confirmed that there is one similar project identified in Liaoning Province based on the above criteria. i.e., VCS project which is submitted for request for registration as below:

Project name	**Reference number**
Xinfeng AWMS GHG Mitigation Project in Liaoning province	VCS 3880

Step 3: within the projects identified in Step 2, identify those that are neither

	registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number Nall. There are no similar projects identified in Liaoning Province. Hence Nall=0. **Step 4: within similar projects identified in Step 3, identify those that are different to the technology applied in the proposed project activity. Note their number Ndiff.** Due to Nall=0, Nall=Ndiff=0. Step 5: calculate factor F=1-Ndiff/Nall representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity. For this project, F=1- Ndiff/Nall =1-0=1 and Nall-Ndiff=0. Therefore, the result of common practice assessment is: Nall-Ndiff=0<3 AND F=1-Ndiff/Nall=1-0=1<0.2. In conclusion, Nall-Ndiff is not greater than 3. hence, the project meets the criteria and tool "Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)"/39/, thus deemed as additional.

D.3. Safeguarding Principles Assessment

Means of validation	PP has done the safeguarding principles assessment analysis and presented assessment in the GS PDD /01/. The assessment has been performed in accordance with requirements prescribed in the GS4GG Principles & Requirements, Version 1.2 & Safeguarding Principles & Requirements, Version 1.2. The detailed assessment of safeguarding principle is provided in Appendix 5 below:
Findings	No findings in this section
Conclusion	Validation team has carried out on site interviews to cross check the safeguarding principle assessment conducted by the PP. GS VVB has also reviewed the initial GS local stakeholder consultation report/19/ and GS4GG PDD /01/ and found that the PP has assessed all the required critical safeguarding principle in project activity. It has been found that the PA fulfils all the principles like Human Rights, Labor standards, environment protection, and anti-corruption. Validation assessment has been provided in the below Appendix 5.

D.4.Estimation of emission reductions or net anthropogenic removals

Means of validation	For validation of the estimated GHG emission reductions in the PDD/1/ and ER calculation sheet/2/, Further, the VVB has downloaded from the UNFCCC website the applicable version of the CDM methodology, Via verify the PDD/1/, it is confirmed the calculation of ERs is done as per the applied methodology (ACM0010 ver. 08.0) with follow steps listed below.

Baseline emissions

calculated as:

$$BE_y = BE_{CH4,y} + BE_{N2O,y} + BE_{elec/heat,y}$$

(Equation 1 ACM0010,V08.0, Equation 1)

Where:

BE_y	Baseline emissions in year y (t CO_2/yr)
$BECH_{4,y}$	Baseline CH_4 emissions in year y (t CO_2/yr)
$BEN_2O_{,y}$	Baseline N_2O emissions in year y (t CO_2/yr)
$BE_{elec/heat,y}$	Baseline CO_2 emissions from electricity and/or heat used in the baseline (t CO_2/yr)

1. Baseline CH4 emissions (BECH4, y)

$$BE_{CH4,y} = GWP_{CH4} * D_{CH4} * \sum_{j,LT}(MCF_j * B_{0,LT} * N_{LT} * VS_{LT,y} * MS\%_{Bl,j})$$

(Equation 2 ACM0010,V08.0, Equation 2)

Where:

$BECH_4$, y = Baseline CH_4 emissions in year y (t CO_2/yr)

$GWPCH_4$ = Global Warming Potential (GWP) of CH_4 (t CO_2e/t CH_4)

D_{CH4} = Density of CH_4 (t/m^3). 0.00067t/m^3 at room temperature(20℃) and 1atm pressure.

MCFj = Annual methane conversion factor (MCF) for the baseline AWMSj. IPCC 2006 Guidance,table 10.17, chapter 10, volume 4.

B0,LT = Maximum methane producing potential of the volatile solid generated by animal type LT (m^3CH_4/kg -dm)

NLT = Annual average number of animals of type LT for the year y (number)

VSLT,y = Annual volatile solid excretions for livestock LT entering all AWMS on a dry matter weightbasis (kg -dm/animal/yr)

MS%Bl,j = Fraction of manure handled in system j in the baseline. In this project, the baseline manure management system is uncovered anaerobic lagoon only. The amount of manure handled by the anaerobic lagoon is 100%. MS%Bl,j =100%

LT = Type of livestock

j = Type of treatment system

Estimation of various variables and parameters for above equation:

$VS_{LT,y}$

As per the methodology, there are four options to determine this value, via

checking the options provided, CCIPL confirmed there is no published country specific data available based with the local expertise of audit team. There is no published country specific data available, so we could not use Option 1. The energy intake of the swine is not available, Option 2 can't be used. Option 3 utilizes the average weight of the swine, this data is available and therefore Option 3 is adopted by PP to calculate VSLT,y.

Scaling default IPCC values VSdefault to adjust for a site-specific average animal weight as shown in equation below: $VS_{LT,y} = \left(\frac{W_{site}}{W_{default}} \right) \times VS_{default} \times nd_y$

(Equation 4- ACM0010,V08.0, Equation 4)
where:

$VS_{LT,y}$	Annual volatile solid excretions for livestock LT entering all AWMS on a dry matter weight basis (kg -dm/animal/yr)
W_{site}	Average animal weight of a defined livestock population at the project site (kg)
$W_{default}$	Default average animal weight of a defined population (kg)
$VS_{default}$	Default value for the volatile solid excretion per day on a dry-matter basis for a defined livestock population (kg-dm/animal/day)
nd_y	Number of days treatment plant was operational in year y

(B) Annual average number of animals of type LT (N_{LT})
As per the methodology, there are four options to determine this value, via checking the options provided, via site inspection, CCIPL confirmed that there are two types of swine in this project, i.e., Nursery swine and Breeding swine. For Nursery swine, since there is no way to trace the daily stock, so the Option 1 is adopted to calculate NLT for Nursery swine. For Breeding swine, the PP can monitor the daily stock of breeding swine in a reliable way, discounting dead breeding swine and discarded them from the productive process from the daily stock. So, the Option 2 is adopted to calculate NLT for Breeding swine.

Option 1:

$$N_{LT} = N_{da,LT} * \left(\frac{N_{p,LT}}{365} \right)$$ （Equation 5） (ACM0010,V08.0,Equation 5a)

Where,

N_{LT}	Annual average number of animals of type *LT* for the year *y* (number)
$N_{da,LT}$	Number of days animal of type *LT* is alive in the farm in the year *y* (number)
$N_{p,LT}$	Number of animals of type *LT* produced annually for the year *y* (number)

Option 2:

$$N_{LT} = \frac{\sum_{1}^{365} N_{AA,\ LT}}{365}$$ (Equation 6 (ACM0010,V08.0, Equation 5b)

Where,

N_{LT}	Annual average number of animals of type *LT* for the year *y*

(number)

$N_{AA,LT}$ Daily stock of animals of type *LT* in the farm, discounting dead and discarded animals (number)

(C) B0,LT

As per the applied methodology, this value varies by species and diet. Default values are used and they are taken from tables 10A-4 through 10A-9 (IPCC 2006 Guidelines for National Greenhouse Gas Inventories volume 4, chapter10)/34/.

CCIPL verified that the maximum methane producing potential (B0,LT) for Market swine and Breeding swine in Asia region is 0.29 m^3 CH_4/kg VS is applicable to the project due to project is located in Liaoning Province, China, Asia which is verified by checking the Table 10A-7 and 10A-8 of IPCC 2006 Guidelines for National Greenhouse Gas Inventories volume 4, chapter10/34/.

(D) MCFj

As per the applied methodology, the MCFj values given in table 10.17, chapter 10, volume 4, IPCC 2006 Guidelines/34/ should be used. MCFj values depend on the annual average temperature where the anaerobic manure treatment facility in the baseline existed.

i. For this project, the annual average temperature is confirmed as 9.2℃ and the value of 65% applied is verified as consistent with IPCC/58/.

ii. A conservativeness factor should be applied by multiplying MCFj values (estimated as per above bullet) with a value of 0.94, to account for the 20% uncertainty in the MCFj values as reported by IPCC 2006/35/.

2. Baseline N_2O emissions (BEN_2O,y)

$$BE_{N2O,\ y} = GWP_{N2O} * CF_{N2O-N,N} * \frac{1}{1000} * \left(E_{N2O,D,y} + E_{N2O,ID,y}\right)$$

(Equation -7 ACM0010, V08.0, Equation 6)

where :

$BEN_2O_{,y}$ Annual baseline N_2O emissions in (t CO_2e/yr)

$GWPN_2O$ Global Warming Potential (GWP) for N_2O (t CO_2e/t N_2O)

$CFN_2O_{-N,N}$ Conversion factor N_2O-N to N_2O (44/28)

$EN_2O_{,D,y}$ Direct N_2O emission in year *y* (kg N_2O-N/year)

$EN_2O_{,ID,y}$ Indirect N_2O emission in year *y* (kg N_2O-N/year)

$$E_{N2O,D,y} = \sum_{j,LT} EF_{N2O,D,j} * NEX_{LT,y} * N_{LT} * MS\%_{Bl,j}$$ (Equation 8 ACM0010,V08.0, Equation 7)

where :

$E_{N2O,D,y}$ Direct N_2O emission in year *y* (kg N_2O-N/yr)

$EF_{N2O,D,j}$ Direct N_2O emission factor for the treatment system *j* of the manure management system (kg N_2O- N/kg N).

$NEX_{LT,y}$ Annual average nitrogen excretion per head of a defined livestock population (kg N/animal/yr)estimated as described in appendix 2 of applied methodology.

$MS\%_{BL,j}$	Fraction of manure handled in system *j* (fraction)
N_{LT}	Annual Average number of animals of type LT for the year *y* estimated as per equation (5) or (6)(number)

Estimation of various variables and parameters for above equations:

(A)Procedure for estimating $NEX_{LT,y}$

As per the Appendix 2 of the applied methodology/38/, two options provided, in the absence of availability of project specific information on protein intake, option 1 is missing the relevant parameters and cannot be used. For this project, neither specific information on Portion of that N intake nor site-specific national or regional data is available. So, the Option 2 is adopted to calculate $NEX_{LT,y}$

$$NEX_{LT,\ y} = \frac{W_{site}}{W_{default}} * NEX_{IPCCdefault}$$ (Equation -12-ACM0010,V08.0, Appendix 2 Equation 2)

where :

$NEX_{LT,y}$	Annual average nitrogen excretion per head of a defined livestock population (kgN/animal/yr)
W_{site}	Average animal weight of a defined livestock population at the project site (kg)
$W_{default}$	Default average animal weight of a defined population (kg)
$NEX_{IPCC\ default}$	Default value for the nitrogen excretion per head of a defined livestock population (kgN/animal/year)

Via checking the IPCC, it is confirmed that below equation is used for calculate NEX IPCC default

$$Nex_{(T)} = N_{rate(T)} \bullet \frac{TAM}{1000} \bullet 365$$ (Equation 13- IPCC 2006, volume 4, chapter 10 Equation 10.30)

where :

$N_{rate(T)}$	The default N excretion rate, kg N/ (1000 kg animal mass)/ day, table 10.19, chapter 10, volume 4 of IPCC 2006 Guidelines
TAM	Typical animal mass for livestock in kg/animal

3. Baseline CO_2 emission from electricity and/or heat used in the baseline

$$BE_{elec/heat,y} = BE_{BC,y} + BE_{HG,y}$$ (Equation -14 ACM0010,V08.0, Equation 9)

where :

$BE_{elec/heat,y}$	Baseline CO_2 emissions from electricity and/or heat used in the baseline (t CO_2/yr)
$BE_{EC,y}$	Baseline emissions associated with electricity generation in year *y* (t CO_2/yr)
$BE_{HG,y}$	Baseline emissions associated with heat generation in year *y* (t CO_2/yr)

The baseline scenario of this project is uncovered anaerobic lagoon, and no electricity and/or heat used in the baseline. Taking into account the conservative principle, the baseline CO_2 emission associated with power generation will not be accounted.

Project Emissions

Based on the applied methodology, and via site inspection checking the project implementation, CCIPL confirmed that there are two stages involved in the manure treatment for the project activity: (1) anaerobic digester; (2) aerobic composting.

The Project emissions are estimated as follows:

$$PE_y = PE_{AD,y} + PE_{Aer,y} + PE_{N2O,y} + PE_{EC/FC,y}$$ (Equation -15 ACM0010,V08.0, Equation 11)

where:

PE_y	Project emissions in year y
$PE_{AD,y}$	Project emissions associated with the anaerobic digester in year y (t CO_2e/yr)
$PE_{Aer,y}$	Project CH_4 emissions from aerobic AWMS treatment (t CO_2e/yr)
$PE_{N2O,y}$	Project N_2O emissions in year
$PE_{EC/FC,y}$	Project emissions from electricity consumption and fossil fuel combustion (t CO_2e/yr)

I) **PEAD,y**

$$PE_{AD,y} = PE_{EC,y} + PE_{FC,y} + PE_{CH4,y} + PE_{flare,y}$$ (Equation -16- Tool 14,V02.0, Equation 1)

where:

$PE_{AD,y}$	Project emissions associated with the anaerobic digester in year y (t CO_2e)
$PE_{EC,y}$	Project emissions from electricity consumption associated with the anaerobic digester in year y (t CO_2e)
$PE_{FC,y}$	Project emissions from fossil fuel consumption associated with the anaerobic digester in year y (t CO_2e)
$PE_{flare,y}$	Project emissions from flaring of biogas in year y (t CO_2e)
$PE_{CH4,y}$	Project emissions of methane from the anaerobic digester in year y (t CO_2e)

Since the electricity consumption of the anaerobic digestion system cannot be measured separately from the entire AWMS, so the Project emissions from electricity consumption associated with the anaerobic digester and that is not related to the anaerobic digester will be calculated together.

The project emissions from electricity consumption calculated according to TOOL 05 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 03.0)”,

a. $PE_{EC,y}$

$$PE_{EC,y} = \sum_{j,LT} EC_{PJ,J,y} * EF_{EF,j,y} * (1 + TDL_{j,y})$$

(Equation -17- Tool 14,V02.0, Equation 1)

where:

$PE_{EC,y}$	Project emissions from electricity consumption in year y (t CO_2e)
$EG_{PJ,J,y}$	Quantity of electricity consumed by the project electricity consumption source *j* in year *y* (MWh/yr)
$EF_{EF,j,y}$	Emission factor for electricity generation for source *j* in year *y* (t CO_2/MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source *j* in year *y*

b. $PE_{FC,y}$

Via site inspection, CCIPL confirmed that there are no fossil fuels involved in the project for anaerobic digestion process, hence $PE_{FC,y}$=0.

c. $PE_{flare,y}$

Via site inspection, it is confirmed that the residual excess gas stream will be flared by flaring, so the project emissions from flaring of biogas ($PE_{flare,y}$) shall be estimated using the tool 06 " Project emissions from flaring" (version 04.0)/41/

The calculation procedure in this tool determines the project emissions from flaring the residual gas ($PE_{flare,y}$) based on the flare efficiency ($\eta_{flare,m}$) and the mass flow of methane to the flare ($F_{CH4,RG,m}$). The flare efficiency is determined for each minute m of year y based either on monitored data or default values.

The calculation procedure of project emissions from flaring is given in the following steps:

STEP 1: Determination of the methane mass flow of the residual gas;
STEP 2: Determination of the flare efficiency;
STEP 3: Calculation of project emissions from flaring.

Step 1: Determination of the methane mass flow in the residual gas

The tool 08 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" /42/ shall be used to determine the following parameter $F_{CH4,m:}$
The following requirements apply:

(a) The gaseous stream to which the tool is applied is the residual biogas for flaring;
(b) The flow of the gaseous stream shall be measured continuously; Joint Validation & Verification Report:
(c) CH_4 is the greenhouse gas i for which the mass flow should be determined;
(d) The simplification offered for calculating the molecular mass of the gaseous stream is valid (equations 3 and 16 in the tool); and
(e) The time interval t for which mass flow should be calculated is every minute m.

$F_{CH4,m}$, which is measured as the mass flow during minute m, shall then be used to determine the mass of methane in kilograms fed to the flare in minute m ($F_{CH4,RG,m}$). $F_{CH4,m}$ shall be determined on a dry basis.

Therefore, option A is adopted to calculate the mass flow of the residual biogas for flaring as per Too 08 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0)/42/.

As per paragraph 23 of Tool 8:" Tool to determine the mass flow of a greenhouse gas in a gaseous stream (version 03.0)"/42/, the way to prove that the gaseous stream is dry needs to demonstrate that the temperature of the gaseous stream (Tt) is less than 60ºC (333.15 K) at the flow measurement point. For this project, the flowmeters installed in the outlet of the anaerobic tanks and the temperature of the anaerobic treatment unit of this project is designed as medium temperature i.e. 35~38 ºC/67/. Therefore, the gas temperature measured by the flowmeter does not exceed 60 ºC, it can be demonstrated that the gaseous stream is dry.

