FINAL VERIFICATION REPORT FOR "Composting Project in Santa Catarina"

RINA

Document Prepared By RINA Services S.p.A. (RINA)

Project Title	Composting Project in Santa Catarina
Version	1.1 Aa
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Report Title	Verification Report of the Composting Project in Santa Catarina
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Summary:

RINA Services S.p.A. (RINA), commissioned by Sustainable Carbon – Projetos Ambientais Ltda, has verified the greenhouse gas emission reductions reported for the project activity " Composting Project in Santa Catarina" in Brazil, VCS Registration Reference N° 1144, for the period 01/01/2013 to 30/06/2015, with regard to the relevant requirements for VCS and CDM activities. The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS / CDM requirements in order to be certified.

The project was validated by Designated Operational Entity TÜV Rheinland (China) Ltd (validation report N° 2793.11.A.0 issued on 06/02/2014) and it was registered under the VCS registration reference N°1144.

The objective of the verification is to have an independent review ex post determination of the monitored reductions in GHG emission reductions, Verification was conducted using RINA procedures in line with the requirements specified in the VCS Version 3.5 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The verification consisted of desk review, on-site assessment and the resolution of outstanding issues and the issuance of the final verification report and certification.

The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS Version 3.5 requirements, which refer to CDM rules, in order to be certified

The GHG emission reductions were calculated on the basis of the monitoring plan included in the registered Project Document, version 06.1 of 10/01/2014 and the approved methodologies:

- AMS-III.F. - "Avoidance of methane emissions through composting", version 10, dated 18/02/2011
- AMS-III.D. – "Methane recovery in animal manure management systems", version 18, dated 29/09/2011

In conclusion, it is RINA's opinion that the project activity "Composting Project in Santa Catarina" in Brazil, VCS project ID 1144, meets all relevant requirements for VCS standard and guidelines and correctly applies the baseline and monitoring methodology • AMS-III.F. - "Avoidance of methane emissions through composting", version 10, dated 18/02/2011 and AMS-III.D. – "Methane recovery in animal manure management systems", version 18, dated 29/09/2011. The monitoring system is in place and the emission reductions are calculated without material misstatement. Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/01/2013 to 30/06/2015 amount to 28,564 tCO_2e.

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1 INTRODUCTION

1.1 Objective

RINA has been commissioned by "Sustainable Carbon – Projetos Ambientais Ltda" to perform an independent verification of its VCS project, "Composting Project in Santa Catarina", already registered under VCS with Project ID. 1144 for the reported GHG emission reductions for the given monitoring period 01/01/2013 to 30/06/2015. The VCS projects must undergo independent third party verification and certification of emission reductions as the basis for issuance of Voluntary Emission Reductions (VERs/VCUs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Voluntary Emission Reductions (VERs/VCUs)without any double counting, and

- To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence.

The project is assessed against the requirements of VCS version 3 and related rules and guidance. RINA has, based on the recommendations in the latest version of CDM Validation and Verification Manual, and employed a rule-based approach (as criteria) in the verification, focusing on the identification of significant reporting rules and the reliability of project monitoring.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

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1.3 Level of Assurance

The draft final verification report before being submitted to the client was subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for VCS and CDM validation and verification.

The verification team and the technical reviewers consist of the following personnel.

Role	Last Name	First Name	Country
Team Leader	Carvalho	Thaís	Brazil
Verifier	Oliva	Rafael	Brazil
Technical Expert	Menon	Rekha	India
Technical Reviewer	Valoroso	Rita	Italy

1.4 Summary Description of the Project

The project replaces the baseline Animal Waste Management Systems (AWMS) by a lower GHG emitting AWMS. All farms included in the project are located in the State of Santa Catarina, in the south region of Brazil.

By replacing the baseline system, the present project activity reduces methane emissions from anaerobic decay through composting, which is a controlled aerobic treatment.

