

PROJECT REVIEW REPORT

This project review report includes findings raised during Verra’s review of the project specified below. The VVB must address the findings before the project request can be considered for approval by Verra. The project review report will be made publicly available on the Verra Registry. Confidential information may be provided in separate attachments.

Project ID	3164
Project Name	Yantai XinhaoSwine Farm Manure Management System GHG Mitigation Project
Review Type	Registration and Verification
Program(s)	VCS Program
Verification Period	05 March 2021-30 June 2022
Project Proponent	Yantai Xinhao agriculture and animal husbandry Co., Ltd.
Methodology	ACM0010 “GHG emission reductions from manure management systems”, Version 08.0
VVB	Shenzhen CTI International Certification Co., Ltd.
Assessment Criteria	VCS Standard Version 4.4
Date of First Issue	10 May 2023
Review Conclusion	30 August 2023
Date of Final Issue	Approve

FINDINGS

#	Finding Description	VVB Response	Status
1	Further information on license for production and operation of the project/farm		
	<u>Issue</u> Sections 1.14 of the joint project description and monitoring report (JPD-MR) and 3.1 of the joint validation and verification report (JVR-VR) do not mention the approval dates of the license for production and operation of the project/farm. <u>Action item</u> 1. The VVB must ensure that the project proponent describes in Section 1.14 of the JPD-MR the the approval date of the license for production and operation of the project/farm. 2. The VVB must validate this information and update Section 3.1 of the JVR-VR as needed. <u>Program rule(s) or methodology section</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Section 1.14 VCS Joint Validation and Verification Report Template v.4.2, Section 3.1;	Round 1 <u>VVB Response</u> 1. The project has obtained the license for production and operation of the farm by the Muping District Administrative Approval Service Bureau on 14-February-2020. PP has added the approval date of the farm production and operation permit to JPM section 1.14. 2. Via checking the license for production and operation of the farm issued by Muping District Administrative Approval Service Bureau dated on 14-February-2020, it is verified that PP got the license for production and operation of the project/farm and related section 3.1 of VVR has been updated with approval date. <u>Verra Response</u> The required information was included in the revised documents. The finding is closed. Round 2 <u>VVB Response</u> <u>Verra Response</u>	Close
2	Incomplete information on no net harm		
	<u>Issue</u>	Round 1 <u>VVB Response</u>	Closed

Sections 2.1 and 2.3 of the JPD-MR describe the control measures taken to mitigate any potential negative environmental impact related to the operation of the project activity in future tense, therefore it is not clear which measures have been taken during the monitoring period. <u>Action Required</u> 1. The VVB must ensure that the project proponent describes in Sections 2.1/2.3 of the JPD-MR the control measures taken to mitigate any potential negative environmental and socio-economic impact of the project activity. 2. The VVB must validate this information and update Section 3.2.1 of the validation report as needed. <u>Program Rule(s)</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Sections 2.1/2.3 VCS Joint Validation and Verification Report Template v.4.2, Section 3.2.1	1. The section 2.1/2.3 of the JPD-MR has been updated by PP using the correct tense which is relevant to this monitoring period. During the monitoring period, according to the Technical Guidelines for the Construction of Faecal Waste Treatment Facilities in Livestock and Poultry Farms (Households)¹, PP carried out the following control measures in the farm to mitigate any potential negative environmental and socio-economic impact of the project activity: In Anaerobic digester treatment process, as this project adopts UASB to treat faecal waste, it covered and laminated to reduce the emission of malodorous gases and the entry of rainwater to ensure that the manure is fully fermented and putrefied, and the substances such as Ascaris lumbricoides eggs, faecal coliform bacteria, cadmium, mercury, arsenic, lead, chromium, thallium, and so on, meet the "Limit Requirements of Toxic and Hazardous Substances in Fertilizers"² after the treatment. In Aerobic composting process, this project adopts closed aerobic fermentor to treat swine manure, which is equipped with necessary facilities and equipment for deodorisation and prevention of leakage, to ensure that swine manure does not produce odorous gas and leakage of odorous liquid during the fermentation process, which will affect the living environment of the surrounding residents. Swine manure is fully fermented and putrefied, and substances such as Ascaris lumbricoides eggs, faecal coliform bacteria, cadmium, mercury, arsenic, lead, chromium, thallium, etc., meet the " Limit Requirements of Toxic and Hazardous Substances in Fertilizers " after treatment. In conclusion, via site inspection and checking the equipment and technology the project adopted, VVB confirmed that the	
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1 http://www.moa.gov.cn/nybggb/2022/202209/202210/t20221010_6412911.htm