The mass flow of greenhouse gas i ($F_{i,t}$) is determined as follows:

$$F_{i,t} = V_{t,db} * v_{i,t,db} * \rho_{i,t}$$ （Equation 20- Tool 08,V03.0, Equation 9）

$$\rho_{i,t} = \frac{P_t * MM_i}{R_u * T_t}$$ （Equation 21- Tool 08,V03.0, Equation 10）

where：

$F_{i,t}$	Mass flow of greenhouse gas *i* in the gaseous stream in time interval *t* (kg gas/h)
$V_{t,db}$	Volumetric flow of the gaseous stream in time interval *t* on a dry basis (m^3 dry gas/h)
$v_{i,t,db}$	Volumetric fraction of greenhouse gas *i* in the gaseous stream in a time interval *t* on a dry basis (m^3 gas *i*/m^3 dry gas)

$\rho_{i,t}$	Density of greenhouse gas *i* in the gaseous stream in time interval *t* (kg gas *i*/m³ gas *i*)
Pt	Absolute pressure of the gaseous stream in time interval *t* (Pa)
MM_i	Molecular mass of greenhouse gas *i* (kg/kmol)
Ru	Universal ideal gases constant (Pa.m3/kmol.K)
Tt	Temperature of the gaseous stream in time interval *t* (K)

Step 2: Determination of flare efficiency

Via site inspection, CCIPL confirmed that the enclosed flares are applied.

According to tool 06 paragraph 21 /41/: in the case of encloses flares, the flare efficiency in the minute m ($\eta_{flare,m}$) is 90% when the flame is detected in the minute m ($Flame_m$):

(1) The temperature of the flare ($T_{EG.m}$) and the flow rate of the residual gas to the flare ($F_{RG,m}$) is within the manufacturer's specification for the flare ($SPEC_{flare}$) in minute *m*; and

(2) The flame is detected in minute *m* ($Flame_m$).

Otherwise $\eta_{flare,m}$ is 0%.

Since the flame is not detected in minute, therefore the flare efficiency $\eta_{flare,m}$ is 0%

Step 3: Calculation of project emissions from flaring

Project emissions from flaring are calculated as the sum of emissions for each minute m in year y, based on the methane mass flow in the residual gas ($F_{CH4,RG,m}$) and the flare efficiency ($\eta_{flare,m}$), as follows:

$$PE_{flare,y} = GWP_{CH4,y} * \sum_{m=1}^{525600} F_{CH4,GR,m} * (1 - \eta_{flare,m}) * 10^{-3}$$

（Equation 18- Tool 06,V04.0, Equation 15）

where：

$PE_{flare,y}$	Project emissions from flaring of the residual gas in year *y* (tCO_2e)
GWP_{CH4}	Global warming potential of methane valid for the commitment period (tCO_2e/tCH_4)
$F_{CH4,RG,m}$	Mass flow of methane in the residual gas in the minute *m* (kg)
$\eta_{flare,m}$	Flare efficiency in minute *m*

In summary, the Project emissions associated with the anaerobic digester in year y (t CO_2e) is the sum of the Project emissions of methane from the anaerobic digester in year y (t CO_2e), the project emissions from electricity consumption associated with the anaerobic digester and that is not related to the anaerobic digester and the project emission from flaring the biogas. i.e., $PE_{AD,y} = PE_{CH4,y} + PE_{EC,y} + PE_{flare,y}$.

d. $PE_{CH4,y}$

The project emissions from methane from the anaerobic digester is calculated according to the tool "Project and leakage emissions from anaerobic digesters (Version 02.0)"/43/. According to the tool, Project emissions of methane from the anaerobic digester include emissions during maintenance of the digester, physical leaks through the roof and side walls, and release through safety valves due to excess pressure in the digester.

These emissions are calculated using a default emission factor ($EF_{CH4,default}$), as follows:

$$PE_{CH4,y} = Q_{CH4,y} * EF_{CH4,default} * GWP_{CH4}$$ (Equation 19- Tool 14,V02.0, Equation 4)

where:

$EF_{CH4,default}$	Project emissions of methane from the anaerobic digester in year y (t CO_2e)
$Q_{CH4,y}$	Quantity of methane produced in the anaerobic digester in year y (t CH_4)
$EF_{CH4,default}$	Default emission factor for the fraction of CH_4 that leaks from the anaerobic digester (fraction)
GWP_{CH4}	Global warming potential of CH_4 (t CO_2 / t CH_4)

$Q_{CH4,y}$

Due to the project is a large scale, Q_{CH4},y was determined following step 1 and Option 1 of the applied tool. Below is the formula used for the calculation of $Q_{CH4,y}$

Option1: Procedure using monitored data

QCH4,y shall be measured using the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0)/42/. When applying the tool, the following applies:

(a) The gaseous stream to which the tool is applied is the biogas collected from the digester.

(b) CH_4 is the greenhouse gas I for which the mass flow should be determined; and

(c) The flow of the gaseous stream should be measured on an hourly basis or a smaller time interval; and then accumulated for the year y. Please note that units need to be converted to tons when applying the results in this tool.

The biogas is produced and collected from anaerobic digestion process. The flowmeters are installed at the outlet of the biogas digesters and the measured on an hourly basis time interval. So the quantity of methane produced in the digester in year y ($QCH4$,) is the accumulation of the mass flow of methane in the gaseous stream in an hourly basis time interval. i.e.,

As per the tool, the mass flow of greenhouse gas i ($F_{i,t}$) is determined as follows:

$$F_{i,t} = V_{t,db} * v_{i,t,db} * \rho_{i,t}$$ (Equation 20- Tool 08,V03.0, Equation 9)

$$\rho_{i,t} = \frac{P_t * MM_i}{R_u * T_t}$$ (Equation 21- Tool 08,V03.0, Equation 10)

where:

$F_{i,t}$	Mass flow of greenhouse gas *i* in the gaseous stream in time interval *t* (kg gas/h)
$V_{t,db}$	Volumetric flow of the gaseous stream in time interval *t* on a dry basis (m^3 dry gas/h)
$v_{i,t,db}$	Volumetric fraction of greenhouse gas *i* in the gaseous stream in a time interval *t* on a dry basis (m^3 gas *i*/m^3 dry gas)
$\rho_{i,t}$	Density of greenhouse gas *i* in the gaseous stream in time interval *t* (kg gas *i*/m^3 gas *i*)
P_t	Absolute pressure of the gaseous stream in time interval *t* (Pa)
MM_i	Molecular mass of greenhouse gas *i* (kg/kmol)
R_u	Universal ideal gases constant (Pa.m3/kmol.K)
T_t	Temperature of the gaseous stream in time interval *t* (K)

In summary, the final determined Project emission associated with the anaerobic digester for the project activity is $PE_{AD,y}$= $EF_{CH4,default}$+ $PE_{EC,y}$+ $PE_{flare,y}$.

ii) Project CH_4 emissions from aerobic AWMS treatment (PEAer, y)

IPCC guidelines specify emissions from aerobic lagoons as 0.1 per cent of total methane generating potential of the waste processed, which can be used as a default for all types of aerobic AWMS treatment.

$$PE_{Aer,y} = GWP_{CH4} * D_{CH4} * 0.001 * F_{Aer} * \left[\prod_{n=1}^{N}\left(1 - R_{VS,n}\right)\right] * \sum_{j,LT}\left(B_{0,LT} * N_{LT} * VS_{LT,y} * MS\%_j\right) + PE_{sl,y}$$

（Equation 22）

where:

GWP_{CH4}	Global Warming Potential (GWP) of CH_4 (t CO_2e/tCH_4)
$R_{VS,n}$	Fraction of volatile solid degraded in AWMS treatment method n of the N treatment steps prior to waste being treated (fraction)
D_{CH4}	Density of CH_4 (t/m^3)
F_{Aer}	Fraction of volatile solid directed to aerobic system (fraction)
LT	Type of livestock
$B_{o,LT}$	Maximum methane producing potential of the volatile solid generated by animal type LT (m^3CH_4/kg dm)
$VS_{LT,y}$	Annual volatile solid excretion livestock type LT entering all AWMS on a dry matter weight basis in(kg -dm/animal/yr)
N_{LT}	Annual average number of animals of type LT for the year y (number) as estimated in equation(5(a)) or (5(b))
PEsl,y	Project CH_4 emissions from sludge disposed of in storage pit prior to disposal during the year y (t CO_2e/yr)
MS%j	Fraction of manure handled in system j in the project activity (fraction)

All sludge produced from the aerobic composting will be used for land application which is calculated as leakage emission. So the PEsl,y=0.

So,

$$PE_{Aer,y} = GWP_{CH4} * D_{CH4} * 0.001 * F_{Aer} * \left[\prod_{n=1}^{N}\left(1 - R_{VS,n}\right)\right] * \sum_{j,LT}\left(B_{0,LT} * N_{LT} * VS_{LT,y} * MS\%_j\right)$$

（Equation 23）

where:

GWP_{CH4}	Global Warming Potential (GWP) of CH_4 (t CO_2e/tCH_4)
$R_{VS,n}$	Fraction of volatile solid degraded in AWMS treatment metho treatment steps prior to waste (sludge) being treated. (fractio
D_{CH4}	Density of CH_4 (t/m^3)
F_{Aer}	Fraction of volatile solid directed to aerobic system (fraction)
LT	Type of livestock
$B_{o,LT}$	Maximum methane producing potential of the volatile solid type LT(m^3CH_4/kg dm)
$VS_{LT,y}$	Annual volatile solid excretion livestock type LT entering matter weight basis (kg -dm/animal/yr)
N_{LT}	Annual average number of animals of type LT for the year y equation (5(a)) or (5(b))
$MS\%_j$	Fraction of manure handled in system j in the project activity (
MCF_{sl}	Methane conversion factor (MCF) for the sludge stored in slu

iii) Project N_2O emissions in year y ($PE_{N2O,y}$)

$$PE_{N2O,y} = GWP_{N2O} * CF_{N2O-N,N} * \frac{1}{1000} * \left(E_{N2O,D,y} + E_{N2O,ID,y}\right)$$

（Equation 24- ACM0010,V08.0, Equation 14)

where:

Project N_2O emissions in year y (t CO_2/yr)

Global Warming Potential (GWP) for N_2O (t CO_2e/t N_2O)

Conversion factor N_2O-N to N_2O (44/28)

Direct N_2O emission in year y (kg N_2O-N/year)

Indirect N_2O emission in year y (kg N_2O-N/year)

The same method used to estimate the emissions in the baseline should be used to estimate the project emissions of nitrous oxide, so the Option 1 is used to calculate the Project N_2O emissions $PE_{N2O, y}$

Option1:

$$E_{N2O,D,y} = \sum_{j,LT} EF_{N2O,D,j} * NEX_{LT,y} * N_{LT} * MS\%_j$$

（Equation 25- ACM0010,V08.0, Equation 15)

where:

$E_{N2O,D,y}$	Direct N_2O emission in year *y* (kg N_2O-N/yr)
$EF_{N2O,D,j}$	Direct N_2O emission factor for the treatment system *j* of the manure management system (kg N_2O-N/kg N)
$NEX_{LT,y}$	Annual average nitrogen excretion per head of a defined livestock population (kg N/animal/yr) estimated as described in appendix 2
$MS\%_j$	Fraction of manure handled in system *j* (fraction)
N_{LT}	Annual Average number of animals of type LT for the year *y* estimated as per equation (5(a)) or (5(b)) (number)

$$E_{N2O,ID,y} = \sum_{j,LT} EF_{N2O,ID} * F_{gasMS,j,LT} * NEX_{LT,y} * N_{LT} * MS\%_j$$

（Equation 26- ACM0010,V08.0, Equation 16)

where:

$E_{N2O,D,y}$	Direct N_2O emission in year *y* (kg N_2O-N/yr)
$E_{N2O,ID,y}$	Indirect N_2O emission in year y (kg N_2O-N/year)
$EF_{N2O,D,j}$	Direct N_2O emission factor for the treatment system j of the manure management system (kg N_2O-N/kgN)
$Q_{EM,m}$	Monthly volume of the effluent mix entering the manure management system (m^3/month)
$[N]_{EM,m}$	Monthly total nitrogen concentration in the effluent mix entering the manure management system (kgN/m^3)
$EF_{N2O,ID}$	Indirect N_2O emission factor for N_2O emissions from atmospheric deposition of nitrogen on soils and water surfaces (kg N_2O-N/kg NH3-N and NOX-N)
$F_{gasMS,j,LT}$	Default values for nitrogen loss due to volatilization of NH3 and NOX from manure management (fraction)

iV) Project emissions from use of heat and/or electricity (PEelec/heat)

$$PE_{EC/FC,y} = PE_{EC,y} + \sum_j PE_{FC,j,y}$$ （Equation 29- ACM0010,V08.0, Equation 19)

where:

$PE_{EC,y}$ Project emissions from electricity consumption in year y. The project emissions from electricity consumption will be calculated following the latest version of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption". In case, the electricity consumption is not measured then the electricity consumption shall be estimated as follows $EC_{PJ,y} = \sum_i CP_{i,y} * 8760$ ， where CPi,y is the rated capacity (in MW) of electrical equipment i used for the project activity.

$PE_{FC,y}$ Project emissions from fossil fuel combustion in process j during the year y. The project emissions from fossil fuel combustion will be calculated following the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". For this purpose, the processes j in the tool corresponds to all fossil fuel combustion in the AWMS (not including fossil fuels consumed for transportation of feed material and sludge or any other on-site transportation).

Via site inspection, CCIPL confirmed there is no consumption of heat related to the anaerobic digester. Hence, these emissions should not be considered.

Besides, as described in above, since the electricity consumption that is not related to the anaerobic digester cannot be separated from the total electricity consumption, therefore the emission for consumption of electricity is calculated in $PE_{EC,y.}$

The same for the $PE_{FC,y,}$ please refer to $PE_{FC,y}$ calculation in above.

Therefore, $PE_{elec/heat}$=0

Leakage

As per the applied methodology/38/, Leakage covers the emissions from land application of treated manure as well as the emissions related to anaerobic digestion in a digester, occurring outside the project boundary. These emissions are estimated as net of those released under project activity and those released in the baseline scenario. Net leakage is only considered if they are positive.

$$LE_y = \left(LE_{PJ,N2O,y} - LE_{BL,N2O,y}\right) + \left(LE_{PJ,CH4,y} - LE_{BL,CH4,y}\right) + LE_{AD,y}$$

（Equation 30- ACM0010,V08.0, Equation 20)

where:

$LE_{PJ, N2O, y}$ Leakage N_2O emissions released during project activity from land application of the treated manure in year y (t CO_2e/yr)

$LE_{BL, N2O, y}$ Leakage N_2O emissions released during baseline scenario from land application of the treated manure in year y (t CO_2e/yr)

$LE_{PJ, CH4, y}$ Leakage CH_4 emissions released during project activity from land application of the treated manure in year y (t CO_2e/yr)

$LE_{BL, CH4, y}$ Leakage CH_4 emissions released during baseline scenario from land application of the treated manure in year y (t CO_2e/yr)

$LE_{AD, y}$ Leakage emissions associated with the anaerobic digester in year y (t CO_2e)

i) Estimation of leakage N_2O emissions released during baseline scenario from land application of the treated manure in year y, LEBL, N_2O, y

$$LE_{BL,N2O,y} = GWP_{N2O} * CF_{N2O-N,N} * \frac{1}{1000} * \left(LE_{N2O,land,y} + LE_{N2O,runoff,y} + LE_{N2O,vol,y}\right)$$

（Equation 31- ACM0010,V08.0, Equation 21)

$$LE_{N2O,land,y} = EF_1 \prod_{n=1}^{N}\left(1-R_{N,n}\right) * \sum_{LT} NEX_{LT,y} * N_{LT}$$ (Equation 32-- ACM0010,V08.0, Equation 22）

$$LE_{N2O,runoff,y} = EF_5 * F_{leach} * \prod_{n=1}^{N}\left(1-R_{N,n}\right) * \sum_{LT} NEX_{LT,y} * N_{LT}$$

（Equation 33- ACM0010,V08.0, Equation 23）

$$LE_{N2O,vol,y} = EF_4 * \prod_{n=1}^{N}\left(1-R_{N,n}\right) * F_{gasm} * \sum_{LT} NEX_{LT,y} * N_{LT}$$

（Equation 34-- ACM0010,V08.0, Equation 24）

where:

GWP_{N2O}	Global Warming Potential (GWP) for N_2O (t CO_2e/t N_2O)
$CF_{N2O-N,N}$	Conversion factor N_2O-N to N_2O (44/28)
$LE_{N2O,land,y}$	Leakage N_2O emissions from application of manure waste in year y (kg N_2O-N/year)
$LE_{N2O,runoff,y}$	Leakage N_2O emissions due to leaching and run-off in year y (kg N_2O-N/year)
$LE_{N2O,vol,y}$	Leakage N_2O emissions due to volatilization in year y (kg N_2O-N/year)
F_{gasm}	Fraction of N lost due to volatilization (fraction)
N_{LT}	Annual average number of animals of type LT estimated as per equation (5) or (6) (number)
$NEX_{LT,y}$	Annual average nitrogen excretion per head of a defined livestock population (kg N/animal/year)estimated as described in appendix 2
EF_1	Emission factor for N_2O emissions from N inputs (kg N_2O-N/kg N input)
EF_5	Emission factor for N_2O emissions from N leaching and runoff in (kg N_2O-N/kg N leached and runoff)
EF_4	Emission factor for N_2O emissions from atmospheric deposition of N on soils and water surfaces, [kg N- N_2O/ (kg NH3-N + NOX-N volatilized)]
F_{leach}	Fraction of all N added to/mineralized in managed soils in regions where leaching/runoff occurs that is lost through leaching and runoff (fraction)
$R_{N,n}$	Nitrogen reduction factor (fraction)

ii) Estimation of leakage N_2O emissions released during project activity from land application of the treated manure in year y, LEPJ, N_2O

$$LE_{PJ,N2O} = GWP_{N2O} * CF_{N2O-N,N} * \frac{1}{1000} * \left(LE_{N2O,land,y} + LE_{N2O,runoff,y} + LE_{N2O,vol,y}\right)$$

（Equation 35- ACM0010,V08.0, Equation 25）

$$LE_{N2O,land,y} = EF_1 \prod_{n=1}^{N}\left(1-R_{N,n}\right) * \sum_{LT} NEX_{LT,y} * N_{LT}$$ (Equation 36- ACM0010,V08.0, Equation 26）

$$LE_{N2O,runoff,y} = EF_5 * F_{leach} * \prod_{n=1}^{N}\left(1-R_{N,n}\right) * \sum_{LT} NEX_{LT,y} * N_{LT}$$

（Equation 37-- ACM0010,V08.0, Equation 27）

$$LE_{N2O,vol,y} = EF_4 * \prod_{n=1}^{N}\left(1-R_{N,n}\right) * F_{gasm} * \sum_{LT} NEX_{LT,y} * N_{LT}$$

（Equation 38-- ACM0010,V08.0, Equation 28）

where:

GWP_{N2O}	Global Warming Potential (GWP) for N_2O (t CO_2e/t N_2O)
$CF_{N2O-N,N}$	Conversion factor N_2O-N to N_2O (44/28)
$LE_{N2O,land,y}$	Leakage N_2O emissions from application of manure waste in year y (kg N_2O-N/year)
$LE_{N2O,runoff,y}$	Leakage N_2O emissions due to leaching and run-off in year y (kg N_2O-N/year)
$LE_{N2O,vol,y}$	Leakage N_2O emissions due to volatilization in year y (kg N_2O-N/year)
F_{gasm}	Fraction of N lost due to volatilization (fraction)
N_{LT}	Annual average number of animals of type LT estimated as per equation (5) or (6) (number)
$NEX_{LT,y}$	Annual average nitrogen excretion per head of a defined livestock population (kg N/animal/year) estimated as described in appendix 2
EF_1	Emission factor for N_2O emissions from N inputs (kg N_2O-N/kg N input)
EF_5	Emission factor for N_2O emissions from N leaching and runoff in (kg N_2O-N/kg N leached and runoff)
EF_4	Emission factor for N_2O emissions from atmospheric deposition of N on soils and water surfaces, [kg N- N_2O/ (kg NH3-N + NOX-N volatilized)]
F_{leach}	Fraction of all N added to/mineralized in managed soils in regions where leaching/runoff occurs that is lost through leaching and runoff (fraction)
$R_{N,n}$	Nitrogen reduction factor (fraction)

It is possible to measure the quantity of manure applied to land in kg manure/yr (QDM) and the nitrogen concentration in kg N/kg manure (NDM) in the manure to estimate the total quantity of nitrogen applied to land. In this case, $\prod_{n=1}^{N}\left(1-R_{N,n}\right) * \sum_{LT} NEX_{LT,y} * N_{LT}$ should be substituted by $Q_{DM} * N_{DM}$.

iii) Estimation of leakage CH_4 emissions from land application of the treated manure

The calculation of methane emissions from land application of manure in the baseline and project cases are estimated as below:

$$LE_{BL,CH4,y} = GWP_{CH4} * D_{CH4} * MCF_d * \left|\prod_{n=1}^{N}\left(1-R_{VS,n}\right)\right| * \sum_{j,LT}\left(B_{0,LT} * N_{LT} * VS_{LT,y} * MS\%_j\right)$$

（Equation 39- ACM0010,V08.0, Equation 29）

$$LE_{PJ,CH4,y} = GWP_{CH4} * D_{CH4} * MCF_d * \left|\prod_{n=1}^{N}\left(1-R_{VS,n}\right)\right| * \sum_{j,LT}\left(B_{0,LT} * N_{LT} * VS_{LT,y} * MS\%_j\right)$$

（Equation 40- ACM0010,V08.0, Equation 30）

where:

$LE_{BL,CH4,y}$	Leakage CH_4 emissions released during baseline scenario from land application of the treated manure in year y (t CO_2e/yr)
$LE_{PJ,CH4,y}$	Leakage CH_4 emissions released during project activity from land application of the treated manure in year y (t CO_2e/yr)

$R_{VS,n}$	Fraction of volatile solid degraded in AWMS treatment method n of the N treatment steps prior to sludge being treated
GWP_{CH4}	Global Warming Potential (GWP) of CH_4 (t CO_2e/tCH_4)
D_{CH4}	Density of CH_4 (t/m^3)
$B_{0,LT}$	Maximum methane producing potential of the volatile solid generated by animal type LT (m^3CH_4/kg dm)
N_{LT}	Annual average number of animals of type LT estimated as per equation (5) or (6), expressed (number)
$VS_{LT,y}$	Annual volatile solid excretions for livestock LT entering all AWMS on a dry matter weight basis (kg - dm/animal/yr)
$MS\%_j$	Fraction of manure handled in system j in the project activity (fraction)
MCF_d	Methane conversion factor (MCF) assumed to be equal to 1

iV) Estimation of leakage emissions associated with the anaerobic digester

LEAD,y is determined using the methodological tool 14 “Project and leakage emissions from anaerobic digesters(Version 02.0).

The leakage emissions associated with the anaerobic digester (,) depend on how the digestate is managed. They include emissions associated with storage and composting of the digestate and are determined as follows:

$$LE_{AD,y} = LE_{storage,y} + LE_{comp,y}$$ （Equation 41- Tool 14 ,V02.0, Equation 5）

where:

$LE_{AD,y}$	Leakage emissions associated with the anaerobic digester in year *y* (t CO_2e)
$LE_{storage,y}$	Leakage emissions associated with storage of digestate in year *y* (t CO_2e)
$LE_{comp,y}$	Leakage emissions associated with composting digestate in year *y* (t CO_2e)

The anaerobic digestion process of this project is carried out in a fully enclosed system. The biogas generated during the treatment process will be captured for power generation or flared (if any). The Emissions from combustion will be calculated in project emissions (if any). After anaerobic digestion, the fermented sludge will be treated in aerobic composting system, which will be used as fertilizer. Wastewater from the new animal waste management systems will be treated aerobically and then used for agriculture irrigation. So, the Estimation of leakage emissions associated with the anaerobic digester is 0. i.e., LEAD,y =0

Emission reductions:

$$ER_y = BE_y - PE_y - LE_y$$ （Equation 42- ACM0010,V08.0, Equation 31）

ERy Emission reductions in year y (t CO_2e/yr).
Bey Baseline emissions in year y (t CO_2e/yr).
PEy Project emissions in year y (t CO_2e/yr).
LEy Leakage emissions in year y (t CO_2e/yr).

	Ex ante calculation of emission reductions For Baseline Emission calculation, as per the equation as below $BE_y = BE_{CH4,y} + BE_{N2O,y} + BE_{elec/heat,y}$ Based on above assessment, the ex-ante baseline emissions can be calculated as follows: Baseline Emissions: $BE_{CH4,y}$+ $BE_{N2O,y}$ = 1,13,638tCO_2e All the ex-ante determined values for each basic parameter for BE calculation is checked by CCIPL for both ex ante value for fixed parameters assessment as above and confirmed the ex-ante value for monitored parameters as below. The values used for the ex-ante baseline emissions calculation in both Joint-PDMR/1/ and ER sheet/2/ is verified as correct. **Project Emissions** Based on above assessment, final PE_y calculation for the project activity is listed as below $PE_y = PE_{AD,y} + PE_{Aer,y} + PE_{N2O,y} + PE_{EC/FC,y}$ Based on above assessment, the ex-ante project emissions can be calculated as follows: $PE_y = PE_{AD,y} + PE_{Aer,y} + PE_{N2O,y}$== 7,979t$CO_2$e All the ex-ante determined values for each basic parameter for PE calculation is checked by CCIPL for both ex ante value for fixed parameters assessment as above and confirmed the ex-ante value for monitored parameters as below. The values used for the ex-ante project emissions calculation in both Joint-PDMR/1/ and ER sheet/2/ is verified as correct. **Leakage** Based on above assessment, final Ley calculation for the project activity is listed as below $LEy = (LE_{PJ,N2O,y} - LE_{BL,N2O,y}) + (LE_{PJ,CH4,y} - LE_{BL,CH4,y})$ + LE $_{AD,y}$ = 0 tCo_{2e} All the ex-ante determined values for each basic parameter for LE calculation is checked by CCIPL for both ex ante value for fixed parameters assessment as above and confirmed the ex-ante value for monitored parameters as below. The values used for the ex-ante Leakage emissions calculation in both Joint-PDMR/1/ and ER sheet/2/ is verified as correct. Emission Reduction: ERy=BEy-PEy-LEy=113,638 -7,979-0=105,659tCO_2e
Findings	CAR 06 and CL 09 has been raised in this regard and successfully resolved. Please refer appendix 4 for details
Conclusion	Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reduction conservatively calculated to be 105,659 tCO_2e per year. The calculation of the emission reductions has been ensured by the validation team based on the VER calculation sheet./02/.

D.5.Monitoring plan

Means of validation	**Data and parameters fixed ex-ante:** Data/parameter | Unit | Value applied | Assessment

Global Warming Potential of CH4 (GWP_{CH4})	tCO_2e/tCH_4	28	Confirmed as per the GS requirement and IPCC Fifth Assessment Report/35/ and consistentwith the PDD
Global Warming Potential of N_2O (GWP_{N2O})	tCO_2e/TJ	265	Confirmed as per the GS requirement and IPCC Fifth Assessment Report/35/ and consistentwith the PDD
Density of CH_4 (D CH_4)	t/m^3	0.00067	Confirmed as correct for ex ante determination as per the applied methodology/38/
Methane conversion factor for the baseline AWMSj (MCF_j)	%	61.1%	Confirmed as correct for ex ante determination as per the IPCC/34/. A conservativeness factor has been applied by multiplying MCFj value with a value of 0.94, to account for the 20 per cent uncertainty in the MCFj values. For this project, the annual average temperature is 10℃ and the value of 65% is applied as reported by IPCC 2006/34/. Therefore, MCFj value of 61.1% is applied.
Fraction of manure handled in system j in the baseline ($MS\%_{Bl,j}$)	Fraction	Liquid $MS\%_{Bl,j}$=30%*76%=22.8% Solid $MS\%_{Bl,j}$ =1-22.8%=77.2% Liquid $MS\%_{Bl,j}$+Solid $MS\%_{Bl,j}$ =100%	Confirmed as correct for ex ante determination. The PER/6/ and baseline evidence/18/ is checked and confirmed.
Default average animal weight of a defined population ($W_{default}$)	kg	$W_{default}$(Breeding swine)=28kg	Confirmed as correct for ex ante determination as per the IPCC/34/ and the values in IPCC 2006 and US-EPA are compared and the lower value from IPCC 2006 is applied.
Default value for the volatile solid excretion per day on a dry-matter basis for a defined livestock population ($VS_{default}$)	kg-dm/animal/day	$VS_{default}$(Breeding swine)=0.3	Confirmed as correct for ex ante determination as per the IPCC/34/ and the values in IPCC 2006 and US-EPA are compared, the value of $VS_{default}$ is not available in US-EPA. Therefore, the value in 2006 IPCC is applied in the project.

Default value for the nitrogen excretion per head of a defined livestock population ($NEX_{IPCC\ default}$)	kg N/ animal/year	$NEX_{IPCC\ default}$ (Breeding swine) =2.45	Confirmed as correct for ex ante determination according to the calculation equation, while Nrate(T) and TAM are default value from IPCC 2006.
default N excretion rate ($N_{rate,(T)}$)	kg N (1000 kg animal mass)$^{-1}$ day^{-1}	$N_{rate,(T)}$(Breeding swine) =0.24	Confirmed as correct for ex ante determination as per the IPCC/34/.
typical animal mass for livestock category (TAM)	kg animal^{-1}	TAM (Breeding swine) =28	Confirmed as correct for ex ante determination as per the IPCC/34/.
Default values for nitrogen loss due to volatilization of NH_3 and NO_X from manure management ($F_{gas\ MS,j,LT}$)	Fraction	40%, 45%	Confirmed as correct for ex ante determination as per the IPCC/34/.
Direct N_2O emission factor for the treatment system j of the manure management system ($EF_{N2O,D,j}$)	Kg N_2O-N/kg N	$EF_{N2O,D,j}$=0 for anaerobic lagoon and digester, $EF_{N2O,D}$=0.01 for aerobic lagoon	Confirmed as correct for ex ante determination as per the IPCC/34/.
Indirect N_2O emission factor for the treatment system j of the manure management system ($EF_{N2O,ID,j}$)	kgN_2O-N/kg NH_3-N and NO_X-N	0 for uncovered anaerobic pond,0.01 for composting-passive strip stacking	Confirmed as correct for ex ante determination as per the IPCC/34/.
Default emission factor for the fraction of CH_4 produced that leak from the anaerobic digester (fraction) ($EF_{CH4,default}$)	t CH_4 leaked / t CH_4 produced	0.05	Confirmed as correct for ex ante determination as per the tool/43/. Via checking the Digester equipment purchase contract/10/,CCIPL confirmed that the Digester type in the PDD is correct and actual which is identified by manufacturer information.
Fraction of volatile solid degraded in AWMS treatment method n of the N treatment steps prior to waste being treated ($R_{VS,n}$)	Fraction	$R_{VS,n}$, aerobic treatment and anaerobic digester: 20%, 80% for leakage N_2O emission released during project activity	Confirmed as correct for ex ante determination as per the Appendix 1 of methodology ACM0010/38/. For proposed project, before the treated manure is applied to the land, it undergoes two stages of pre-treatmentandan

				$R_{VS,n}$, one cell lagoon:85% for leakage N_2O emission released during baseline scenario	anaerobic-aerobic combined treatment technology,thepre-treatment belongto underfloor pit storage in the Appendix 1 of applied methodology ACM0010 (version 08.0), so, the RVS,n is 20% which is the most conservative value. The anaerobic-aerobic combined treatment technologybelongsto covered first cell of two cell lagooninthe Appendix 1 of applied methodologyACM0010 (version 08.0), so the RVS is 80% which is the most conservative value. Via checking Appendix 1 of methodology ACM0010/38/,CCIPL confirmed that 85% is most conservative value for the one cell lagoon in baseline scenario.	
		Nitrogen reduction factor ($R_{N,n}$)	Fraction	$R_{N,n}$, aerobic treatment and anaerobic digester:5%,25 % $R_{N,n}$, uncovered anaerobic lagoon : 80%	Confirmed as correct for ex ante determination as per the Appendix 1 of methodology ACM0010/38/. The treatment process of this projectisan anaerobic-aerobic combined treatment technology. It undergoes two stagesofpre-treatment and the an anaerobic-aerobic combined treatment technology the pre-treatment belong to underfloor pit storage in the Appendix 1 of applied methodology ACM0010 (version 08.0), so, the RN,n is 5% which is the most conservative value. The anaerobic-aerobic combined treatment technology belongs to covered first cell of one cell lagoon in the Appendix 1 of applied methodologyACM0010 (version 08.0), so the RN,n is 25% which is the	

				most conservative value. Via checking Appendix 1 of methodology ACM0010/38/,CTI confirmed that 80% is most conservative value for the one cell lagoon in baseline scenario.
Emission factor for N2O emissions from N inputs; from N leaching and runoff; from atmospheric deposition of N on soils and water surfaces (EF_1, EF_4, EF_5)	kg N_2O-N/kg N for EF_1, EF_5 and [kg N_2O-N/(kg NH_3-N and NO_X-N) for EF_4	EF_1 = 0.010 EF_4 =0.010 EF_5 = 0.0075	Confirmed as correct for ex ante determination as per the IPCC/34/
Fraction of N lost due to volatilization (F_{gasm})	(kg NH_3–N + NO_x–N) (kg N applied)	0.2	Confirmed as correct for ex ante determination as per the IPCC/34/
Fraction of all N added to/mineralized in managed soils in regions where leaching/runoff occurs that is lost through leaching and runoff (F_{leach})	Fraction	0.3	Confirmed as correct for ex ante determination as per the IPCC/34/
Methane conversion factor for leakage calculation (MCF_d)		1	Confirmed as correct for ex ante determination as per the applied methodology/38/. Methane conversion factor for leakage calculation assumed to be equal 1.
Emission factor for electricity generation ($EF_{EF,j,y}$)	tCO_2/MWh	0.66125	Confirmed as correct for ex ante determination as per the DNA data/33/
Universal ideal gases constant (R_u)	Pa.m^3/kmol.K	8,314	Confirmed as correct for ex ante determination as per the applied Tool to determine the mass flow of a greenhouse gas in a gaseous stream (version 03.0)/42/
Molecular mass of greenhouse gas i (MM_i)	kg/kmol	16.04 kg/kmol for methane	Confirmed as correct for ex ante determination as per the applied Tool to determine the mass flow of a greenhouse gas in a gaseous stream (version 03.0)/42/

Flare efficiency in minute m ($\eta_{flare,m}$)	%	80%	Confirmed as correct closed flare as per the applied Project emissionsfrom flaring (version 04.0)"/41/

Data and parameters to be monitored:

Parameter	Monitoring frequency	Description/Assessment
Np,LT - Number ofanimals oftype LT produced annually forthe year y	Monitoredmonthly	$N_{p,LT}$ will be monitored by PP monthly by collected for each swine population in all of the pig barns. The number of swine produced in the farm will be recorded manually by the responsible staff. The ex-ante value 48,000 heads of marketing swine is derived from Project evaluation report/6/. QA/QC procedure is defined as the indirect information (sale records/17/) will be crosschecked as per the request in the applied methodology which is verified as adequate.
Nda,LT - Number ofdays animal oftype LT isalive in thefarm in theyear y	Monitoredmonthly	$N_{da,LT}$ will be monitored by PP monthly. each swine population in all of the pig barns. The number of swine produced in the farm will be recorded manually by the responsible staff. The ex-ante value 48,000 heads of marketing swine is derived from Project evaluation report/6/. QA/QC procedure is defined as the indirect information (sale records/17/) will be crosschecked as per the request in the applied methodology which is verified as adequate.
Wsite - Average animal weight of adefined livestock population at the project site	Monitored monthly	W_{site} will be monitored by PP monthly. Sampling procedures will be used to estimate this variable following guidance as provided in the methodology.