As part of this project, animal waste is treated in a mechanized composting unit, where the liquid wastes are incorporated with dry solid substrate to be submitted to the mechanical stirring process. This process mixes the liquid and solid parts, maintaining appropriate levels of oxygen, moisture content, and temperature to ensure that organic matter degradation occurs under aerobic conditions. The final compost obtained is used to fertilize cultivated soil within each farm, or sold to local consumers

Besides reducing GHG emissions, the project activity promotes other benefits, such as: improvement of health and working conditions; enhancement of the organic matter stabilization for later soil application; reduction of surface runoff risks from animal manure, which also reduces soil leaching and river pollution; odor reduction, thus combating vector proliferation; income distribution; access to innovative technology; capacity building of the people involved in the project; encouragement of regional integration and development of similar projects with a view to sustainable development.

The main information of the project activity is summarized in the table below:

Project Participant(s)	Sustainable Carbon – Projetos Ambientais Ltda Fazenda Sitio Pickler

	Fazenda Suruvy Fazenda Altenor Fazenda Helena Fazenda Gilmar Fazenda Granja Silva Fazenda Pissaia Fazenda Andretta Fazenda Ramela Sítio Santa Lucia Fazenda Colônia Zuffo Fazenda Colônia Suspiro Fazenda Baccin		
Project Title	Composting Project in Santa Catarina		
Location of the project	State of Santa Catarina Cities: • Arroio Trinta • Arvoredo • Concórdia • Herval d'Oeste • Jaborá • Nova Erechim • Nova Itaberaba • Rio das Antas • Vargeão		
Methodology(ies)	AMS-III.F. – Avoidance of methane emissions through composting, version 10. AMS-III.D. – Methane recovery in animal manure management systems, version 18.		
Sectoral Scope(s)	13	RINA's Technical Area(s)	13.2
Registered PDD	version 06.1 of 10/01/2014		
Starting date of the crediting period	01/01/2011		
Project's crediting period	01/01/2011 to 31/12/2020		
Project documentation link	VCS project page available at < http://www.vcsprojectdatabase.org/#/project_details/1144> accessed on 14/09/2015		

2 VERIFICATION PROCESS

The project was validated by Designated Operational Entity TÜV Rheinland (China) Ltd (validation report N° 2793.11.A.0 issued on 06/02/ 2014) and it was registered under the VCS

registration reference N° 1144. This is the second verification assessment for the monitoring period 01/01/2013 to 30/06/2015 by RINA.

2.1 Method and Criteria

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Requirements, i.e. VCS Program Guide, VCS Version 3 (v3.5), Requirements Document of 08/10/2013 and VCS Standard, VCS Version 3 (v3.4), Requirements Document of 08/10/2013. The GHG emission reductions are based on the approved Baseline and monitoring methodologies:

- AMS-III.F. – "Avoidance of methane emissions through composting", version 10.
- AMS-III.D. – "Methane recovery in animal manure management systems", version 18

The verification consisted of the following three phases

- Document review;
- On-site assessment including Interviews and Site Inspections;
- Resolution of Any Material Discrepancy and the issuance of the final verification report and certification.

The following sections outline each step in more detail.

2.2 Document Review

The monitoring report (MR) version 2 of 26/11/2015 and previous version 1.0 of 21/08/2015 /01/, the emission reduction calculations spreadsheet (VCS MR Calculations_period 02_01 01 2013_30 06 2015_v2.xlsx) of 26/11/2015 and previous version /03/, were assessed as part of the verification. In addition the registered Project Design Document (VCS PD) /02/ in particular the baseline estimations and the monitoring plan for the project were reviewed.