2 <https://std.samr.gov.cn/gb/search/gbDetailed?id=9A0A4FA998C8D4A5E05397BE0A0AD02D>

		project owner has taken appropriate measures to minimize adverse environmental impacts, the project will not have a significant negative impact on the surrounding environment and socio-economic during neither construction period, operation period nor the 1st monitoring period. The project has been approved by the local Bureau of Ecology and Environment, all the activities have been carried under the regulation of local Bureau of Ecology and Environment. The environmental impact analysis and measures used in the project are in accordance with relevant environmental standards. Also, according to the conclusion from EIA report that approved by local government, the environmental impact, both during the project construction period and operation period, won't have a significant and negative on the surrounding environment. On the contrary, the implementation of the project will significantly improve the quality of the local environment, achieve environmentally sound treatment of agricultural organic waste, reduce the impact of agricultural organic waste on surface water and groundwater, and reduce greenhouse gas emissions. PP has added a relevant note in section 2.3 of the JPM. 2. Related assessment has been added into the section 3.3.3 of the VVR. <u>Verra Response</u> All mitigation measures adopted were includes in the revised documents, and the VVB also included how the measures were validated. The finding is closed. Round 2 <u>VVB Response</u>	
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		<u>Verra Response</u>	
3	Incorrect version of methodology and missing Tool		
	<u>Issue</u> Section 3.1 of the JPD-MR does not include the applicable TOOL27. <u>Action Required</u> 1. The VVB must ensure that the project proponent includes the applied TOOL27 in Section 3.1 of the JPD-MR. 2. The VVB must validate this information and update validation report as needed. <u>Program Rule(s)</u> <i>VCS Joint Project Description and Monitoring Report Template v.4.2, Section 3.1</i> <i>VCS Joint Validation and Verification Report Template v.4.2, Section 3.4.1</i>	Round 1 <u>VVB Response</u> 1. PP has indeed performed an investment analysis in JPM based on the "Combined tool to identify the baseline scenario and demonstrate additionality (Version 07.0)", taking into account the latest approved TOOL27 "Methodological tool: Investment analysis" (version 10.0). PP has provided an additional description of the application of TOOL27 in section 3.1 of JPD-MR. 2. VVB has updated the VVR section 3.4.1 with this tool. <u>Verra Response</u> Documents were adjusted to include the Tool 27. The finding is closed. Round 2 <u>VVB Response</u>	Closed

		<u>Verra Response</u>	
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4	Missing information in project boundary diagram		
	<u>Issue</u> Figure 3-2 of the JPD-MR does not indicate the fraction of volatile solids degraded within the project boundary in pre-project situation before disposal, as required by para. 12 of ACM0010, v.08.0. <u>Action item</u> 1. The VVB must ensure that the project proponent includes the requirements para. 12 of ACM0010, v.08.0 related to the pre-project boundary diagram. 2. The VVB must assess the diagrammatic representation and confirm that it is aligned with the methodology requirements. <u>Program Rule(s)</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Section 3.3 VCS Joint Validation and Verification Report Template v.4.2, Section 3.3.3	Round 1 <u>VVB Response</u> 1. PP has added details in Figure 3-2 of the JPM as per the Paragraph 12 of ACM0010 v08.0 which requires that "The diagrammatic representation shall also indicate the fraction of volatile solids degraded within the project boundary in the pre-project situation before disposal." This means that the fraction of volatile solids degraded during the disposal of manure in the baseline scenario within the project boundary. For the project, the manure treatment prior to the project activity was the direct discharge of manure into an uncovered anaerobic lagoon. Uncovered anaerobic lagoon falls under the anaerobic treatment of "One-cell lagoon" in the Appendix 1 of applied methodology ACM0010 (version 08.0), and therefore an $R_{VS,n}$ is 85% which is the most conservative value. 2. The updated Figure 2-3 has been checked by VVB, the information of diagrammatic representation is verified in line with the methodology requirement.	Closed
		<u>Verra Response</u>	