				The ex-ante value 180.00 kg for breeding swine is derived from PER/6/. The PDD has described the system of random sampling taking into account stratification of each livestock population into a minimum of three weight categories as per the request in the applied methodology/38/ which is verified as adequate QA/QC procedure.
		n_{dy}- Number ofdays treatment plant was operational in year y	Daily	n_{dy} will be monitored by PP daily. The ex-ante value 365 days is confirmed as reasonable due to it is expected that the treatment plantoperated every day. Production record from the DCS system can be crosschecked if the treatment plant is operational which is verified as adequate QA/QC procedure.
		$EC_{PJ,j,y}$- Quantity ofelectricity consumed bythe proposed projectin year y	Continuous measurement and at least monthly recording	$EC_{PJ,j,y}$ will be monitored by electricity meters continuously and at least monthly recording by PP. The ex-ante value 3,724 MWh/yr is derived from Project evaluation report/PER/. The total installed capacity of the first phase of the project (swine on hand: 16,000) is 141.7kw. Therefore, the total installed capacity of the project after completion (swine on hand: 48,000) is 141.7*3= 425.1kw, the electricity consumption ECP,J,y= =425.1/1000*8760=3,724MWh During the monitoring period, the electricity consumption supplied bythe gird company, then the value will be confrimed by the electricity meters monitoring and cross-check with the grid statement. The calibration of electricity meters, including the

			frequency of calibration, should be done in accordance with national standards or requirements which is verified as adequate QA/QC procedure. CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.
	Vt,db - Volumetric flow of the gaseous stream intime interval t on a dry basis	Continuous measurement	$V_{t,db}$ will be monitored by flowmeters continuously. The ex-ante value was estimated according to the amount of manure. Volumetric flow measurement should always refer to the actual pressure and temperature. The periodic calibration against a primary device provided by an independent accredited laboratory is mandatory, the calibration and frequency of calibration should be in accordance with manufacturer's specifications which is verified as adequate QA/QC procedure. CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.
	$V_{i,t,db}$ Volumetric fraction of greenhouse gas i in a time interval t on a dry basis	Continuous measurement	$V_{i,t,db}$ will be monitored by gas analyzers continuously. The ex-ante value was derived from Project evaluation report/6/. Continuous gas analyser operating in dry-basis. Volumetric flow measurement should always refer to the actual pressure and temperature. Calibration should include zero verification with an inert gas (e.g. N_2) and at least one reading verification with a standard gas (single calibration gas or mixture calibration gas). All calibration gases must have a certificate provided by the manufacturer and must be under their validity period which is verified as adequate QA/QC procedure.

			CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.
	T_t Temperature of the gaseous stream in time interval t	Continuous unless differently specified in the underlying methodology	T_t will be monitored by recordable electronic signal continuously. The temperature Tt(K) is calculated as the equation T(K)=t(°C) +273.15 The ex-ante value was estimated according to the applied methodology. Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration is according to the design and the implementation plan document/12/ which is verified as adequate QA/QC procedure. CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.
	P_t Pressure of the gaseous stream in time interval t	Continuous unless differently specified in the underlying methodology	P_t will be monitored by recordable electronic signal continuously. The ex-ante value was estimated according to the applied methodology. Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration is according to the design and the implementation plan document/12/ which is verified as adequate QA/QC procedure. CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.
	F_{Aer} Fraction of volatile solids directed to aerobic treatment	Annually	F_{Aer} will be monitored annually. The ex-ante value was estimated according to the applied methodology. 100% was used in the pre-calculation. There is no condition for monitoring

			Fraction of volatile solids directed to aerobic treatment, according to the conservative principle, use the maximum value of 100% The periodic calibration against a primary device provided by an independent accredited laboratory is mandatory, the calibration and frequency of calibration should be in accordance with the design and the implementation plan document/12/ which is verified as adequate QA/QC procedure. CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.	
		$B_{0, LT}$ Maximum methane producing potential of the volatile solid generated by animal type LT	Annually	$B_{0, LT}$ will be monitored annually. The ex-ante value was estimated from IPCC 2006 table 10A-7 and 10A-8, chapter 10, volume 4 The periodic calibration against a primary device provided by an independent accredited laboratory is mandatory, the calibration and frequency of calibration should be in accordance with the design and the implementation plan document/12/ which is verified as adequate QA/QC procedure. CCIPL confirmed that PDD has described the monitoring requirement in line with the applied methodology.	
		Number of males and females employed by the project	Once for each monitoring period.	The value used , 2 jobs are created including 1 male and 1 female during the operation period of the project for ex-ante determination as per the Record keeping book/25/ and labor contracts/26/ and interview with project owner about the recruitment plan. It will be monitored once for each monitoring period through the parameter	

			number of jobs created by checking the Record keeping books/25/ and labor contracts/26/. By recording jobs that have been created through the project for activities, the number of people participating in the project-related activities will be determined. After the first verification, only changes in employees will be reported and the results will also be cross checked with labor contract which is verified as adequate QA/QCprocedure.
	Employee Training of biogas safety operation	Annualy	The employees will be trained on the safety operation of the biogas. It will be monitored annually through checking the Training records/27/. Meeting attendance record will be cross-checked which is verified as adequate QA/QC procedure. By recording the training on the safety operation of the biogas, the Mitigation Measure for Safeguarding Principles will be determined.
Findings	CAR 07, CL 04, CL05, CL08 and CL 10 had been raised in this regard and successfully resolved. Please refer appendix 4 for details		
Conclusion	CCIPL confirms that the monitoring plan mentioned in the PDD is in accordance with the requirements mentioned in the monitoring methodology and the local regulatory requirements, as well the monitoring arrangements described in the monitoring plan are feasible within the project design. CCIPL is of the opinion that the monitoring plan will give opportunity for real measurement of achieved emissions reductions for the crediting period.		

D.6.Sustainable development co-benefits

Means of validation		Parameter	Description/Assessment
	1.	Decent Work and Economic Growth (SDG 8)	**Monitoring parameter:** Employment generation from the project. **Way of monitoring**: PP shall keep employment records, payment records, as part of monitoring this parameter.

	2.	Responsible consumption and production (SDG 12)	**Monitoring parameter:** Amount of organic fertilizer generation from the project. **Way of monitoring:** PP shall keep organic fertilizer records, electronic truck scale records, animal records as part of monitoring this parameter.
	3.	Climate Action (SDG 13)	**Mitigation Measure:** GHG emission reductions from manure management systems. **Way of monitoring:** specific calculation methods for baseline, project and leakage emissions as well as monitoring plan from applied methodology.
	Mechanism to input continuous grievances: As part of continuous grievance mechanism PP has highlighted the mechanism in stakeholder consultation report and also in the PDD. A grievance register shall be kept at Administration Office of Jintai Yangxiang/19/ to record any grievance raised by stakeholders. Since, the project is retroactive project implementation is already, and no comments received yet. The stakeholders found aware of the grievance mechanism system. Therefore, the continuous grievance input mechanism is in place.		
Findings	CL 01 and CL 07 had been raised in this regard and successfully resolved. Please refer appendix 4 for details		
Conclusion	CCIPL confirms that sustainability monitoring plan and indicators included in the PDD confirm to the sustainable development requirements of GS4GG.		

D.7. Stakeholder Inputs & Grievance Mechanism

Means of validation	Discussion of continuous input /grievance mechanism As part of the grievance mechanism in place, the local stakeholders are encouraged to approach the PP through following avenues i.e. in-person, and telephone to express their grievance, if any. Through meet agenda review and discussion with PP validation team understand that PP had discussed environmental and social aspects of project activity along with sustainability goals selected by project activity with local stakeholders. The project proponent informed the users about the input and grievance mechanism. They were informed about the maintenance of a grievance expression book which would be maintained to have a continuous account of stakeholder's feedback. Grievance Expression Process Book have been located at Administration Office of Jintai Yangxiang. as the stakeholders' chosen places. The site is appropriate publicly accessible location where local stakeholders can provide their feedback about the project.
Findings	CL 11 had been raised in this regard and successfully resolved. Please refer appendix 4 for details
Conclusion	Validation team has checked the corresponding documents /19/ and found in line with the GS4GG requirements. The validation team confirms that the project activity meets the Gold Standard requirements for stakeholder feedback/ grievance mechanism.

SECTION E.Internal quality control

>>

The final validation report has undergone a technical review and quality review before being submitted to the project participant and Gold Standard. A technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM/GS validation and verification performed the technical review.

SECTION F.Validation opinion

>>

The VVB (Carbon Check (India) Private Ltd.) hereafter referred to as CCIPL, has been appointed by Henan Yangxiang Breeding Co., Ltd (the PP) to perform validation of their PA "Jintai Animal Manure Management System GHG Mitigation Project ". The validation was performed on the basis of the UNFCCC criteria for the Clean Development Mechanism and GS4GG requirements. The scope of the validation is defined as an independent and objective review of the project design document (PDD) /01/, meets all applicable GS requirements, including those specified in the CDM Project Standard for PA /47//48//49/, GS4GG Principles and requirements version 1.2 and other relevant GS4GG applicable rules /47/, relevant methodology /38/, tools and guidelines and article 12 of the Kyoto Protocol, paragraph 37 of CDM modalities and procedures, subsequent decisions by the COP/MOP and CDM Executive Board. The project's baseline establishment and monitoring plan and other relevant documents. The information in these documents is reviewed against Gold standard Validation and Verification Standard V1 /80/, Kyoto Protocol requirements, CDM Modalities & Procedures and subsequent decisions and guidance by the COP/MOP and CDM Executive Board and GS4GG requirements.

The report is based on the assessment of the PDD /01/ undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, stakeholder interviews, review of the applicable/applied methodology /38/ and their underlying formulae and calculations.

The Validation team confirms the contractual relationship signed between the VVB, CCIPL and Henan Yangxiang Breeding Co., Ltd . The team assigned to the validation meets the CCIPL internal procedures including the UNFCCC requirements for the team composition and competence. The validation team has conducted a thorough contract review as per UNFCCC and CCIPL's procedures and requirements.

Validation methodology and process

The validation has been performed as per the requirements described in the Gold Standard for the Global Goals Principles & Requirements (version 1.2); and Gold standard validation and verification standard V1 /80/ /47/ and constitutes the review and completion of the following steps:

- Desk review of the PDD /01/, and ER spread sheet /02/
- Review of the applied monitoring methodology ACM0010 Version 8.0" /38/
- Onsite interview (20/06/2023)
- Issuance of Draft Validation Report
- Resolution of CARs and CLs raised during verification
- Issuance of Final Validation Report.

The PA will result in emissions reductions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the PA is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the PA.

The validation did not reveal any information that indicates that the PA can be seen as a diversion of ODA funding /24/.

The PDD /01/ contains monitoring plan for the monitoring of the emission reductions from the PA. The monitoring arrangement described in the monitoring plan is feasible within the project design and its CCIPL's opinion that the project participants are able to implement the monitoring plan.

Carbon Check (India) Private Ltd. concludes the validation with a positive opinion that the GS PA "Jintai Animal Manure Management System GHG Mitigation Project ", as described in the PDD /01/, meets all applicable CDM/GS requirements, including those specified in the CDM Project Standard for PA /47//48//49/, GS4GG PA requirement and relevant methodology /38/ and article 12 of the Kyoto Protocol, paragraph 37 of the CDM modalities and procedures and the subsequent decisions by the COP/MOP and CDM Executive Board.

Carbon Check (India) Private Ltd., therefore, requests the registration of the project activity as a GS PA with Gold Standard.

Appendix 1.Abbreviations

Abbreviations	Full Texts
BE	Baseline Emission
CAR	Corrective Action Request
CCIPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CER	Certified Emission Reduction
CL	Clarification Request
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COP/MOP	Conference of Parties/ Meeting of Parties
DNA	Designated National Authority
DR	Document Review
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas
GS	Gold Standard
GS4GG	Gold Standard for global goals
I	Interview
IPCC	Intergovernmental Panel on Climate Change
LE_y	Leakage
LoA	Letter of Approval
LSC	Local Stakeholder Consultation
LS	Local Stakeholder
MoV	Means of Validation
NA	Not applicable
ODA	Official Development Assistance
AWMS	Advanced Waste Management Systems
UASB	Up flow Anaerobic Sludge Blanket Reactor
OSV	On Site Visit
PE	Project Emission
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
PCP	Project Cycle Procedure
SD	Sustainable Development
T	Tonne
UNFCCC	United Nations Framework Convention on Climate Change
VPA	Voluntary Project Activity
VVS	Validation and Verification Standard
VVB	Validation and Verification Body

Appendix 2.Competence of team member and technical reviewers

Carbon Check (India) Private Limited

Certificate of Competency

Mr. Vijay Mathew

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☒ Validator	☒ Verifier	☒ Team Leader	☒ Technical Expert
☒ Technical Reviewer	☐ Health Expert	☐ Gender Expert	☐ Plastic Waste Expert
☒ SDG+	☒ Social no-harm(S+)	☒ Environment no-harm(E+)	☐ CCB Expert
☒ Financial Expert	☒ Local Expert for India		

in the following Technical Areas:

☐ TA 1.1	☒ TA 1.2	☐ TA 2.1	☒ TA 3.1	☐ TA 4.1
☐ TA 4. n	☐ TA 5.1	☐ TA 5.2	☐ TA 7.1	☐ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☒ TA 13.1	☒ TA 13.2
☐ TA 14.1	☐ TA 15.1			

Issue Date

1st January 2023

Expiry Date

31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Carbon Check (India) Private Limited

Certificate of Competency

Mr. Amit Anand

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☒ Validator	☒ Verifier	☒ Team Leader	☒ Technical Expert
☒ Technical Reviewer	☐ Health Expert	☐ Gender Expert	☒ Plastic Waste Expert
☒ SDG+	☒ Social no-harm(S+)	☒ Environment no-harm(E+)	☒ CCB Expert
☒ Financial Expert	☐ Local Expert for India and South Africa		

in the following Technical Areas:

☒ TA 1.1	☒ TA 1.2	☐ TA 2.1	☒ TA 3.1	☐ TA 4.1
☐ TA 4. n	☐ TA 5.1	☐ TA 5.2	☒ TA 7.1	☒ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☒ TA 13.1	☒ TA 13.2
☒ TA 14.1	☒ TA 15.1			

Issue Date	Expiry Date
1st January 2023	31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Carbon Check (India) Private Limited

Certificate of Competency

Ms. Nara Shen Yan

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☒ Validator	☒ Verifier	☐ Team Leader	☒ Technical Expert
☐ Technical Reviewer	☐ Health Expert	☐ Gender Expert	☐ Plastic Waste Expert
☐ SDG+	☐ Social no-harm(S+)	☐ Environment no-harm(E+)	☐ CCB Expert
☐ Financial Expert	☒ Local Expert for China		

in the following Technical Areas:

☐ TA 1.1	☒ TA 1.2	☐ TA 2.1	☐ TA 3.1	☐ TA 4.1
☐ TA 4. n	☐ TA 5.1	☐ TA 5.2	☐ TA 7.1	☐ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☐ TA 13.1	☐ TA 13.2
☐ TA 14.1	☐ TA 15.1			

Issue Date

1st January 2023

Expiry Date

31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Carbon Check (India) Private Limited