/01/	Sustainable Carbon – Projetos Ambientais Ltda: VCS monitoring report for the project activity "Composting Project in Santa Catarina", version 2 of 26/11/2015 version 1.0 of 21/08/2015 for the monitoring period 01/01/2013 to 30/06/2015
/02/	Sustainable Carbon – Projetos Ambientais Ltda: Registered VCS project description for project activity "Composting Project in Santa CatarinaComposting Project in Santa Catarina" in Brazil, version 06.1 of 10/01/2014
/03/	Sustainable Carbon – Projetos Ambientais Ltda: Emission Reduction spreadsheet titled "VCS MR Calculations_period 02_01 01 2013_30 06 2015_v2.xlsx " version 2 of 26/11/2015 "VCS MR Calculations RESUME_period_02_01 01 2013_30 06 2015_v1" version 01 of 21/08/2015
/04/	VCS: VCS Program Guide, VCS Version 3 (v3.5), Requirements Document of 08/10/2013
/05/	VCS: VCS Standard, VCS Version 3 (v3.4), Requirements Document of 08/10/2013
/06/	CDM Executive Board: Approved consolidated baseline and monitoring methodologies: - AMS-III.F. - "Avoidance of methane emissions through composting", version 10, dated 18/02/2011. - AMS-III.D. – "Methane recovery in animal manure management systems", version 18,

	dated 29/09/2011.
/07/	VCS: Monitoring report form (MONITORING REPORT: VCS Version 3) , version 03.3 dated 08/10/2013
/08/	VCS project page available at <http://www.vcsprojectdatabase.org/#/project_details/1144> accessed on 14/09/2015
/09/	Designated Operational Entity TÜV Rheinland (China) Ltd (validation report N° 2793.11.A.0 issued on 06/02/2014)
/10/	Designated Operational Entity TÜV Rheinland (China) Ltd (verification report N° 01 997 9105076523 , version no. 04, issued on 24/07/2014)
/11/	Documents of swine production provided by integrators: 1. Alterno José Basso: • SEARA - Swine production statement – issued on 28/05/2013 • SEARA - Swine production statement – issued on 30/10/2013 • SEARA - Swine production statement – issued on 31/03/2014 • SEARA - Swine production statement – issued on 25/08/2014 • SEARA - Swine production statement – issued on 23/01/2015 2. Antonio Carlos Ramella: • Coperaguas Cooperativa Agroindustrial - Swine production statement – issued on 13/07/2013. • CIDASC - Swine production statement – issued on October/2014 • CIDASC - Swine production statement – issued on March/2015 • CIDASC - Swine production statement – issued on July/2015 • CIDASC - Swine production statement – issued on 15/09//2015 3. Clodoaldo Secco: • BRF – Brasil Foods S.A. - Swine production statement – issued on 15/04//2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 23/08/2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 08/01//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 17/06//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 27/10//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 10/03//2015 4. Dario Zuffo: • COOPERVIL - Swine production statement – issued on 08/05/2013 • COOPERVIL - Swine production statement – issued on 19/09/2013 • COOPERVIL - Swine production statement – issued on 28/01/2014 • COOPERVIL - Swine production statement – issued on 03/07/2014 • COOPERVIL - Swine production statement – issued on 05/11/2014 • COOPERVIL - Swine production statement – issued on 13/03/2015 • COOPERVIL - Swine production statement – issued on 14/08/2014 5. Diacir Coradi • Suicooper Aurora - Swine production statement – issued on 04/04/2013 • Suicooper Aurora - Swine production statement – issued on 15/07/2013 • Suicooper Aurora - Swine production statement – issued on 21/08/2013 • Suicooper Aurora - Swine production statement – issued on 10/12/2013 • Suicooper Aurora - Swine production statement – issued on 17/01/2014