		The diagram was updated to include the fraction of volatile solids degraded in the baseline. The finding is closed.	
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5	Further assessment of benchmark used		
	<u>Issue</u> The investment analysis uses a benchmark of 9.5% sourced from the NDRC, dated 2013 while the TOOL27, v.10 (valid at the time of investment decision) refers to a value for Group 1 of 8.58%. <u>Action item</u> 1. The VVB must explain how it considered that the benchmark used, which is sourced from a report from 2013, was valid at the time of investment decision and is more suitable than the default value defined as per the TOOL27, v.10. <u>Program Rule(s)</u> TOOL27, v.10	Round 1 VVB Response The construction start date of the project is 02-January-2021 which is defined as the investment decision date, so based on checking the issued date of the Tool 27, it is confirmed that the default value for cost of equity (expected return on equity) defined in Tool 27 version 10.0 (issued on 28-November-2019) is applicable to the project due to it is the latest version when the PP decided the investment of the project. Meanwhile, in the application of TOOL27, this project falls under "13. Waste handling and disposal" in Appendix , which has a Default value for the expected return on equity of 8.58%. This data is provided by the latest version of TOOL27 when the PP decided the investment of the project, which is a more reasonable and conservative benchmark to use as an investment comparison compared to the 2013 benchmark of 9.5% from the NDRC. Hence VVB has asked PP to change the benchmark as per the Tool 27 in JPM and IRR to 8.58%. VVB also updated the related data in VVR accordingly. <u>Verra Response</u> The benchmark applied was corrected to 8.58% based on Tool 27, v.10. The finding is closed.	Closed
6	Missing information and assessment on additionality		

Issue	Round 1	Closed
As per the investment analysis presented, it remains unclear: (a) why the fertilizer's sales tariff has been considered fixed for the entire period. (b) How the VVB considered that the O&M costs are appropriate for the project activity, in particular considering that they represent almost 16% of the total static investment. Finally: (c) the IRR excel sheet is missing in the submitted documents and; (d) footnotes 23 and 24 of the JPD-MR are not accessible. <u>Action item</u> 1. The VVB must ensure that the project proponent addresses points a, b and d in the JPD-MR and describes the actual purchase order placed for the O&M service provider and each component of the O&M costs. 2. The VVB must further validate the information required above and update Section 3.3.5 of the JVR-VR as needed. 3. The IRR calculation spreadsheet must be provided for further reference and further information shall be included in the PD to allow a third party to replicate the IRR calculations. The VVB shall consider that as per the VCS Standard v.4.4 section 3.5.3: "Information in the project description related to the determination of the baseline scenario, demonstration of additionality, and estimation and monitoring of GHG emission reductions and removals shall not be considered to be commercially sensitive and shall be provided in the public versions of the project description."	<u>VVB Response</u> 1. PP has stated the required point a,b,d in JPD-MR as below, (a) Firstly, the sales price of organic fertilizer generated by this project is 330RMB, this value comes from the project evaluation report, which is decided according to the raw materials, production technology, quality of organic fertilizer and other factors. Secondly, through the organic fertilizer sales contract, we know that the sales price of organic fertilizer signed in this contract is 330RMB/t. The contract was signed on 15 February 2021 with a validity period of 25 years, which is consistent with the crediting period of the project. Finally, during the project period, the government will not adjust the fertilizer sales policy frequently, therefore, the project company will not change the sales method and price of organic fertilizer. As a result, the project's organic fertilizer sales are fixed. (b) For this project, various equipment and facilities are necessary for the implementation of the project. As the project activities are carried out, the equipment will experience increasing wear and tear, which means that maintenance costs will increase in the coming years. The success of the project is not only dependent on the achievement of emission reduction targets, but also on ensuring that the project is sustainable and profitable in the long term. Considering O&M costs can help to assess the operation and maintenance requirements of a project and ensure that the project will continue to operate and deliver the expected emission reduction benefits after implementation. Therefore, using O&M costs as a factor in the sensitivity analysis is applicable to this project. O&M costs in this project include Maintenance expense, Salary, Welfare, Labor insurance expense, housing fund, insurance expense , and Other costs. In estimating project costs, maintenance costs are calculated as a percentage of the fixed asset maintenance rate. There is no regulation or guidance on the maintenance rate of fixed assets in China. Based	
<u>Program Rule(s)</u>		