Certificate of Competency

Mr. S. Ranganathan

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☒ Validator	☒ Verifier	☒ Team Leader	☒ Technical Expert
☒ Technical Reviewer	☐ Health Expert	☐ Gender Expert	☐ Plastic Waste Expert
☒ SDG+	☒ Social no-harm(S+)	☒ Environment no-harm(E+)	☐ CCB Expert
☒ Financial Expert	☒ Local Expert for India		

in the following Technical Areas:

☒ TA 1.1	☒ TA 1.2	☐ TA 2.1	☒ TA 3.1	☐ TA 4.1
☐ TA 4. n	☒ TA 5.1	☐ TA 5.2	☐ TA 7.1	☐ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☒ TA 13.1	☒ TA 13.2
☐ TA 14.1	☐ TA 15.1			

Issue Date

1st January 2023

Expiry Date

31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Appendix 3.Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	PD	GS4GG Project Design document of "Hongwang Animal Manure Management System GHG Mitigation Project in Fangcheng County"	- Version No. 01, dated 15/12/2022 - Version No. 02, dated 25/04/2023 - Version No. 03, dated 06/09/2023 - Version No. 04, dated 17/10/2023	PD
2.	PD	Emission Reduction Calculation spreadsheet of "Hongwang Animal Manure Management System GHG Mitigation Project in Fangcheng County"	- Version No. 01.5, dated 08-06-2023 - Version No. 1.7, dated 28-06-2023 - Version No. 02.1, dated 28-10-2023 -	PD
3.	PD	Stakeholder Consultation Report of "Hongwang Animal Manure Management System GHG Mitigation Project in Fangcheng County"	- Version No. 01, dated 17/12/2022	PD
4.	PD	IRR calculation sheet	- Version No. 01.5, dated 08-06-2023 - Version No. 1.7, dated 28-06-2023 - Version No. 02.1, dated 28-10-2023	PD
5.	Local Market Supervision and Administration Bureau	Business License of PP	07/06/2016	PP
6.	Xinmin Jintai Yangxiang Agriculture and Animal Husbandry Co. Ltd.	Project Evaluation Report	Issued on 14/02/2021	PP
7.	Nanyang Institute of Environmental Protection Science Co., Ltd.	Environment Impact Assessment (EIA)	Issued in 30/03/2017	PP
8.	Ecology and Environment Bureau of Nanyang City	EIA approval	Issued on 08/04/2021	PP

9.	Local Bureau of Agriculture and Rural Affairs and Animal Husbandry and Veterinary Service	Licenses for production and operation	Licenses for production and operation of the breeding livestock and poultry- 30/03/2017	PP
10.	PP and Weifang Kangcheng Environmental Protection Engineering Co., Ltd.	Equipment purchases contracts with Weifang Kangcheng Environmental Protection Engineering Co., Ltd.	21/12/2021	PP
11.	PP and Weifang Kangcheng Environmental Protection Engineering Co., Ltd.	General construction and installation contract	General construction and installation contract of the project signed on 21/12//2021	PP
12.	PP	Design and implementation plan of 400t/day- waste treatment project		PP
13.	PP	Operation log of the project	Operation log of the project-(March 2022- May 2023)	PP
14.	PP	Technical flow chart	Technical flow chart in the project site	PP
15.	PP	Record of operation started date of each swine farm	Record of operation started date of each swine farm-(March 2022-May 2023)	PP
16.	PP	Record of construction and operation started date of AWMS plant	Record of construction and operation started date of AWMS plant issued by National Environmental Protection regulation and Environmental Assessment.	PP

17.	PP	Sale records of marketing swine	Sale records of breeding swine of year 2022	PP
18.	Peoples Republic of China	Environagrimental Protection Law of the People's Republic of China[5]	Environmental Protection Law of the People's Republic of China -- china.org.cn	PP
19.	PP	Local Stakeholder Consultation Records	Localstakeholderconsultation process evidences: - The email for invitation; - Photo of all the invitation channel - LSC Meeting attendance's list with signature; - All filled evaluation forms by attendance in the Meeting - Grievance register	PP
20.	PP	Stakeholder Feedback Round	StakeholderFeedbackRound process evidences: - The email for invitation of the on-line consultation; - The feedback emails	PP
21.	PD and Expert stakeholders	Expert stakeholders' consultation records	Expert stakeholders' consultation records including email interview records- 24/12/2022 to 24/02/2023	PP
22.	PP	Declaration of no double counting and not involved in other GHG scheme	Issued on 27/11/2022	PP
23.	PP and Fangcheng Yuyuan Fertilizer Co., Ltd.	Announcement of Organic fertilizer is distributed free of charge	Issued on 25/02/2022	PP
24.	PP	ODA declaration	Declaration of Non-Use of ODA by project owner of GS12048 issued on 27/11/2022	PP
25.	PP	Record keeping book	Record keeping book including employment and salary -(March 2022- May 2023)	PP

[5] https://www.mee.gov.cn/ywgz/fgbz/fl/201404/t20140425_271040.shtml

26.	PP and employees	Labor contracts	Labor contracts signed with employees for implementation of this project- 20/01/2022-19/01/2032	PP
27.	PP	Technical Training Records	TechnicalTraining Recordsof project 1. Annual Training Records 2. Training register list	PP
28.	National Government	Labor Law of the People's Republic of China	-	Public Website
29.	Ministry of Agriculture and Rural Affairs of China	National Action Plan	National Action Plan for Resource Utilization of Livestock Manure (2017-2020) http://www.moa.gov.cn/nybgb/2017/dbq/201801/t20180103_6134011.htm	Public Website
30.	National Ministry of Agriculture and Rural Affairs	Chinese fertilizer implementation standard	https://www.163.com/dy/article/GDJC0BVN0537393M.html	Public Website
31.	People's Government of Liaoning Province	Implementation Opinions	Opinions of the General Office of Liaoning ProvincialPeople's Government on Accelerating the Utilization of Livestock and Poultry Breeding Wastes as resources https://www.ln.gov.cn/web/zwgkx/zfwj/szfwj/2023n/2023101714554651411/index.shtml	Public Website
32.	National Development and Reform Commission and Ministry of Construction	Economic Evaluation Method and Parameter of Construction Projects	Version 03	Public Website
33.	Ministry of Ecology and Environment of the People's Republic of China	Baseline emission factor of China	2019 China regional power grid carbon dioxide baseline emission factor OM calculation instructions http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/202012/t20201229_815386.shtml	Public Website
34.	IPCC	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories	Public Website

35.	IPCC	IPCC Fifth Assessment Report	IPCC Fifth Assessment Report	Public Website
36.	UNFCCC	Standard of Sampling and surveys	Standard of "Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)"	UNFCCC website
37.	UNFCCC	Guideline of Sampling and surveys	Guideline of the "Sampling and surveys for CDM project activities and programmes of activities (Version 04.0)"	UNFCCC website
38.	UNFCCC	CDM Approved Methodology ACM0010	"GHG emission reductions from Manure management systems" (Version 08.0)	UNFCCC website
39.	UNFCCC	Methodological tool 02	Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)	UNFCCC website
40.	UNFCCC	Methodological tool 05	Baseline, project and/or leakage emissions from electricity consumption and monitoring of power generation (Version 3.0)	UNFCCC website
41.	UNFCCC	Methodological tool 06	Project emissions from flaring (Version 04.0)	UNFCCC website
42.	UNFCCC	Methodological tool 08	Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 03.0)	UNFCCC website
43.	UNFCCC	Methodological tool 14	Project and leakage emissions from anaerobic digesters (Version 02.0)	UNFCCC website
44.	UNFCCC	Methodological tool 24	Common practice (Version 03.1)	UNFCCC website

45.	UNFCCC	Methodological tool 27	Investment analysis (version 12.0)	UNFCCC website
46.	GS	GS4GG PDD template	Gold Standard for the Global Goals Key Project Information & Project DesignDocument(PDD) Template, version 1.2, 14/10/2020	GS Website
47.	GS	Gold Standard for the Global Goals Principles and Requirements	Version 1.2	GS Website
48.	GS	Gold Standard forthe Global Goals Safeguarding Principles & Requirements	Version 1.2	GS Website
49.	GS	Gold Standard for the Global Goals Community Services Activity Requirements	Version 1.2	GS Website
50.	GS	Gold Standard for the Global Goals Stakeholder Consultation and Engagement Requirements	Version 1.2	GS Website
51.	GS	GS4GG GHG Emissions Reduction & Sequestration Product Requirements	Version 2.1	GS Website
52.	NDRC and the ministry of housing and urban-rural development of PRC	Notice on adjusting financial benchmark rate	Notice on adjusting financial benchmark rate of return of construction projects in some industries dated -15-March-2013	Website
53.	National Standard	GJJ/T54-93	Design code for wastewater stabilization ponds	Public Website
54.	National Development and Reform Commission and Ministry of Construction	Economic Evaluation Method and Parameter of Construction Projects	Version 03	Public Website

55.	National Development and Reform Commission	Financial benchmark rate	"Financial benchmark rate of return of construction projects" https://www.ndrc.gov.cn/fggz/gdzctz/tzfg/201907/W020191104862129391071.pdf	Public Website
56.	Ministry of Ecology and Environment of China	China cap & trade scheme	http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html	Public Website
57.	Ministry of Ecology and Environment of China	Enforced company list	http://mee.gov.cn/xxgk2018/xxgk/xxgk03/202012/W020201230736907682380.pdf	Public Website
58.	ILO	ILO conventions	https://www.ilo.org/global/lang--en/index.htm	Public Website
59.	State Institution	National Enterprise Credit Information Publicity System	http://www.gsxt.gov.cn/	Public Website
60.	State Council of China	Public information of the project owner	http://www.zhengbang.com/	Public Website
61.	Nanyang Meteorological Bureau	Public information of local temperature	http://ha.cma.gov.cn/nanyang/	Public Website
62.	Public Website	Price index of investment in fixed asset	http://www.stats.gov.cn/	Public Website
63.	Public Website	Local DRC of Liaoning province website	https://fgw.ln.gov.cn/	Public Website
64.	Peoples Republic of China	Environmental Protection Law of the People's Republic of China	Environmental Protection Law of the People's Republic of China -- china.org.cn	Public Website

65.	VVB	Site Visit Photo	Photo taken by validator during site visit including main equipment, swine farms, monitoring devices, etc.- 20/06/2023.	N/A
66.	Ministry of Agriculture and Rural Affairs of China	Specifications for the construction of manure resource utilization facilities for large-scale livestock and poultry farms (for trial implementation)	http://www.moa.gov.cn/gk/tzgg_1/tfw/201801/t20180111_6134801.htm	Public Website
67.	National Standard	GB-T 36195	Technical specification for sanitation treatment of livestock and poultry manure https://oss.baigongbao.com/2020/12/14/MRyhTKQcWC.pdf	Public Website
68.	Peoples Republic of China	Administrative Licensing Law of the People's Republic of China	Administrative Licensing Law of the People's Republic of China	Public Website
69.	China State Council	Regulations on Prevention and Control of Pollution from Livestock and Poultry Farming	http://politics.people.com.cn/n/2013/1126/c1001-23662445.html	Public Website
70.	General Office of Ministry of Agriculture and Rural Affairs General Office of Ministry of Ecology and Environment	Notice on the Issuance of Technical Guidelines for the Construction of Manure Treatment Facilities for Livestock and Poultry Farms (Households) (Nongbanmu [2022] No. 19)	https://baijiahao.baidu.com/s?id=1742546891080217587&wfr=spider&for=pc	Public Website
71.	National Data from National Bureau of Statistics of China	Average Wage of Staff and Workers and Related Indices	http://data.stats.gov.cn/easyquery.htm?cn=C01	Public website
72.	State Council of the PRC	Value Added Tax	Provisional Regulations of the People's Republic of China on Value Added Tax issued on 01/01/2019	Public website
73.	Ministry of Ecology and Environment, Peoples Republic of China	Law of the People's Republic of China on Environmental Impact Assessment	Law of the People's Republic of China on Environmental Impact Assessment	Publicly available

74.	Standing Committee of the 13th National People's Congress	Law of City Maintenance	Law of the People's Republic of China on City Maintenance and Construction Tax (Draft)	Public website
75.	Public Website	Public literature	http://www.xml-data.org/STYNCHJXB/html/2019/1/20190114.htm	Public website
76.	PP	Power of attorney for development and sales of emission reduction rights	Power of attorney between Jintai Yangxiang and Henan Yangxiang	Public website
77.	General Office of Ministry of Agriculture and Rural Affairs and Ministry of Ecology and Environment	Notice on Strengthening the Resource Utilization Plan and Ledger Management of Livestock and Poultry Manure	Issued on 24/11/2021	Public website
78.	Study	Major technologies for the utilization of livestock and poultry waste resources in sub-scale livestock farms	https://www.sohu.com/a/608556167_121118715	Public website
79	PP	Operation and maintenance contract with Weifang Kangcheng Environmental Protection Engineering Co., Ltd.	06/01/2022	PP
80	GS	validation and verification standard	Version 1	GS Website
81	PP	Power of attorney for development and sales rights of emission of reduction rights	30/12/2021	PP
82	PP	Design and implementation plan of 400t/day- waste treatment project		PP

Appendix 4.Clarification requests, corrective action requests and forward action requests

Table 1.CARs from this validation

CAR ID	01	Section no.	PDD	Date: 07/07/2023
Description of CAR				
1.PP is requested to use the latest version of PDD template. 2.The name of PP is not consistent with the documents provided and that in the GS website. Please make it consistent throughout the PDD also. 3.PP is requested to revise the PD (HDPE covered anaerobic lagoon as the anaerobic digester), so as to be consistent with the actual scenario				
Project participant response				**Date: 25/08/2023**
1.PP has been updated according to the latest PDD template（v.1.3）, please review the updated submitted PDD. *2.The name of PP is Henan Yangxiang Breeding Co., Ltd. (referred to as Henan Yangxiang), the name of PO is Xinmin Jintai Yangxiang Agriculture and Animal Husbandry Co. Ltd. (referred to as Jintai Yangxiang), PP has unified the PP's and PO's name in related documents and PDD, please review.* *3.At the beginning of the project construction, it was originally planned to use HDPE covered anaerobic lagoon as the anaerobic digester. However, the more efficient UASB was chosen as the anaerobic digester during actual construction. The chapter A.3 Technologies and/or measures of PD has been modified according to the actual scenario, the description of HDPE covered anaerobic lagoon has been revised to UASB in the description of Anaerobic digestion process. Please review.*				
Documentation provided by project participant				

Business licenses; *Equipment and civil construction contracts;* *Attribution of emission reductions_Clique.*
VVB assessment **Date: 27/08/2023**
PP has revised the PD as mentioned above and the justification provided by the PP is acceptable to the VVB. Hence, CAR 01 is closed.

CAR ID	**02**	**Section no.**	**IRR**	**Date: 07/07/2023**
Description of CAR				
1.In IRR sheet, the input parameters should be linked to calculations rather than punching directly. Also, PP is requested to clarify why the price of coal is demonstrated in the parameter source of IRR sheet.				
Project participant response				**Date: 25/08/2023**
1.The IRR sheet has been updated, and the input parameters has been linked to calculations, please review the resubmitted IRR sheet. *The source of the price of coal is China Coal Industry Association: 2021 Coal Industry Development Annual Report. The price of coal is 648 RMB/t. The data sources are linked as below:* *https://www.sgpjbg.com/info/32115.html#:~:text=%E4%BA%A7%E9%87%8F%E6%96%B9%E9%9D%A2%EF%BC%8C%E5%B9%B4%E6%8A%A5%E6%95%B0,023.1%E4%BA%BF%E5%85%83%E3%80%82* **4. 煤炭价格。一是煤炭中长期合同制度彰显稳价作用。**2021 年动力煤中长期合同（5500 大卡下水煤）全年均价为 648 元/吨，同比上涨 105 元/吨，保持相对稳定，发挥了保供稳价“压舱石”作用。**二是煤炭市场现货价格出现深幅波动。**2 月末北方港口 5500 大卡动力煤价格为 571 元/吨，二季度以后价格呈现高位波动，年内价格峰谷差达到 1900 元/吨左右；随着增产增供稳价政策措施效果显现，年末市场供需形势持续好转，动力煤期货主力合约和秦皇岛港 5500 大卡动 9 *Please check the “Parameter source” sheet in IRR.*				
Documentation provided by project participant				
-				
VVB assessment				**Date: 27/08/2023**
IRR has been updated. PP is requested to clarify, why the coal related details has been mentioned in the IRR calculation sheet. Hence, CAR 02 is open.				
Project participant response				**Date: 10/10/2023**
The biogas produced by the anaerobic digestion replaces coal as the fuel for boiler combustion, saving the cost of purchasing coal. In the IRR sheet, the amount of biogas produced and the calorific value ratio of the two fuels can be used to calculate the amount of coal that biogas replaces. The product of coal use and the price of coal per ton is the cost of coal purchase saved. *Please review.*				
Documentation provided by project participant				
IRR sheet				
VVB assessment				**Date: Date: 20/10/2023**
Justification provided by the PP is found to be appropriate and acceptable to the VVB. Hence, CAR 02 is closed.				