	• Suicooper Aurora - Swine production statement – issued on April/2015 • Suicooper Aurora - Swine production statement – issued on December/2014 • Suicooper Aurora - Swine production statement – issued on July/2015 6. Gilmar Piovesan: • BRF – Brasil Foods S.A. - Swine production statement – issued on 09/05//2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 23/09/2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 12/02//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 23/06//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 31/10//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 21/03//2015 • BRF – Brasil Foods S.A. - Swine production statement – issued on 24/07//2015 7. Gilmar José Sinigaglia • BRF – Brasil Foods S.A. - Swine production statement – issued on 07/02/2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 26/06/2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 04/11/2013 • BRF – Brasil Foods S.A. - Swine production statement – issued on 11/03//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 14/08//2014 • BRF – Brasil Foods S.A. - Swine production statement – issued on 20/01//2015 • BRF – Brasil Foods S.A. - Swine production statement – issued on 21/05//2015 8. Jair da Silva • COOP PROD CONS CDIA – Swine production statement – issued on 13/08/2015 9. Nóbile Tomazzi • SEARA - Swine production statement – issued on 17/01/2013 • SEARA - Swine production statement – issued on 15/07/2013 • SEARA - Swine production statement – issued on 14/01/2014 • SEARA - Swine production statement – issued on 14/07/2014 • SEARA - Swine production statement – issued on 27/01/2015 • SEARA - Swine production statement – issued on 07/08/2015 10. Renato Baccin • SEARA - Swine production statement – issued on 17/10/2012 • SEARA - Swine production statement – issued on 05/04/2013 • SEARA - Swine production statement – issued on 09/10/2013 • SEARA - Swine production statement – issued on 12/12/2013 • SEARA - Swine production statement – issued on 31/01/2014 • SEARA - Swine production statement – issued on 31/07/2014 • SEARA - Swine production statement – issued on 06/02/2015 • SEARA - Swine production statement – issued on 30/07/2015 11. Selvino Andretta • Perdigao Agroindustrial S.A. – Swinw production statement – issued on 03/09/2015
/12/	Project sites internal control of swine production and composting. 12. Alterno José Basso: • Pump drive control – from 01/01/2013 to 30/06 /2013

	• Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 13. Antonio Carlos Ramella: • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 14. Clodoaldo Secco: • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 15. Dario Zuffo: • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 16. Diacir Coradi • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 17. Gilmar Piovesan: • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 18. Gilmar José Sinigaglia • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 19. Jair da Silva • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 20. Nóbile Tomazzi • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 21. Renato Baccin • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014 22. Selvino Andretta • Pump drive control – from 01/01/2013 to 30/06 /2013 • Temperature and humidity control of the composting –from 01/02/2013 to 12/12/2014
/13/	Brazilian DNA (Interministerial Commission on Global Climate Change – Comissão Interministerial de Mudança Global do Clima - CIMGC), Emission factor of the Brazilian grid Data for 2014 available in portuguese at: http://www.mct.gov.br/upd_blob/0237/237010.htm Accessed on 17/09/2015.

	Data for 2013 available in Portuguese at: http://www.mct.gov.br/upd_blob/0231/231258.htm Accessed on 17/09/2015.
/14/	EMBRAPA, Production and Management of Swine Wastes (original name in Portuguese: Produção e Manejo de Dejetos de Suínos). Available in Portuguese at: http://www.cnpsa.embrapa.br/pnma/pdf_doc/8-PauloArmando_Producao.pdf Accessed on 17/09/2015
/15/	2006 IPCC Guidelines for National Greenhouse Gas Inventories.
/16/	Environmental Foundation (FATMA) Operating licenses: 1. Altenor José Basso n.º 11259/2013 –Valid until 13/12/2017 2. Antoni Carlos Ramella n.º 5455/2014 – Valid until 13/08/2018 3. Clodoaldo Antônio Secco n.º 8123/2014 – Valid until 10/11/2018 4. Dario Marcos Zuffo n.º 7974/2014 – Valid until 2018 5. Leocimar e Diacir Coradi n.º 4790/2011 – Valid until 04/09/2015 6. Gilmar Piovesan n.º 4122/2011 – Valid until 21/01/2015 7. Gilmar José Sinigaglia n.º 4905/2015 – Valid until 2019 8. Jair da Silva n.º 4411/2011 – Valid until 28/07/2015 9. Nóbile Tomazzi n.º 581/2015 – Valid until 12/02/2019 10. Renato Baccin n.º 8121/2012 – Valid until 02/09/2016 11. Selvino Luiz Andreta n.º 6792/2011 – Valid until 26/09/2015
/17/	CDM Executive Board "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 01 of 16/05/2008
/18/	LPC Report- Judgment about the expected time of operation of the manure pump and the UMAC equipment.
/19/	Sustainable Carbon – Projetos Ambientais Ltda: Emission Reduction spreadsheets Version 2 of 26/10/2015 - VCS MR Calculations Altenor Farm_period 02_01 01 2013_30 06 2015_v2.xls - VCS MR Calculations Andretta Farm_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Baccin Farm_period 02_01 01 2013_30 06 2015_v2.xls - VCS MR Calculations Colonia Suspiro_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Colonia Zuffo_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Gilmar Farm_period 02_01 01 2013_30 06 2015_v2.xls - VCS MR Calculations Granja Silva Farm_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Helena Farm_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Ramella Farm_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Sitio Santa Lucia_period 02_01 01 2013_30 06 2015_v2.xls -VCS MR Calculations Suruvy Farm_period 02_01 01 2013_30 06 2015_v2.xls Version 1 of 21/08/2015 titled: - VCS MR Calculations Altenor Farm_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Baccin Farm_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Colonia Suspiro_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Colonia Zuffo_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Granja Silva Farm_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Helena Farm_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Ramella Farm_period 02_01 01 2013_30 06 2015_v1