VCS Standard v.4.4 section 3.5.3 CDM TOOL02, v.07.0 CDM Tool 27	on the general situation of similar projects in China, the estimated value is 3. 0% to 5. 0%. Therefore, the 5% of the maintenance rate is reasonable. At the same time, fixed asset purchase contracts and equipment maintenance service contract provided by project participants are used as cross-checking documents for this portion of the operation and maintenance costs. Salary, Welfare, Labor insurance fees, housing fund are all mentioned in the labour contract already provided by PP. (a) Average salary: 60,000 RMB According to the China Statistical Yearbook 2022³, the average salary in Shandong Province in 2021 for employees in private urban agriculture, forestry, animal husbandry and fishery units was RMB 47,861/year, and the average salary for employees in non-private units was RMB 66,504/year. The average wage of RMB 60,000 for this project is moderate. (b) Welfare: 14% According to “Implementation Regulations of the Enterprise Income Tax Law of the People's Republic of China”⁴, the welfare shall not exceed 14% of the total salary. Therefore, 14% of welfare is reasonable. (c) Labor insurance fees : 17% According to the “Decision of the State Council on Improving the Basic Pension Insurance System for Enterprise Employees”⁵, the “Notice of the Ministry of Human Resources and Social Security and the Ministry of Finance on Adjusting the Work-related Injury Insurance Premium Rate Policy”⁶ and the “Unemployment Insurance Regulations”⁷, the contribution ratio of endowment insurance is 16%, and the contribution ratio of	
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3 <http://www.stats.gov.cn/sj/ndsj/2022/indexch.htm>

4 https://www.gov.cn/zwqk/2007-12/11/content_830645.htm

5 https://www.gov.cn/zhengce/content/2008-03/28/content_7376.htm

6 http://www.mohrss.gov.cn/xgk2020/fdzdgknr/zcfg/gfxwj/shbx/201507/t20150729_216271.html

7 http://www.mohrss.gov.cn/xgk2020/fdzdgknr/zcfg/fg/202011/t20201103_394936.html

		industrial injury insurance and unemployment insurance is about 1%. Therefore, it is reasonable to adopt 17% of the labor insurance premium rate. (d) Housing fund:10% According to the information published on the official website of the Central People's Government of China ⁸, the contribution ratio of the legal surplus reserve fund in Shandong Province is 5-12%. Therefore, it is reasonable to use 10% for this project. These data in IRR are consistent with the results obtained after cross-checking with the labour contracts of farm employees. The insurance expense is determined by the degree risk of the project. it generally includes construction engineering insurance rate, machinery and equipment insurance rate, and electrical equipment insurance rate. Through checking the public information, the construction engineering insurance rate can be 0.2%-1.5% in general and the machinery and equipment insurance rate, and electrical equipment insurance rate can be 1.5%-5% in China⁹. Therefore, the 2.5% of insurance rate is considered to be reasonable. Concerning the other cost, there are no regulations or guidance on other costs in China. Based on the general situation of similar projects in China, the estimated value of other costs is 20-60 RMB/tons. Therefore, the value of RMB 50/tonne applied to other costs in this project is reasonable. This cost mainly comes from the cost of purchasing the packaging of the organic fertilizer generated by the project activity. As part of the organic fertilizer generated by the project is distributed free of charge to local farmers and the other part is sold in the domestic market, packaging costs are incurred,	
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⁸ https://www.gov.cn/gongbao/content/2019/content_5468861.htm