CAR ID	03	Section no.	A	Date: 07/07/2023

Description of CAR

1.In section A of the PDD, the baseline scenario is not clearly mentioned. PP is requested to correct the same.

2.In section A of the PDD, the location mentioned has to be specific. PP is requested to correct the same.

3.PP is requested to mention when the project is implemented and started its operation in section A.1.1 (a) of the PDD.

4.PP is requested to provide the details of EIA approval in section A.1.1 (d) of the PDD.

Project participant response — **Date: 25/08/2023**

*1.The description of the baseline scenario has been added to section A.1 of the PDD. The baseline scenario is an uncovered anaerobic lagoon with L*B*H=50m*194m*5m, and the retention time of the manure waste in uncovered anaerobic lagoon is two months. The methane produced by the anaerobic reaction is emitted to the atmosphere directly without any methane recovery and destruction facility. Please review.*

2.The specific location of the proposed project has been added to section A.1.1 (b) of the PDD. The proposed project is located in Sunjiatun Village, Xinnongcun Township, Xinmin city, Liaoning Province (42°13'25.60"N 122°51'52.39"E), please review.

3.The operation time of the proposed project is 01/03/2022. The description of the operation time has been added to section A.1.1 (a) of the PDD, please review.

4.Xinmin City Environmental Protection Bureau issued the EIA approval of Xinmin Jintai Farm on March 30, 2017, and the EIA approval document number is Xinhuanshenzi [2017]06. The description has been added to section A.1.1 (a) of the PDD, please review.

Documentation provided by project participant

PDD and IRR sheet;
Project Commissioning report and Project Commencement Report;
EIA approval.

VVB assessment — **Date: 27/08/2023**

PP has revised the section A of the PD as mentioned above the same found to be appropriate. Therefore, project verification has accepted the same. Hence CAR 03 is closed.

CAR ID	04	Section no.	B.2	Date: 07/07/2023

Description of CAR

1.Latest version of tool 6 (version 4) is available, . PP is requested to use the same.

Project participant response — **Date: 25/08/2023**

1.PP has updated tool 6 version number to the latest version in PD, the content about Tool 06 in sections B.1., B.2., and B.6 is changed to Tool 06: "Project emissions from flaring (Version 04.0)" .

Please review.

a

-

VVB assessment — **Date: 27/08/2023**

Applicability conditions of tool 6 (version 4) is not fully demonstrated, PP is requested to demonstrate the same and provide the response according to it. Hence, CAR 04 is open.

Project participant response — **Date: 10/10/2023**

In section B.2, it is added that the unused biogas of this project is flared by closed flare, and Tool 06 is suitable for calculating the combustion emissions of biogas from the closed flare.

The flare used in the proposed project is a closed flare, and manufacture specification of the flare as follow:

Model	Operating temperature	Flow rate
M hj-300 m^3	600~1000°C	60~300 m^3/h (61~336 Nm^3/h)

Documentation provided by project participant

-

VVB assessment | **Date: 20/10/2023**

PP has revised the section B.2 as per the request and the same found to be appropriate. Hence, CAR 04 is closed.

CAR ID	**05**	**Section no.**	**B.4**	**Date: 07/07/2023**

Description of CAR

1.PP is requested to describe the baseline scenario for the project activity and explain how it is established in accordance with:

- Selected methodology(ies) and
- relevant applicable legislation and how effectively these are enforced (GS4GG Principle 1). PP is requested to comply to the PDD template guide.

2.In section B.4 of the PDD, (common practice analysis) PP is requested to check and correct the values taken for calculations and use those values consistently across the document.

Project participant response | **Date: 25/08/2023**

1.The description of the baseline scenario has been added to section B.4 of the PDD.

*The baseline scenario is an uncovered anaerobic lagoon with L*B*H=50m*194m*5m, and the retention time of the manure waste in uncovered anaerobic lagoon is two months. The methane produced by the anaerobic reaction is emitted to the atmosphere directly without any methane recovery and destruction facility. Baseline scenario has been identified using the methodological Tool 02 "Combined tool to identify the baseline scenario and demonstrate additionality (Version07.0)", considering the requirements of the methodology and assessing the possible waste management options as described in 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4, Chapter 10, Table 10.17) . and GOLD STANDARD FOR THE GLOBAL GOALS PRINCIPLES & REQUIREMENTS Version 1.2 (Principle 1: Contribution to Climate Security & Sustainable Development).*

Please review.

2.The values used for the calculations have been checked and corrected in Section B.4 (common practice analysis) of the PDD and used consistently throughout the document. Through searching UNFCCC website, CDM website, China CER exchange info-platform, GS website, VCS website, local DRC of Liaoning Province and other public information, only VCS 3880 is not excluded by step 2, but its status on VCS is Registration and verification approval requested, which is submitted for registration. According to the provisions of sub-step3, the item submitted for registration is excluded by this step, so Nall is 0. Please review.

Documentation provided by project participant

-

VVB assessment | **Date: 27/08/2023**

Baseline scenario is to be demonstrated as per the requirement, and the steps of additionality should be demonstrated in the additionality section. Kindly correct the same. Hence CAR 05 is open.

Project participant response	Date: 10/10/2023
PP has added the investment analysis results of the uncovered anaerobic lagoon (baseline). This indicates that the cost of the project activity without GS VER revenues is much higher than that of the uncovered anaerobic lagoon. So, the uncovered anaerobic lagoon is the most attractive course of action and is considered to be the baseline scenario. *PP has adjusted the common practice analysis to Section B.5 Demonstration of additionality , the values used for the calculations have been checked and corrected in Section B.5 (common practice analysis) of the PDD and used consistently throughout the document.*	
Documentation provided by project participant	
-	
VVB assessment	**Date: 20/10/2023**
Justification provided by the PP is found to be appropriate and acceptable to the VVB. Hence, CAR 05 is closed.	

CAR ID	06	Section no.	B.6.1 of PDD	Date: 07/07/2023
Description of CL				
1.The values of baseline emission, project emission, leakage emission are not consistent with ER sheet. PP is requested to use the same pattern to demonstrate the calculation of emissions in both the ER sheet and PDD.				
PP response				**Date: 25/08/2023**
1.PP has modified the values in baseline emission, project emission, leakage emission and ER sheet to be consistent. Please review.				
Documentation provided by PP				
ER sheet.				
VVB assessment				**Date: 27/08/2023**
PP has revised the PD and ER sheet as mentioned above, the values are now consistent in all documents the same is fund to be appropriate. Hence, CAR 06 is closed.				

CAR ID	07	Section no.	B.6.2 of PDD	Date: 07/07/2023
Description of CL				
2.PP is requested to check and correct the value and unit used for Universal ideal gases constant in section B.6.2. 3.In section B.6.2, provide source of data and measurement procedures for Fraction of volatile solids directed to aerobic treatment. 4.In B.6.2 Data and parameters fixed ex ante, no unit is used for MCFj. PP is requested to correct the same.				
PP response				**Date: 25/08/2023**
2.PP has corrected the value and unit used for Universal ideal gases constant in section B.6.2, change the unit of parameter "D_{CH4}" to "t/m^3" , change the unit of parameter "F_{gasm}" to "$(kg\ NH_3–N + NO_x–N)/(kg\ N\ applied)^{-1}$", the liquid $MS\%_{Bl,j}$=22.8%, the solid $MS\%_{Bl,j}$=77.2%, please review. *3.There is no condition for monitoring Fraction of volatile solids directed to aerobic treatment, according to the conservative principle, use the maximum value of 100%, PP has provided source of data and measurement procedures in section B.6.2, the source of data is project evaluation report, the measurement procedures is to use the maximum value according to the conservative principle. Please review.* *PP has corrected the unit of MCF_j in B.6.2, change the unit of parameter "MCF_j" to "-", please*				

review.

Documentation provided by PP

VVB assessment	**Date: 27/08/2023**

PP has provided the source of data and measurement procedures for Fraction of volatile solids directed to aerobic treatment.

1. The value and the unit are not correct for Universal ideal gases constant in section B.6.2.
2. The unit column of for MCFj is blank, PP is requested to fill the same and further PP is requested fill all the columns in the table of the section B.6.2 of the PD. Hence CAR 07 is open.

Project participant response	**Date: 10/10/2023**

1.PP has corrected the value and unit used for Universal ideal gases constant in section B.6.2, according to Methodology ACM0010(version 08.0) Data / Parameter table 11. on page 30, the unit of "D_{CH4}" to "t/m^3", please review.

Data / Parameter table 11.

Data / Parameter:	**D_{CH4}**
Data unit:	t/m^3
Description:	Density of CH_4
Source of data:	Technical literature
Measurement procedures (if any):	-
Any comment:	0.00067 t/m^3 at room temperature 20°C and 1 atm pressure

2.PP has corrected the unit of MCF_j in B.6.2, according to Methodology ACM0010(version 08.0) Data / Parameter table 13. on page 30, the unit of " MCFj " is "-", please review.

Data / Parameter table 13.

Data / Parameter:	**MCF_j**
Data unit:	-
Description:	Methane conversion factor for the baseline $AWMS_j$
Source of data:	IPCC 2006 table 10.17, chapter 10, volume 4 (see appendix 3)
Measurement procedures (if any):	-

Documentation provided by project participant

-

VVB assessment	**Date: 20/10/2023**

PP has revised the section B.6.2 of the PDD as mentioned above the same found to be appropriate and acceptable by the VVB. Hence, CAR 07 is closed.

Table 2.CLs from this validation

CL ID	**01**	**Section no.**	**PDD**	**Date: 07/07/2023**
Description of CL				

1.PP is requested to provide evidence for the estimated sustainable development contributions mentioned in the PDD.

2.PP is requested to provide the business license (of “Henan Yangxiang Livestock Breeding Co., Ltd.”)

Project participant response	**Date: 25/08/2023**

1.PP has provided employment contract, operation record of organic Fertilizer workshop, Organic fertilizer is distributed free of charge as the evidence for the estimated sustainable development contributions mentioned in the PDD. Please review.

2.PP has provided the business license (of “Henan Yangxiang Livestock Breeding Co., Ltd.”) . Please review.

Documentation provided by project participant

Operation record;
Employment contract;
Organic fertilizer workshop;
Free distribution of organic fertilizer announcements;
Business license.

VVB assessment	**Date: 27/08/2023**

PP has provided all the above-mentioned documents, the same found to be appropriate and acceptable by the verification body. Hence, CL 01 is closed.

CL ID	**02**	**Section no.**	**PDD**	**Date: 07/07/2023**

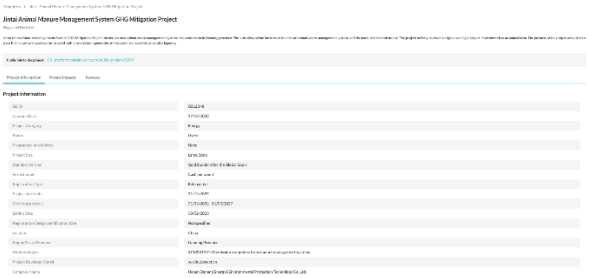
Description of CL

1.PP is requested to provide evidence for listing of the project activity with Gold Standard.

2.PP is requested to provide supportive documents for the online board meeting regarding the project implementation with Gold Standard.

Project participant response	**Date: 25/08/2023**

1.PP has provided the project activity listing screenshot as the evidence. Please review.



2.PP has provided the board meeting resolution as the supportive documents for the online board meeting regarding the project implementation with Gold Standard . Please review.

Documentation provided by project participant

Screen shot of project listing;
The board meeting resolution.

VVB assessment	**Date: 27/08/2023**

PP has provided evidence for listing of the project activity and board meeting resolution. the same found to be appropriate and acceptable by the verification body. Hence, CL 02 is closed.

CL ID	**03**	**Section no.**	**A of PDD**	**Date: 07/07/2023**

Description of CL

1.In the project description, it's mentioned that the fertilizers are given free. But the revenue from sale of fertilizer is also considered. PP is requested to clarify how revenue from the same is possible. Please make it consistent across the document.
Project participant response **Date: 25/08/2023**
1.During the actual operation of the project, the organic fertilizers were donated to the surrounding residents free of charge, so the project cannot obtain income through the sale of organic fertilizers, which has been unified in project description. PP has completed amendments to IRR. PP has provided the Organic fertilizer is distributed free of charge as the evidence. Please review.
Documentation provided by project participant
-
VVB assessment **Date: 27/08/2023**
Organic fertilizer is distributed free of charge, the evidence of same is submitted and revised across the PD and found to be appropriate. Hence, CL 03 is closed.

CL ID	**04**	**Section no.**	**B.2 of PDD**	**Date: 07/07/2023**
Description of CL				
1.In auxiliary energy consumption details, PP is requested to clarify why they don't use the actual consumption data during the crediting period				
Project participant response				**Date: 25/08/2023**
1.The anaerobic digestion system does not use a separate meter to measure its electricity consumption, the electricity consumption that is related to the anaerobic digester cannot be separated from the total electricity consumption, the actual consumption data cannot be obtained. Therefore, the emission for consumption of electricity is consumption calculated according to the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation". Please review.				
Documentation provided by project participant				
-				
VVB assessment				**Date: 27/08/2023**
It is to be noted that value of ECPJ,j,y 3724 and the same is sourced from project design scheme, PP is requested to provide the same and demonstrate the value is conservative. Hence CL 04 is open.				
Project participant response				**Date: 10/10/2023**

The anaerobic digestion system does not use a separate meter to measure its electricity consumption, the electricity consumption that is related to the anaerobic digester cannot be separated from the total electricity consumption, the actual consumption data cannot be obtained. Therefore, the emission for consumption of electricity is consumption calculated according to Methodology ACM0010(version 08.0) Section 5.4.4, paragraph 48, "In case, the electricity consumption is not measured then the electricity consumption shall be estimated as follows $EC_{P,J,y}=\sum_i CP_{i,y}\times 8760$*, where* $CP_{i,y}$ *is the rated capacity (in MW) of electrical equipment i used for the project activity".*

According to Project Evaluation Report& Detailed project report, page 42, The total installed capacity of the first phase of the project (swine on hand: 16,000) is 141.7kw.

第九章　电器仪表、给排水、消防及分析化验

一、电器仪表

（1）本工程电源由厂配电房将 380/220 伏三相四线制引入控制室内，经控制室内总配电柜供各用电点,各供电点设有单独控制箱。

（2）总配电柜上安装有电压表、电流表和电度表，以监测整个处理装置的用电情况。

（3）动力设备均采用三相 380V 供电，照明采用单相 220V 供电。

（4）整个污水处理站用电设备 31 台，总装机容量 141.7KW，常用容量 78.3KW。

二、给排水

污水处理厂自用水包括化验室、生活用水，及绿化、冲刷用水。化验及生活用水采用自来水，直接接自服务区给水管网，水压大于 0.2Mpa,排水均排入调节池内,纳入废水处理系统内。绿化冲刷用水可直接采用污水处理系统出口，有效

*Therefore, the total installed capacity of the project after completion (swine on hand: 48,000) is 141.7*3= 425.1kw, the electricity consumption* $EC_{P,J,y}$*= =425.1/1000*8760=3724MWh/yr. So* $EC_{P,J,y}$ *=3724MWh/yr is a conservative value.*

PP has supplemented the data source and calculation process on page 92 of project design.

Please review.

Documentation provided by project participant	
-	
VVB assessment	**Date: 20/10/2023**
Justification provided by the PP is found to be appropriate and acceptable to the VVB. Hence, CL 04 is closed.	

CL ID	**05**	**Section no.**	**B.3 of PDD**	**Date: 07/07/2023**
Description of CL				
1.PP is requested to justify why the CO_2 emissions from the decomposition of organic wastes are not accounted. 2.PP is requested to clarify why the emission from flaring or combustion of the gas stream is not considered in				

the project boundary.

3.In the flow chart, it is mentioned that produced biogas will be used for power generation and flaring. The same is not mentioned in the description of the project. Further, in section A.3, under comprehensive utilization of biogas process, it is mentioned that biogas is used for heating and power supply. PP is requested to clarify what exactly the biogas is used for. And make the details consistent across the PDD.

PP response	**Date: 25/08/2023**

1.Accroading to the approved methodology, which applied by this project, ACM0010" GHG emission reductions from manure management systems (Version 08.0)", Table 2. Emissions sources included in or excluded from the project boundary, CO_2 emissions from the decomposition of organic wastes are not accounted. Please review.