	- VCS MR Calculations Sitio Santa Lucia_period 02_01 01 2013_30 06 2015_v1 - VCS MR Calculations Suruvy Farm_period 02_01 01 2013_30 06 2015_v1
/20/	ACOPERFIL INDUSTRIA E COMERCIO DE ACO - Maintenance equipment purchase note n.º 000075243, from 01/07/2015
/21/	EMBRAPA scientific study – *Produção e Manejo de Desejtos Suínos* (Swine manure and produtuion). Paulo Armando V. de Oliveira. Not Dated.
/22/	LPC Tecnologia Ambiental, Training Records from 07/05/2012 to 11/05/2012; and Training Programme.
/23/	National Institute of Meteorology (Instituto Nacional de Meteorologia – INMET). Available in portuguese at: <http://www.inmet.gov.br/portal/index.php?r=clima/normaisClimatologicas>. Insert the following information to compose the graphic: Temp. Méd. Compensada (℃) and at Annual basis. Accessed on 17/09/2015.
/24/	Intergovernmental Panel on Climate Change - IPCC (2014)
/25/	Scientific Study in Portuguese: OLIVEIRA, Paulo Armando V. de. **Produção e manejo de dejetos de suínos**. Concórdia: Embrapa, 2003. 83 p

2.3 Interviews

The key personnel interviewed and the main topics of the interviews are summarized in the table below:

	Date	Name and Role	Organization	Topic
/a/	01/09/2015	Mr. Antônio Carlos Ramela Mr. Gilmar Matana	Fazenda Ramela	Data for the social carbon and VCS report
/b/	01/09/2015	Mr. Belmirro Secco Mr. Pedro Cardoso	Sítio Santa Lúcia	Data for the social carbon and VCS report
/c/	01/09/2015	Mr. Jair da Silva	Fazenda Granja Silva	Data for the social carbon and VCS report
/d/	01-03/09/2015	Mr. Marcel Haddad - Sustainability coordinator	Sustainable Carbon	Social carbon and VCS report development
/e/	02/09/2015	Mr. Dario Zuffo	Fazenda Colônia Zuffo	Data for the social carbon and VCS report
/f/	02/09/2015	Mr. Nóbile Tomazi Ms. Lenice Tomazi	Fazenda Colônia Suspiro	Data for the social carbon and VCS report
/g/	02/09/2015	Mr. Altenor Basso	Fazenda Altenor	Data for the social carbon and VCS report
/h/	02/09/2015	Mr. Diacir Coradi	Fazenda Helena	Data for the social carbon and VCS report
/i/	03/09/2015	Mr. Renato Baccin	Fazenda Baccin	Data for the social carbon and VCS report
/j/	03/09/2015	Mr. Airton Piovezan	Fazenda Suruvy	Data for the social carbon and VCS report
/k/	03/09/2015	Mr. Selvino Andretta	Fazenda Andretta	Data for the social carbon

				and VCS report

2.4 Site Inspections

On 01-03/09/2015, RINA visited the following farms sites in Santa Catarina, Brazil:

- *Fazenda Ramela*
- *Sítio Santa Lúcia*
- *Fazenda Granja Silva*
- *Fazenda Colônia Zuffo*
- *Fazenda Colônia Suspiro*
- *Fazenda Altenor*
- *Fazenda Baccin*
- *Fazenda Suruvy*
- *Fazenda Andretta*
- *Fazenda Gilmar*

During the on-site assessment of the project, there were no hindrance and all the equipment's and the systems were accessible. RINA assessed:

- The implementation and operation of the proposed project activity;
- Reviewed the information flows for generating, aggregating and reporting the monitoring parameters;
- Interviewed key personnel of the plant to confirm the operational and data collection procedures;
- Cross-checked between information provided in the monitoring report and data plant;
- Checked the monitoring equipment;
- Reviewed calculations and assumptions made in determining the GHG data and emission reductions;
- Checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters

Rina assessed *Fazenda Helena* through documentation from integrators /11/, internal control of the swine production /12/, Operational licenses /16/ and an interview from a telephone call */k/*.

Fazenda Pissaia and *Fazenda Sitio Pickler* were not included in the current monitoring report following a personal decision from farm owners. The current operational status of the project in these farms is unknown.

2.5 Resolution of Findings

The objective of this phase of the verification is to resolve any outstanding issues, which need to be clarified for RINA's positive conclusion on the monitoring report and emission reductions.

To guarantee transparency a verification protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of verification and the results from verifying the identified criteria. The verification protocol consists of three tables; the different columns in these tables are described in the figure below (see Figure 1). The completed verification protocol is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;

- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions;

- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements, which refer to CDM rules, have been met.

CARs, CRs identified are included in the verification protocol in Appendix A of this report.

Figure 1 Verification protocol tables

Verification Protocol, Table 1 - Requirement checklist					
Checklist Question	**Ref.**	**MoV**	**Comments**	**Draft Conclusion**	**Final Conclusion**
Checklist questions organized in seven different sections.	Makes reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples are document review (DR), interview or any other follow-up actions (I), cross checking (CC) with available information relating to projects, (N/A) means not applicable.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with checklist question so far.	For CAR, CR and FAR see the definitions above.	OK is used if the information and evidence provided is adequate to demonstrate compliance with VCS requirements which refer to CDM rules.

Verification Protocol, Table 2: Resolution of Corrective Action Requests and Clarification			
Corrective action requests and/or clarification requests	**Reference to Table 1**	**Response by project participants**	**Verification Conclusion**
The CAR and/or CRs raised in table 1 are repeated	Reference to the checklist question number in Table 1 where the CAR or CR is explained.	The responses given by the project participants to address the CARs and/or CRs.	The verification team's assessment and final conclusion of the CARs and/or CRs.

here.			

Verification Protocol, Table 3 - Forward Action Requests		
Forward action request	**Reference to Table 1**	**Response by project participants Verification Conclusion**
The FAR raised in table 1 is repeated here.	Reference to the checklist question number in Table 1 where the FAR is explained.	Response by the project participants on how forward action request will be addressed.

2.5.1 Forward Action Requests

In the previous monitoring period, no FAR was raised in the verification report /10/:

2.6 Eligibility for Validation Activities

The project activity is registered under VCS registration reference Number 1144 /1/, hence this section is not applicable.

3 VALIDATION FINDINGS

The project was validated by Designated Operational Entity TÜV Rheinland (China) Ltd (validation report N° 2793.11.A.0 issued on 06/02/2 014) and it was registered under the VCS registration reference No-1144. This is the second verification assessment for the monitoring period 01-January-2013 to 30-June-2015 by RINA.