⁹ https://wenku.baidu.com/view/18a5f9375bfafab069dc5022aeea998fcd224045.html?_wks_ =1688436367372&bdQuery=%E5%BB%BA%E7%AD%91%E5%B7%A5%E7%A8%8B%E4%BF%9D%E9%99%A9%E8%B4%B9%E7%8E%87%E4%BE%9D%E6%8D%AE

		therefore, the project participants have provided the order form for packaging of organic fertilizers as evidence for cross-checking, and the unit price of the order form is RMB 50/tons to prove the authenticity of this part of the cost. (d) Footnotes 23 and 24 are official websites of the Chinese government, and probably due to the sensitivity of the information, foreign browsers(eg, Chrome , Bing, Microsoft Edge, Firefox) cannot view the Chinese website. PP has taken screenshots of the pages of these two footnotes as below to show their authenticity; also VVB has confirmed that these two footnotes can be opened and that the content is authentic. 23 http://fgw.shandong.gov.cn :  24 http://nync.shandong.gov.cn :  2. VVB has updated the section 3.3.5 of the JVR-VR with related assessment of above issues. 3. The IRR calculation sheet has been provided. <u>Verra Response</u> All required explanations were included in the revised documents. The finding is closed.	
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7	Incorrect reference in equation 7		
	<u>Issue</u> Equation 7 of the JPD-MR refers to EN20,D,y while it shall be BEN20,y. <u>Action item</u> 1. The VVB must ensure that the project proponent corrects the reference in equation 7 of the JPD-MR. <u>Program rule(s)</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Section 5.1	Round 1 <u>VVB Response</u> The updated Equation 7 of the JPD-MR has been checked, VVB confirmed that PP has corrected E _{N20,D,y} to BE _{N20,y} . <u>Verra Response</u> Documents were adjusted as required. The finding is closed.	Closed
8	Missing formula and information for the emission reduction calculation		
	<u>Issue</u> The JPD-MR does not identify the methodological choices selected for the calculation of the ex-ante emission factor for electricity consumption (i.e., EF _{EF,j,y} =0.7119 tCO ₂ /MWh). <u>Action Required</u> 1. The VVB must require the project proponent to identify all the methodological choices which have been selected for the calculation of the emission factor for electricity consumption, as required by Section 6.2.1.1 of the TOOL05, v.03.0. Please also refer to the latest approved version of the “Tool to calculate the emission factor for an electricity system”. <u>Program Rule(s)</u> TOOL05 v.03.0, Section 6.2.1.1	Round 1 <u>VVB Response</u> The updated section 5.2 of JPD-MR has been checked, VVB confirmed that PP has added a description of the source of the tool used to determine EF _{EF,j,y} and the calculation process in line with the related tools as below, Firstly, all electricity used in this project is provided by the NCPG and falls under Scenario A of Tool 05 (version 03.0). Therefore, emissions related to electricity consumption need to be calculated according to Tool 05. Secondly, for conservativeness, in baseline scenario, manure was treated in a lagoon, the emissions from electricity consumption are ignored. Therefore only the emission factor for electricity consumption in the project activity needs to be determined.	Closed