ACM0010
Large-scale Consolidated Methodology: GHG emission reductions from manure management systems
Version 08.0 .
Sectoral scope(s): 13 and 15

Table 2. Emissions sources included in or excluded from the project boundary

	Source	Gas	Included	Justification/Explanation
Baseline	Emissions from the waste treatment processes	CH_4	Yes	The major source of emissions in the baseline
		N_2O	Yes	Direct and indirect N_2O emissions are accounted
		CO_2	No	CO_2 emissions from the decomposition of organic waste are not accounted
	Emissions from electricity consumption/ generation	CO_2	Yes	Electricity may be consumed from the grid or generated onsite in the baseline scenario
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This is conservative
	Emissions from thermal energy generation	CO_2	Yes	If thermal energy generation is included in the project activity
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This is conservative
Project activity	Emissions from thermal energy use	CO_2	Yes	May be an important emission source
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from on-site electricity use	CO_2	Yes	May be an important emission source. If electricity is generated from collected biogas, these emissions are not accounted for
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from the waste treatment processes	N_2O	Yes	Direct and indirect N_2O emissions are accounted
		CO_2	No	CO_2 emissions from the decomposition of organic waste are not accounted
		CH_4	Yes	The emission from anaerobic digesters and aerobic treatment

2.In Ex-Ante estimation, it is assumed that all the collected biogas is used to provide hot water, and no biogas is burned by the flare, so the emission from flaring or combustion of the gas stream is not considered in the project boundary. Please review.

3.Before the construction of the project, it was originally intended to use the biogas generated by the anaerobic digestion for power generation. However, in the actual operation process, the biogas generator has not been put into use. The biogas is only used for short-term ignition during the annual equipment inspection, and it has been determined whether the equipment is in good condition. The biogas generated during the treatment process will be captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas. The relevant expressions have been unified in the project design document. PP has made the details consistent across the PDD, please review.

Documentation provided by PP

VVB assessment	**Date: 27/08/2023**

The justification provided by the PP is found to be appropriate and acceptable. Further PP has revised the utilization of biogas as per the actual scenario and the same is consistent across the PD. Hence, CL 05 is closed.

CL ID	06	Section no.	B.4 of PDD	Date: 07/07/2023

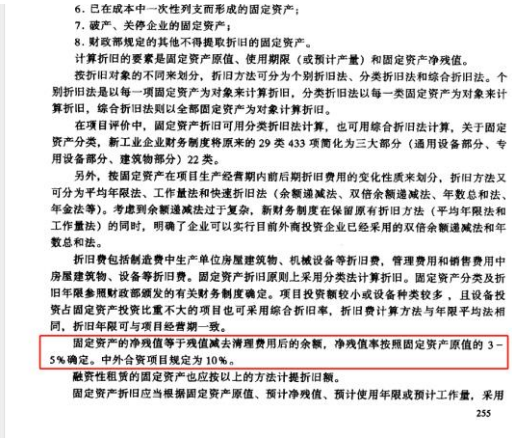
Description of CL

1.PP is requested to provide all the input parameters used for the calculation along with the supportive documents and their sources. Viz., income tax rate, electricity generation details, depreciation. Further PP is requested to confirm that the sourced parameters are valid at the time of investment decision date.

PP response | **Date: 25/08/2023**

1.During the actual operation of the proposed project, biogas is no longer used for power generation, and the organic fertilizers were donated to the surrounding residents free of charge, so the project cannot obtain income through the generate electricity, sale of organic fertilizers. The project does not involve income tax rate and power generation.

The source of ending residual rate is page 255 of the "Guidelines for Economic Consultation and Evaluation of Investment Projects". The screenshot is as follows:



6. 已在成本中一次性列支而形成的固定资产；
7. 破产、关停企业的固定资产；
8. 财政部规定的其他不得提取折旧的固定资产。

计算折旧的要素是固定资产原值、使用期限（或预计产量）和固定资产净残值。

按折旧对象的不同来划分，折旧方法可分为个别折旧法、分类折旧法和综合折旧法。个别折旧法是以每一项固定资产为对象来计算折旧，分类折旧法以每一类固定资产为对象来计算折旧，综合折旧法则以全部固定资产为对象计算折旧。

在项目评价中，固定资产折旧可用分类折旧法计算，也可用综合折旧法计算。关于固定资产分类，新工业企业财务制度将原来的 29 类 433 项简化为三大部分（通用设备部分、专用设备部分、建筑物部分）22 类。

另外，按固定资产在项目生产经营期内前后期折旧费用的变化性质来划分，折旧方法又可分为平均年限法、工作量法和快速折旧法（余额递减法、双倍余额递减法、年数总和法、年金法等）。考虑到余额递减法过于复杂，新财务制度在保留原有折旧方法（平均年限法和工作量法）的同时，明确了企业可以实行目前外商投资企业已经采用的双倍余额递减法和年数总和法。

折旧费包括制造费中生产单位房屋建筑物、机械设备等折旧费，管理费用和销售费用中房屋建筑物、设备等折旧费。固定资产折旧原则上采用分类法计算折旧。固定资产分类及折旧年限参照财政部颁发的有关财务制度确定。项目投资额较小或设备种类较多，且设备投资占固定资产投资比重不大的项目也可采用综合折旧率，折旧费计算方法与年限平均法相同，折旧年限可与项目经营期一致。

固定资产的净残值等于残值减去清理费用后的余额，净残值率按照固定资产原值的 3－5%确定。中外合资项目规定为 10%。

融资性租赁的固定资产也应按以上的方法计提折旧额。

固定资产折旧应当根据固定资产原值、预计净残值、预计使用年限或预计工作量，采用

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The depreciation rate is calculated by (1- ending residual rate)/period of depreciation.

Documentation provided by PP

VVB assessment | **Date: 27/08/2023**

In sub-step 3C of the PD, PP is requested to is requested to provide all the input parameters used for the calculation along with the supportive documents and their sources at the time of investment decision date not the actual one. Further PP is requested to provide actual documents for all input parameters to validate. Some of the documents which has been shared are marked with black bar, to validate all the parameters kindly provide the clear document. Hence CL 06 is open.

PP response | **Date: 10/10/2023**

The data source of "Total static investment" is Jintai Yangxiang's FSR page 69.

小 计				**212**	
五、猪粪、污水处理					
1.污水池(钢筋混泥土结构)	m^3	10000	70	210	
2.除臭抽风除臭系统	套	6	200000	120	
3.舍内排风、降温系统		6	10000	18	水帘 1800 m^2 排风机 180 台
4.粪水分离器（绞龙、传送）	套			131	
5.排污暗沟	m	120	1750	21	
6.刮粪板	套	19400	50	97	三栋舍
5.粪便发酵池（砖、水泥沙）	m^3			64	100m×50m×3m
6..猪粪烘干设施		1940	500	97	
7.猪粪烘干房	m^2	10000	70	210	
小 计				**759**	
六、种猪					
1.二元基础母猪	头			9000	
2.种母猪和种公猪	头	10000	3000	242	
小 计		291	8299	**9241.5009**	
固定资产总计				**34487**	建设投资：14197 万元

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The data source of "O&M cost" is Jintai Yangxiang's FSR page 71.

附表 3：总成本费用估算表

（单位：万元）

序号	项 目	2	3	4	5	6	7	8	9	10	11 月 12 日
1	主要原、辅材料	9553.5	16664.7	16664.7	16664.7	16664.7	16664.7	16664.7	16664.7	16664.7	16664.7
2	燃料、动力	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050
3	摊销费	0	46.875	46.875	46.875	46.875	0	0	0	0	0
4	工资及附	981	981	981	981	981	981	981	981	981	981
5	维护费	150	150	150	150	150	150	150	150	150	150
6	折旧费	3411.75	3411.75	3411.75	3411.75	3411.75	3411.75	3411.75	3411.75	3411.75	3411.75
7	管理费用	981	981	981	981	981	981	981	981	981	981
运维费用合计（5-7）		5523.75	5523.75	5523.75	5523.75	5523.75	5523.75	5523.75	5523.75	5523.75	5523.75
其中（粪污处理运维）		196.57	196.57	196.57	196.57	196.57	196.57	196.57	196.57	196.57	196.57
8	销售费用	300	691.5	691.5	691.5	691.5	691.5	691.5	691.5	691.5	691.5
9	财务费用	517.5	642	0	0	0	0	0	0	0	0
总成本		16944.75	24571.95	23976.825	23976.825	23976.825	23929.95	23929.95	23929.95	23929.95	23929.95
固定成本		6341.25	6857.25	6262.125	6262.125	6262.125	6215.25	6215.25	6215.25	6215.25	6215.25
可变成本		10603.5	17714.7	17714.7	17714.7	17714.7	17714.7	17714.7	17714.7	17714.7	17714.7
经营成本		12715.5	19826.7	19826.7	19826.7	19826.7	19826.7	19826.7	19826.7	19826.7	19826.7

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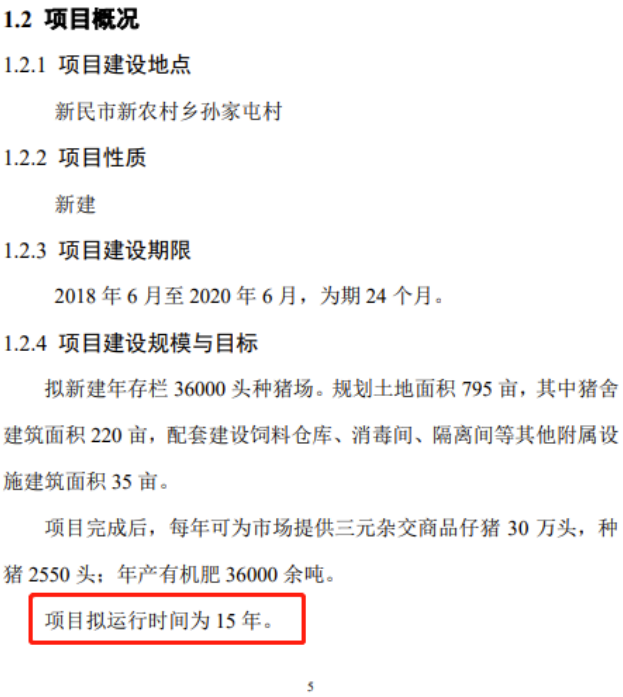
The data source of "Operation period" is Jintai Yangxiang's FSR page 5.



1.2 项目概况

1.2.1 项目建设地点

新民市新农村乡孙家屯村

1.2.2 项目性质

新建

1.2.3 项目建设期限

2018 年 6 月至 2020 年 6 月，为期 24 个月。

1.2.4 项目建设规模与目标

拟新建年存栏 36000 头种猪场。规划土地面积 795 亩，其中猪舍建筑面积 220 亩，配套建设饲料仓库、消毒间、隔离间等其他附属设施建筑面积 35 亩。

项目完成后，每年可为市场提供三元杂交商品仔猪 30 万头，种猪 2550 头；年产有机肥 36000 余吨。

项目拟运行时间为 15 年。

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Please review.

Documentation provided by PP

VVB assessment	**Date: 20/10/2023**
The document and justification provided by the PP is found to be appropriate and acceptable to the VVB. Hence, CL 06 is closed.	

CL ID	**07**	**Section no.**	**B.6 of PDD**	**Date: 07/07/2023**
Description of CL				
1.Supporting documents to be provided FOR gender discrimination related to the project activity. 2.In SDG parameter 8; The supporting documents is to be provided for the minoring of number of males and females employed by the project activity and the average monthly salary.				
PP response				**Date: 25/08/2023**
1.PP has provided the Yangxiang recruitment information, Yangxiang's website news about International Working Women's Day as the supporting document for gender discrimination related to the project activity. *2.PP has provided the staff employment contract as the supporting document for the number of males and females employed and the average monthly salary.*				
Documentation provided by PP				
VVB assessment				**Date: 27/08/2023**
PP has provided Yangxiang recruitment information, Yangxiang's website news about International Working Women's Day, staff employment contract, the same found to be appropriate and acceptable. Hence, CL 07 is closed.				

CL ID	**08**	**Section no.**	**B.6.1 of PDD**	**Date: 07/07/2023**
Description of CL				
1.PP is requested to provide evidence for the annual average number of animals of type LT for the				

year y (number)

2.Regarding the Quantification of electricity consumption associated with the anaerobic digester, PP is requested to provide the evidence for calibration of electricity meters and its frequency. Also, PP is requested to clarify why they don't use the actual consumption data during the crediting period, as well as the calibration frequency.

3.Supporting documents is to be provided for the default factor for the electricity consumption associated with the anaerobic digester per ton of CH_4 generated.

PP response	**Date: 25/08/2023**

1.PP has provided the Weight list (swine entering and exiting the slaughter house weighing list) as evidence of annual average number of animals of type LT for the year y (number). Please review.

2.The anaerobic digestion system does not use a separate meter to measure its electricity consumption, the electricity consumption that is related to the anaerobic digester cannot be separated from the total electricity consumption, the actual consumption data cannot be obtained. Therefore, the emission for consumption of electricity is consumption calculated according to the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation".

3.*Before the construction of the project, it was originally intended to use the biogas generated by the anaerobic digestion for power generation. However, in the actual operation process, the biogas generator has not been put into use. The biogas is only used for short-term ignition during the annual equipment inspection, and it has been determined whether the equipment is in good condition. The biogas generated during the treatment process will be captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas. The relevant expressions have been unified in the project design document. PP has made the details consistent across the PDD, please review.*

Documentation provided by PP

VVB assessment	**Date: 27/08/2023**

It is to be noted that value of ECPJ,j,y 3724 has been used for the calculation and the same is sourced from project design scheme, PP is requested to provide the same and demonstrate the value is conservative. Hence CL 08 is open.

PP response	**Date: 10/10/2023**

The emission for consumption of electricity is consumption calculated according to Methodology ACM0010(version 08.0) Section 5.4.4, paragraph 48, "In case, the electricity consumption is not measured then the electricity consumption shall be estimated as follows $EC_{P,J,y}=\sum_i CP_{i,y}\times 8760$*, where* $CP_{i,y}$ *is the rated capacity (in MW) of electrical equipment i used for the project activity".*

*According to Project Evaluation Report& Detailed project report, page 42, The total installed capacity of the first phase of the project (swine on hand: 16,000) is 141.7kw. Therefore, the total installed capacity of the project after completion (swine on hand: 48,000) is 141.7*3= 425.1kw, the electricity consumption* $EC_{P,J,y}$*= =425.1/1000*8760=3724MWh/yr. So* $EC_{P,J,y}$ *=3724MWh/yr is a conservative value.*

PP has supplemented the data source and calculation process on page 92 of project design. Please review.

Documentation provided by PP

VVB assessment	**Date: 20/10/2023**

Justification and document provided by the PP is found to be appropriate and acceptable to the VVB. Hence, CL 08 is closed.

CL ID	**09**	**Section no.**	**B.6.2 of PDD**	**Date: 07/07/2023**

Description of CL	
1.PP is requested to justify in the conclusion why option 4 is not used in the Estimation of VSLT,y , baseline emission of B.6.2	
PP response	**Date: 25/08/2023**
1.According to section 5.3.2.1 of ACM0010, $VS_{LT,y}$ shall be determined in one of the following ways, presented in the order of preference. Option 3 is adopted to calculate $VS_{LT,y}$, which has priority over Option 4, Option 4 is not taken.	
Documentation provided by PP	
VVB assessment	**Date: 27/08/2023**
PP has revised the conclusion in the PD as mentioned above and found to be appropriate. Hence, CL 09 is closed.	

CL ID	10	Section no.	B.7 of PDD	Date: 07/07/2023
Description of CL				
3.PP is requested to provide the supportive documents for all the monitoring parameters mentioned in section B.7 of the PDD, viz., food purchase records, sale records. 4.PP is requested to provide energy generation details of the 3,724 MWh electricity generated annually. 5.The information of testing institute for environmental monitoring was not provided. PP is requested to provide the original monitoring report. 6.PP is requested to clarify whether the flow meter which measure methane, is calibrated or not. Please provide the calibration frequency and the calibration records. 7.PP is requested to provide the calibration records and frequency of the electronics truck scale used at site				
PP response				**Date: 25/08/2023**
3.PP has provided the operation record of organic Fertilizer workshop, thermal monitoring records, biogas monitoring records, Weight list, Monitoring Records of Livestock Weight Sampling (Monthly Report), etc., as the supportive documents for all the monitoring parameters mentioned in section B.7 of the PDD. *4.Before the construction of the project, it was originally intended to use the biogas generated by the anaerobic digestion for power generation. However, in the actual operation process, the biogas generator has not been put into use. The biogas is only used for short-term ignition during the annual equipment inspection, and it has been determined whether the equipment is in good condition. The biogas generated during the treatment process will be captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas. The relevant expressions have been unified in the project design document.* *5.The testing institute for environmental monitoring was Shenyang Hengguang Environmental Testing Technology Co., Ltd., PP has provided the monitoring report. Please review.* *6.The flow meter which measures methane, is calibrated, and the calibration frequency of flow meter is once a year. PP has provided the calibration frequency and the calibration records. Please review.* 7.*The electronics truck scale is calibrated, and the calibration frequency of scale is once a year. PP has provided the calibration frequency and the calibration records. Please review.*				
Documentation provided by PP				
VVB assessment				**Date: 27/08/2023**
PP has provided the operation record of organic Fertilizer workshop, thermal monitoring records, biogas monitoring records, Weight list, Monitoring Records of Livestock Weight Sampling (Monthly Report), test reports, calibration reports etc as mentioned above.				