3.1 Participation under Other GHG Programs

Not applicable.

3.2 Methodology Deviations

As described in the VCS PD version 06.1, there is a deviaton to the equation used for determining the annual average number of animals of type *LT* in year *y* (parameter $N_{LT,y}$)[1]. This deviation increases the accuracy of emission reduction quantification, since it allows PPs to use reliable third party information /11/ to monitor key parameters related to animal production.

This deviation maintain the conservativeness of the quantification of GHG emission reductions or removals; instead, it increases the accuracy of monitoring and emission reduction calculations, as described above. Moreover, this deviation only relates to the criteria and procedures for monitoring or measurement, and does not relate to any other part of the applied methodology.

Project Proponents have also used a deviation in the monitoring of the quantity of electricity consumed by the project, which is related to emissions from electricity consumption. AMS-III.F version 10 determines it

[1] Please check equation 4 on Section 3.1 of the VCS PD.

shall be assumed that all relevant electrical equipment operate at a full rate capacity, plus 10% to account for distribution losses, for 8,760 hours per year in case electricity consumption is not directly monitored.

However, given the farms management processes and their low energy consumption, a conservative value was applied. Such value is based on monitored data collected in part of this monitoring period and on LPC judgment /18/ about the expected time of operation of the manure pump and the UMAC equipment[2], which are the two only equipment demanding electricity consumption in the AWMS. Values applied on the emission reduction calculation were conservatively defined as the highest value from either:

- LPC judgement corrected with the use of a conservative factor of 125%, meaning an operation time 25% higher than expected by LPC; or
- The average operation time of each AWMS equipment, which was monitored by each farmer during part of the monitored period.

This estimate is also considered conservative given that electricity is a significant cost for the operation of the composting unit and farmers would have no interest in using the equipment longer than necessary.

This deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals, since conservative estimated values were applied in case monitoring data was incomplete[3]. Moreover, this deviation only relates to the criteria and procedures for monitoring or measurement, and does not relate to any other part of the applied methodology.

Project Proponents have also used a deviation regarding the monitoring of the quantity of manure treated in the year *y* (parameter Q_y) and the quantity of compost produced in year *y* (parameter $Q_{y,treatment}$). The applied version of the methodology establishes these parameters should be monitored by on-site data measurement using weighbridges. However, the project does not involve the transportation of waste by vehicles[4] and the compost is mostly used as fertilizer within the farm or on nearby farms, where weighbridges are not available.

Project Proponents have proposed to determine the amount of waste composted by monitoring the number of operating hours of the pump that sends manure to the composting unit and/or applying default values. However, as data were incomplete, a conservative value was applied based on monitored data collected in part of this monitoring period and on a scientific study about the quantity of swine manure produced per animal type per day. Values applied on the emission reduction calculation were conservatively defined as the highest value of:

- Embrapa study[5] /25/; or
- The average quantity of manure treated per day monitored by each farmer during part of the monitored period.

[2] Estimates from LPC took into consideration the design of each individual farm. Estimates were based on the size of each composting site and the typical operating conditions of the UMAC system.
[3] Evidence on the expected time of operation of electric equipments of each farm was provided to the Validation and Verification Body responsible for project verification.
[4] Waste is carried to composting units by gravity and electrical pumps. Compost is usually removed with wheelbarrow or small vehicles (tractors). This is applicable to all farms included in the project.
[5] OLIVEIRA, Paulo Armando V. de. **Produção e manejo de dejetos de suínos**. Concórdia: Embrapa, 2003. 83 p. Information taken from Table 1. Value adopted to the current monitoring for the amount of solid waste (in kilogram): average daily production of swine manure, including manure and urine, according to animals weight.

Since this parameter is only used to calculate project emissions, using default values is conservative as long as values are higher than monitored data. Also, the CDM Methodological Tool "Project and leakage emissions from composting" (EB 65 Annex 09) allows for a different procedure in case there are no weighing device. The tool recommends estimating the amount of waste based on the number of trucks and their capacity. Under this option, no direct measurement or calibrated equipment are used for the monitoring of the amount waste composted.