	Regarding the emission factors for electricity generation for the project activity: According to Tool 05 V3.0, section 2.2, paragraph 5, this project applies to Option A1. Therefore the procedures in the latest approved "Tool to calculate the emission factor for an electricity system" ($EF_{EL,j/k/l,y} = EF_{grid,CM,y}$) needs to be used to calculate the combined margin emission factor of the applicable electricity system. The calculation of the combined marginal emission factor according to Tool 07 V7.0 is as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$ where: <table><tr><td>$EF_{grid,OM,y}$</td><td>Build margin CO₂ emission factor in year y (t CO₂/MWh)</td></tr><tr><td>$EF_{grid,BM,y}$</td><td>Operating margin CO₂ emission factor in year y (t CO₂/MWh)</td></tr><tr><td>W_{OM}</td><td>Weighting of operating margin emissions factor (per cent)</td></tr><tr><td>W_{BM}</td><td>Weighting of build margin emissions factor (per cent)</td></tr></table> Where the NCPG is thermal, so in the first crediting period, $W_{OM}=0.5$, $W_{BM}=0.5$.and $EF_{grid,OM,y}=0.9419$ t CO₂/MWh, $EF_{grid,BM,y}=0.4819$ t CO₂/MWh for the NCPG¹⁰. Finally, $EF_{EF,j,y} = EF_{grid,CM,y} = 0.9419t \text{ CO}_2/\text{MWh} \times 0.5 + 0.4819t \text{ CO}_2/\text{MWh} \times 0.5 = 0.7119 \text{ t CO}_2/\text{MWh}$	$EF_{grid,OM,y}$	Build margin CO ₂ emission factor in year y (t CO ₂ /MWh)	$EF_{grid,BM,y}$	Operating margin CO ₂ emission factor in year y (t CO ₂ /MWh)	W_{OM}	Weighting of operating margin emissions factor (per cent)	W_{BM}	Weighting of build margin emissions factor (per cent)	
$EF_{grid,OM,y}$	Build margin CO ₂ emission factor in year y (t CO ₂ /MWh)									
$EF_{grid,BM,y}$	Operating margin CO ₂ emission factor in year y (t CO ₂ /MWh)									
W_{OM}	Weighting of operating margin emissions factor (per cent)									
W_{BM}	Weighting of build margin emissions factor (per cent)									
	<u>Verra Response</u> All required information was included in the revised documents. The finding is closed.									

¹⁰ https://www.mee.gov.cn/ywgz/xdqhbh/wsqtz/202012/t20201229_815386.shtml

9	Incorrect estimation and calculation of NEX _{IPCCdefault}	
	<u>Issue</u> The JPD-MR states that NEX_{IPCCdefault} is calculated as per equation 13, however, as per the selected Option 2 of Appendix 2 of ACM0010, the default values from IPCC must be used. <u>Action item</u> 1. The VVB must ensure that the project proponent determines NEX_{IPCCdefault} as per Appendix 2 of ACM0010, v.08.0. 2. The VVB must further validate the calculation and update the validation report as needed. <u>Program rule(s)</u> Appendix 2 of ACM0010, v.08.0	Round 1 <u>VVB Response</u> 1. According to the selected Option 2 of Appendix 2 of ACM0010, the default values in IPCC can be used in the calculation of NEX_{LT,y} and should be corrected according to the following equation, which is equation 12 in JPD-MR: $NEX_{LT,y} = \frac{W_{site}}{W_{default}} * NEX_{IPCCdefault}$ The default values in the IPCC are used in the equation. In contrast, it is explicitly required that the NEX_{IPCCdefault} values be calculated as in Equation 10.30 in the 2019 Refinement to the 2006 IPCC Guidelines, with N_{rate(T)} and TAM as the default values in the 2019 Refinement to the 2006 IPCC Guidelines. This equation is Equation 13 in JPD-MR, the source of the equation is explained in footnote 30. $NEX_{IPCC default} = N_{rate(T)} * \frac{TAM}{1000} * 365^{11}$ Therefore, VVB confirmed that PP does determine the default values according to Option 2 of Appendix 2 of ACM0010 and 2019 Refinement to the 2006 IPCC Guidelines. <u>Verra Response</u> The calculation was done based on the 2019 IPCC refinement to 2006 IPCC guidelines, as required by Verra (the most recent IPCC guidelines shall be applied in the calculations). The finding is closed. <u>VVB Response</u>

Closed

¹¹ This equation refers to the equation 10.30 in chapter 10 volume 2019 Refinement to the 2006 IPCC Guidelines.