It is to be noted that value of ECPJ,j,y 3724 has been used for the calculation and the same is sourced from project design scheme, PP is requested to provide the same and demonstrate the value is conservative. Hence, CL 10 is open.
PP response **Date: 10/10/2023**
The emission for consumption of electricity is consumption calculated according to Methodology ACM0010(version 08.0) Section 5.4.4, paragraph 48, "In case, the electricity consumption is not measured then the electricity consumption shall be estimated as follows $EC_{P,J,y}=\sum_i CP_{i,y}\times 8760$*, where* $CP_{i,y}$ *is the rated capacity (in MW) of electrical equipment i used for the project activity".* *According to Project Evaluation Report& Detailed project report, page 42, The total installed capacity of the first phase of the project (swine on hand: 16,000) is 141.7kw. Therefore, the total installed capacity of the project after completion (swine on hand: 48,000) is 141.7*3= 425.1kw, the electricity consumption* $EC_{P,J,y}$*= =425.1/1000*8760=3724MWh/yr. So* $EC_{P,J,y}$ *=3724MWh/yr is a conservative value, please review.*
Documentation provided by PP
VVB assessment **Date: 20/10/2023**
Justification provided by the PP is found to be appropriate and acceptable to the VVB. Hence, CL 10 is closed.

CL ID	**11**	**Section no.**	**E of PDD**	**Date: 07/07/2023**
Description of CL				
1.PP is requested to provide the supportive documents for LSC.				
PP response				**Date: 25/08/2023**
1.PP provides meeting invitation, meeting sign-in form, photos of stakeholders attending the meeting and stakeholder survey form as supportive documents for LSC. Please review.				
Documentation provided by PP				
VVB assessment				**Date: 27/08/2023**
PP has provided meeting invitation, meeting sign-in form, photos of stakeholders attending the meeting and stakeholder survey form for the supportive evidences for LSC, the same found to be appropriate. Hence, CL 11 is closed.				

1. FARs from this validation

Not Applicable

Appendix 5: SAFEGUARDING PRINCIPLES & REQUIREMENTS

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)	VVB Assessment
Principle 1. Human Rights				

1.The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights 2.The Project shall not discriminate with regards to participation and inclusion	No	1.The project activity is designed to introduce new animal waste management systems to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The project is in Liaoning Province, China. The project is implemented under the laws of China and will not lead to violations or human rights abuses in any kind. 2.All end-users in the project region that respect the principles and values of sustainable development can equally participate and benefit from the project. The project does not discriminate on gender, race, religion, sexual orientation or any other aspect.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative/employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

Principle 2. Gender Equality				
1.The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women 2.Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work 3.The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4.(where required) Summary of opinions and recommendations of an Expert Stakeholder(	No	1.The project will not directly or indirectly reinforce gender-based discrimination and shall not lead to/contribute to adverse impacts on gender equality and/or the situation of women. In fact, the project increases women's access to or control of resources, entitlements and benefits by providing easy access to equal job opportunities. 2.The project will not set up any barriers to the employment of women. All employees have benefits based on pregnancy, maternity/paternity leave, or	Not required	The project is designed to install new animal waste management systems to treat the manure and wastewater from the swine farms to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The validation team has observed that the project will not directly or indirectlyreinforce gender-based discrimination and shall not lead to/contribute to adverse impacts on gender equality and/or the situation of women. Besides, the validation team has verified that the project gives women moreaccesstoor controlresources, entitlementsand benefitsbyproviding easy access to equal job opportunities. Via checking the labour contracts/26/, it is verified that project did not set up any barriers to the employment of women and has generated income and jobs opportunities for women. Besides, via checking the labour

s)		marital status according to the Labour Law of the People's Republic of China, Special provisions on labour protection of female employees and other related regulation and policies. 3. The project complies with the Labour Law [6] and China's gender related policies. 4. There is no opinions and recommendations of an Expert Stakeholder(s). That's because the project will not directly or indirectly reinforce gender-based discrimination and shall not lead to/contribute to adverse impacts. Therefore, the safeguarding principle related to Gender Equality and Women's Rights is not triggered during the project		contracts/26/, CCIPL confirmed that all employeeshave benefitsts based on pregnancy, maternity'paternity leave, or marital status according to the Labor Law of the People's Republic of China /28/. C. It is concluded that the project apply the principlesof nondiscrimination, equal treatment, an' equal pay for equal work which is'in line with the Labor Law Of the People's Republic of China /28/ and China's gender related policies. d.Viacheckingthe Stakeholder Consultation Report /3/, it is verified that there is noopinionsand recommendations of an Expert Stakeholder(s) due to the project will not directlyorindirectly reinforce gender-based discrimination and shall not lead to/contribute to adverse impact. As such there is no risk involved and therefore the project does not violate this safeguarding principle.

[6] http://www.npc.gov.cn/zgrdw/npc/xinwen/2019-01/07/content_2070261.htm

		design and implementation.		
Principle 3. Community Health, Safety and Working Conditions				
1.The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	No	The project activity is designed to introduce new animal waste management systems to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The biogas generated during the treatment process will be captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas. After	Not required	The project is designed to install new animal waste management systems to treat the manure and wastewater from the swine farms to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The biogas produced is captured captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas. After anaerobic digestion, the fermented sludge will be treated in aerobic composting system, which will be used as fertilizer. Besides, the regularly trains on biogas safety and leakage to project employees was the consciousness of safety of biogas, it will ensure that biogas

		anaerobic digestion, the fermented sludge will be treated in aerobic composting system, which will be used as fertilizer. So, the Project doesn't increase the exposure to health risks and adversely affect the health of the workers and the community. In fact, this project can bring benefits to the workers and the community.		leakage and safety hazards will not occur and to ensure the biogas will not affect the health of the workers. The fermented sludge from the aerobic composting system is used to produce organic fertilizer, the organic fertilizers which partly will be supplied to the farmers living around free and which has been confirmed by site inspection and checking the Project Evaluation Report of the project/6/. The validation team has observed that the project will not cause community exposure to increased health risks and shall not adversely affect the health of the workers and the community which is verified by local expertise from validation team. As such there is no risk involved and therefore the project does not violate this safeguarding principle.
Principle 4.1 Sites of Cultural and Historical Heritage				
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	No	The new animal waste management system is not used in sites, structures, or objects with historical, cultural, artistic,	not required	Duringon-site inspection,CCIPL confirmed that project area does not include sites, structures, or objects with historical, cultural,artistic, traditional or religious values or intangible

		traditional or religious values or intangible forms of culture. The project does not utilise Cultural Heritage, including the knowledge, innovations, or practices of local communities, affected communities.		forms of culture. The project does not utilise Cultural Heritage, including the knowledge, innovations, or practices of local communities, affected communities. As such there is no risk involved and therefore the project does not violate this safeguarding principle.
Principle 4.2 Forced Eviction and Displacement				
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The free distribution of the fertilizer produced by this project can help to reduce the costs of purchasing fertilizer for the local people. All the investment for the animal waste management system is provided by Jintai Yangxiang. It obviously does not cause physical or economic relocation of peoples.	not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative/employee and stakeholders were interviewed during the onsite visit audit to confirm the same.
Principle 4.3 Land Tenure and Other Rights				
Does the Project require any change, or have any uncertainties related	No	This project is operated in the swine farm owned by Jintai	not required	Duringon-site inspection and checking the PER of the project/6/, CCIPL

to land tenure arrangements and/or access rights, usage rights or land ownership? For Projects involving land use tenure, are there any uncertainties with regards to land tenure, access rights, usage rights or land ownership?		Yangxiang. So, there is no uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership. The project does not require any change to land tenure arrangements and/or other rights such as resource access rights, community-based property rights and customary rights, which is confirmed by an expert invited by the project owner.		confirmed that project is operated in the swine farm owned by the project owner and the project was approved by local government and it does not require any change to landt enure arrangements and/or other rights such as resource access rights, community-based property rights and customary rights. As such there is no risk involved and therefore the project does not violate this safeguarding principle.
Principle 4.4 - Indigenous people				
Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	Indigenous people have the same and equal opportunity to obtain the fertilizer and they will not be affected directly or indirectly in a negative way by the project. In addition, there are no indigenous people present	not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative/employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

		within the area of influence nor the project is located on territory claimed by indigenous people. This is confirmed by an expert invited by the project owner.		
Principle 5. Corruption				
1.The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No	The project is implemented on the ground by the social enterprise. The ethical codes of the project partners are against corruption. In addition, the companies comply with all related economic laws and regulations of China. This Project has a zero tolerance to corruption policy, anything generated as project revenue shall be spent towards the project monitoring, repair and maintenance, project operation and costs against project	Not required	During on-site inspection,CCIPL confirmed that the project is implemented on the ground by the social enterprise. The ethical codes of the project partners are against corruption. In addition, the companies comply with all related economic laws and regulations of China confirmed by checking the business license of PP/5/. Hence, the Project does not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects. As such there is no risk involved and therefore the project does not violate this safeguarding principle.

		verification and issuance of the emission reduction credits. Hence, the project doesn't involve any transaction of cash and/or kind between the project participant and the beneficiary.		
Principle 6.1 Labour Rights				

1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions 2. Workers shall be able to establish and join labour organisations 3. Working agreements with all individual workers shall be documented and implemented and include: a)Working hours (must not exceed 48 hours per week on a regular basis), AND b)Duties and	No	The project complies with the Labour Law of the People's Republic of China, Special provisions on labour protection of female employees and other related regulation and policies. Jintai Yangxiang will sign contracts with employees. The labour contracts specify working hours, tasks and payments. All employees have benefits based on social security, pregnancy, maternity/paternity leave, or marital status according to the labour laws of China. Besides, the employees also have the right to establish labour unions and to carry on labour union activities. All employees would provide their age information document, e.g., ID, when signing the labour contract, and Jintai Yangxiang did not and will not employ any child labour.	Not required	Via checking the labor contracts/26/, it is verified that the employees are hired according to Labor Law of the People's Republic of China/28/ and following the relevant ILO conventions/58/. Hence no any form of forced or compulsory labor. Via checking the labor contracts/26/, it is verified that contract specify working hours (8 hours per day, 5 days per week), tasks and payments. All employees have benefits based on social security, pregnancy, maternity/paternity leave, or marital status wh'ch has been verified consistent with the request in Labor Law of the People's Republic of China /28/. All employees would provide their age information document, e.g. ID, when signing the labour contract, and the project owner did not and will not employ any child labour. Besides, the employees also have the right to establish labour unions and to carry on labour union activities in accordance with the

tasks, AND c)Remuneration (must include provision for payment of overtime), AND d)Modalities on health insurance, AND e)Modalities on termination of the contract with provision for voluntary resignation by employee, AND f)Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an				PRC Labour Union Law and other applicable laws and regulations. As such there is no risk involved and therefore the project does not violate this safeguarding principle.

Expert Stakeholder opinion) The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures				
Principle 6.2 Negative Economic Consequences				
1. Does the project cause negative economic	No	The equipment procurement cost of the project will be	Not required	Via checking the equipment purchase contract/10/and interview with the

consequences during and after project implementation?		borne by Jintai Yangxiang. The project has positive economic benefits due to the reduced cost of buying fertilizer for local farmer. The project will create fair job opportunities for local people, which is good for the local economy. No risks are foreseen for the local economy through the realization of the project.		Project Developer, it is verified that the equipment procurement cost of the project was born by the project owner, and the project has positive economic benefits due to the reduced cost of buying fertilizer for local farmer. The project will be economically feasible through the sale of emission reduction credits. In addition, the project will create fair job opportunities for local people, which is good for the local economy. As such there is no risk involved and therefore the project does not violate this safeguarding principle.
Principle 7.1 Emissions				

Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project activity is designed to new animal waste management systems to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. The project activity will reduce of GHG in the atmosphere through avoiding methane emissions from anaerobic treatment of swine manure and wastewater.	Not required	Via checking the ER sheet/2/, CCIPL confirmed that the project is designed to install new animal waste management systems to treat the manure and wastewater from the swine farms to avoid methane emissions generated in the baseline uncovered anaerobic lagoons thus decreaseGHG emissions comparing with the baseline scenario. As such there is no risk involved and therefore the project does not violate this safeguarding principle.
Principle 7.2 Energy Supply				
Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project activity will use electricity from Centra China Power Gird, which is a regional grid of China. It will not affect the energy consumptions or power supply or fuel resource supply that provides for	Not required	The justification provided by PP was found adequate based on the sectoral expertiseof validation team. Further PP representative/ employee and stakeholders were interviewed during the onsite visit audit to confirm the same

		other local users.		
Principle 8.1 Impact on Natural Water Patterns/Flows				
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The project will not affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity. This is confirmed by an expert invited by Jintai Yangxiang.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team.
Principle 8.2 Erosion and/or Water Body Instability				
Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	All animal manure will be put into the new animal waste management systems to treat and is prohibited to discharge into the Groundwater and surface water. Therefore, AWMS used in the project area could not	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

		directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion. The fertilizer produced in this project meets the relevant Chinese fertilizer implementation standards, so the project also could not directly or indirectly impact on surface and ground waters or soil erosion on slopes.		
Principle 9.1 Landscape Modification and Soil				
Does the Project involve the use of land and soil for production of crops or other products?	No	Comprehensive utilization and resourceful treatment of the manure waste are encouraged by the local government. The swine farm of the project has obtained necessary approval from the local government, including Planning Permit on Land for	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

		Construction Use, Environmental Impact Assessment etc. Hence, the project does not involve the use of land and soil for production of crops or other products.		
Principle 9.2 Vulnerability to Natural Disaster				
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The new animal waste management systems used in the project area does not involve any land use changes. It would not lead to the exacerbation of impacts caused by natural or man-made hazards, such as landslides or floods.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.
Principle 9.3 Genetic Resources				
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes	No	The project does not involve the use of GMOs, so it will not have negatively impacted by the use of genetically modified organisms or GMOs.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

and production)?				
Principle 9.4 Release of pollutants				
Could the Project potentially result in the release of pollutants to the environment?	No	The project is designed to introduces new animal waste management systems to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons. During the treatment process, the biogas was captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas, the fermented sludge was treated in aerobic composting system, the wastewater was treated aerobically and then used for agriculture irrigation, so no	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

		pollutants release to the environment.		
Principle 9.5 Hazardous and Non-hazardous Waste				
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	Potential	The project activity will replace the current open anaerobic lagoons with new closed anaerobic digesters. The biogas generated during the treatment process will be captured for hot water generation, and the residual biogas will be flared by internal combustion emergency flare (closed flare) if there is any surplus biogas.power generation or flared. If biogas is not handled properly during the operation period of the project, methane leakage/explosion may be caused.	Required. For this project, the biogas will be generated during the treatment process, if biogas is not handled properly during the operation period of the project, methane leakage/explosion may be caused. So, the Mitigation Measures were needed. In this project, the mitigation measure for safeguarding principles was that Jintai Yangxiang will conduct regular training on biogas safety and leakage to project employees to improve their proficiency in the treatment system and ensure that biogas leakage and safety hazards will not occur, and the employee training of biogas safety operation	Via on-site inspection, it is verified that the project does not involve any hazardous materials resulting from their production, transportation, handling, storage and use in the Project. However, the risk was identified that the project,methane explosion may be caused if biogas is not handled properly during the operation period. The relate mitigation measures have been provided and added to the Monitoring Plan. The monitoring parameter of Employee Training of biogas safety operation has been listed for monitoring which is confirmed as the proper mitigation measures. As such there is no risk involved and therefore the project does not violate this safeguarding principle.

			will be monitored through the training record. Also, the Mitigation Measure for Safeguarding Principles, i.e., the parameter of "Employee Training of biogas safety operation" was included in the monitoring plan in section B.7.1 and B.7.3.	
Principle 9.6 Pesticides & Fertilisers				
Will the Project involve the application of pesticides and/or fertilisers?	No	The project activity does not involve the harvesting of forests.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.
Principle 9.7 Harvesting of Forests				
Will the Project involve the harvesting of forests?	No	The project activity does not involve the harvesting of forests.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.
Principle 9.8 Food				

Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project activity does not involve the modification of the quantity or nutritional quality of food available.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team.
Principle 9.9 Animal husbandry				
Will the Project involve animal husbandry?	No	The project is designed to introduces new animal waste management systems to treat the manure and wastewater from the swine farm to avoid methane emissions generated in the baseline uncovered anaerobic lagoons, belongs to waste disposal and resource utilization.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.
Principle 9.10 High Conservation Value Areas and Critical Habitats				
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The project is not located in an area within a high conservation value area or within critical natural habitats. The project activity does not physically affect or alter largely intact or High Conservation Value (HCV) ecosystems,	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

		critical habitats, landscapes, key biodiversity areas or sites identified. In addition, the "Measures for the Management of Livestock and Poultry Breeding in Jiangxi Province" clearly stipulate the prohibited construction area[7].		
Principle 9.11 Endangered Species				
a. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? b.Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	There are no endangered species identified as potentially being present within the Project boundary. In addition, the new animal waste management systems used in the project will not pose a threat to any species.	Not required	The justification provided by PP was found adequate based on the sectoral expertise of validation team. Further PP representative /employee and stakeholders were interviewed during the onsite visit audit to confirm the same.

[7] http://dara.gd.gov.cn/gkmlpt/content/2/2710/post_2710498.html#1602