		<u>Verra Response</u>	

10	Further clarification on calculation of QCH4		
	<u>Issue</u> Section 7.5 of the JPD-MR uses for the calculation of the methane captured the volume measured at the outlet of the anaerobic digester during the monitoring period (i.e., 15,570,408.40 m3). However, as per the information in page 128, the volume measured at the inlet of the boiler is lower (i.e., 15,386,930.83 m3). It remains unclear why the higher volume measured is used in the net emission reductions calculation which could lead to a less conservative result. <u>Action item</u> 1. The VVB must ensure that the project proponent clearly explains why the less conservative result between the biogas measured at the outlet of the digester and the inlet of the boiler has been used in the net calculation of the emission reductions. 2. The VVB must further validate the calculation and update the validation report as needed. <u>Program rule(s)</u>	Round 1 <u>VVB Response</u> 1. Firstly, The methane captured the volume measured is used to calculate $Q_{CH4,y}$ and PE_{CH4} $Q_{CH4,y} = \sum_{i=1}^{8760} F_{i,t}$ $F_{i,t} = V_{t,db} * v_{i,t,db} * \rho_{i,t}$ $F_{i,t}$ means the mass flow rate of greenhouse gases in the gas stream during the time interval t. The calculation of the mass flow rate of methane in the biogas during the time interval t involves three parameters, i.e., the volume of biogas during the time interval t, the volume fraction of methane in the biogas during the time interval t, and the density of methane in the biogas during the time interval t. In this case, the volume fraction of methane in the biogas is constant, whereas the volume of biogas and the density of methane in the biogas are affected by temperature. During the monitoring period, the volume of biogas measured at the outlet of the anaerobic digester did not match the volume measured at the boiler inlet, VVB confirmed that it is due to the fact that manure is designed to be treated anaerobically at a temperature of 35-38°C. The temperature of biogas at the outlet	Closed

	VCS Joint Project Description and Monitoring Report Template v.4.2, Section 7.5 VCS Joint Validation and Verification Report Template v.4.2, Section 4.1	of the anaerobic digester was measured to be an average of 36°C, the biogas is relatively larger in volume and the density of methane is relatively smaller at this temperature. Then the biogas is transported to the boiler inlet through the pipeline, without any gas leakage, and as the temperature decreases, the biogas stream cools down, the volume is reduced, and the methane density increases, but the volume fraction of methane remains unchanged, and the total mass, i.e., Q_{CH_4}, is constant, and the Q_{CH_4} during the monitoring period is calculated to be 6,817.76 tCH₄, i.e., 190,897 tCO₂e. Therefore, the amount of methane captured by the project is 190,897tCO₂e. Second, If the lower data at the boiler inlet is used to calculate Q_{CH_4}, it will lead to the reduction of project emissions and the increase of emission reduction, which is an even less conservative result. 2. VVB has assessed as above and no need to update the VVR as the calculation in the JPD-MR is correct. This was confirmed by the VVB on site review and checking the Monthly operation record including heat data of the project. <u>Verra Response</u> The VVB explained the difference in the volume measured due to the difference in temperature of the two gas streams, however, the total methane is the same as the density also changes. The finding is closed.	
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11	Further clarification on project activity		
	<u>Issue</u> Section 1.1 of the JPD-MR states that all the biogas generated is used for heat generation. However, it remains unclear how this is ensured since as per the information in page 128, the	Round 1 <u>VVB Response</u> 1. All biogas generated after project implementation is used for heat generation, which has been confirmed by VVB during on-site	Closed

volume measured at the outlet of the anaerobic digester during the monitoring period is 15,570,408.40 m³ while the volume measured at the inlet of the boiler is 15,386,930.83 m³ (lower). Further, it is stated that emission reductions from heat generation will not be claimed ‘for conservativeness’, without explaining whether there was heat generation in the baseline scenario via fossil fuel use or imported electricity. Finally, as per the information in the Summary and Sections 1.4 and 3.1 of the JVR-VR the total heat production is estimated to be 223,320GJ/y while the JPD-MR refers to a value of 342,200GJ/y and the total emission reductions are indicated as 739,585tCO₂e. <u>Action item</u> 1. The VVB must ensure that the project proponent clearly explains how it is ensured that all the biogas generated is used for heat generation and if there was heat generation/use in the baseline. 2. The VVB must further validate this information and update the validation report as needed. It must further clarify the estimated total emission reductions and annual heat generation of the project. <u>Program rule(s)</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Section 1.1 VCS Joint Validation and Verification Report Template v.4.2, Section 3.1	visit. Evidence of Monthly operation record including heat data during project monitoring period has been checked to prove this. Regarding the inconsistency between the volume of biogas measured at the outlet of the anaerobic digester and the volume measured at the boiler inlet, as assessed in finding 10 above, it is reasonable and conservative to use this anaerobic digester outlet measurement of 15,570,408.40 m³ to calculate the emission reductions. In the description of the project boundary in section 3.3 of the JPM, PP summarized the greenhouse gases included or excluded from the project boundary. The baseline scenario is a lagoon, an open site with no other facilities and no heat generation/use. When implementation of the project activity begins, all biogas is used for heat generation, and this produces a reasonable and conservative emission reduction result. 2. Regarding the inconsistency of the heat production in the JVR-VR, via checking the PER, it is confirmed that the value of 342,200 GJ/y as described in the JPD-MR, with an estimated total emission reduction of 644,077 tCO₂e in the first crediting period is correct, while values in JVR-VR are typo and has been updated accordingly. <u>Verra Response</u> The VVB explained all findings and adjusted the documents when needed. The finding is closed.	
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12	Inconsistent SDG indicator and related monitored parameter		
	<u>Issue</u> Section 1.17.2 of the JPD-MR states that for SDG 7.2.1 (i.e., renewable energy share in the total final energy consumption) the m³ of biogás generated is going to be measured. However, this monitored parameter is not measuring the amount of energy. . <u>Action item</u> 1. The VVB must ensure that the project proponent defines for the SDG indicator 7.2.1 a related monitored parameter. 2. The VVB must further validate this information and update the validation report as needed. <u>Program rule(s)</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Section 1.17.2 VCS Joint Validation and Verification Report Template v.4.2, Section 3.1	Round 1 <u>VVB Response</u> 1. The content of SDG7 is “Access to affordable, reliable, sustainable and clean energy for local farmers”, so the monitored parameter for this project should be the amount of heat generated by the project using biogas. PP has corrected the relevant content in the full JPD-MR in relation to SDG7. 2. Section 3.1 of the VVR has been update accordingly. <u>Verra Response</u> Documents were adjusted accordingly. The finding is closed.	Closed

13 Inconsistent SDG indicator and contribution/monitoring			
	<u>Issue</u> Section 3.2 of the JPD-MR states, under applicability 1 of TOOL14, that 'No biogas is flared through the flaring System'. However, there is an open flare system.	Round 1	Closed
		<u>VVB Response</u> Section 3.2 of the JPD-MR has been checked by VVB, it is confirmed that PP has provided additional clarification in this regard. For an AWMS on a farm it is extremely necessary to have an open flare system for the entire process of manure treatment and	

	<u>Action item</u> 1. The VVB must ensure that the project proponent corrects the contradiction regarding the flaring system in Section 3.2 of the JPD-MR. <u>Program rule(s)</u> VCS Joint Project Description and Monitoring Report Template v.4.2, Section 3.2	biogas utilisation. The purpose of this is to avoid a situation where biogas is used for heat production and then there is a surplus of biogas that is released to the atmosphere. For this project, during this monitoring period, by checking the Daily operation record, it is verified that all the captured biogas is used for heat production and the heat is supplied to the whole AWMS, no residual biogas is produced and $V_{t,db}$ (m³ dry gas/h) monitored by flow meter 3 that installed at the inlet of flare system is shown as 0. Therefore, no residual biogas is burned through the flare system. However, this does not indicate that a flare system is not required and if surplus biogas occurs in the future monitoring period as the project continues, then the biogas will be burned through the flare with no emissions to air and related flared quantity will be monitored by flow meter 3. <u>Verra Response</u> The VVB clarified that the flare was not used during the monitoring period. The finding is closed.	
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