Also, since no project emissions from the produced compost are expected, this deviation will not negatively impact the conservativeness of the quantification of GHG emission reductions or removals, as a conservative approach was chosen to monitor *Qy* and Qy,treatment. The approach is considered conservative since it is based either on on-site data or on reliable EMBRAPA /25/ default values that are applicable to local conditions. Moreover, this deviation is only related to criteria and procedures for monitoring or measurement, and does not relate to any other part of the methodology.

3.3 Project Description Deviations

There were no project description deviations during this monitoring period.

3.4 Grouped Project

This project is not a grouped project. Hence, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

An onsite visit was performed on 01-03/09/2015 to verify the real implementation of the project against the description in the registered VCS PD.

Rina confirmed the implementation and operation of the proposed project activity at farm sites, as described in the VCS-PD. Verified during the onsite the use of a mechanized composting unit at the farms sites. However, 3 farms operated anaerobic lagoons during the current monitoring period (Gilmar Farm, Helena Farm and Colônia Suspiro Farm), the Project emissions were calculated for these farms accordingly.

Fazenda Pissaia and *Fazenda Sitio Pickler* were not included in the current monitoring report following a personal decision from farm owners. The current operational status of the project in these farms is unknown.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

In accordance with the applied methodologies AMS-III.F. - "Avoidance of methane emissions through composting", version 10 and AMS-III.D. – "Methane recovery in animal manure management systems", version 18, the emission reductions is calculated as baseline emissions (BEy) minus project emissions (PEy).

Baseline emissions

Baseline emissions are calculated according to AMS-III.F. Version 10, paragraph 14. According to such paragraph of the methodology, baseline emissions are calculated as:

$$BE_y = BE_{CH4,SWDS,y} + BE_{ww,y} + BE_{CH4,manure,y} - MD_{y,reg} * GWP\_CH_4$$

$$\mathbf{ER_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossilfuel}}$$ (Equation 01)

Where:

$BE_{CH4,SWDS,y}$ Yearly methane generation potential of the solid waste composted by the project activity during the years x from the beginning of the project activity (x=1) up to the year y estimated as per the latest version of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" (tCO_2e). The tool may be used with the factor "f=0.0" assuming that no biogas is captured and flared. With the definition of year x as 'the year since the project activity

started diverting wastes from landfill disposal, x runs from the first year of crediting period (x=1) to the year for which emissions are calculated (x=y)'

$MD_{y,reg}$	Amount of methane that would have to be captured and combusted in the year y to comply with the prevailing regulations (tonne)
$BE_{CH4,manure,y}$	Baseline emissions from manure composted by the project activities, as per the procedures of AMS-III.D
$BE_{ww,y}$	Where applicable, baseline emissions from the wastewater co-composted, calculated as per the procedures in AMS-III.H
GWP_CH_4	GWP for CH4

Only baseline emissions from animal manure composted by the project activities are considered. Hence, baseline emissions are calculated in accordance to procedures from approved methodology AMS-III.D, version 18. Procedures from paragraph 9(a) are used, since data needed to apply option 9(b) is not available.

The baseline emissions are calculated by Equation 2 below:

$$BE_y = GWP_{CH4} * D_{CH4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{BI,j}$$

$$\mathbf{B_y = PR_y \times BF_y} \qquad \text{(Equation 02)}$$

Where:

BE_y	Baseline emissions in year y (tCO_2e)
GWP_{CH4}	Global Warming Potential (GWP) of CH_4
D_{CH4}	CH_4 density (0.00067 t/m³ at room temperature (20 ºC) and 1 atm pressure)
LT	Index for all types of livestock
j	Index for animal manure management system
MCF_j	Annual methane conversion factor (MCF) for the baseline animal manure management system j
$B_{0,LT}$	Maximum methane producing potential of the volatile solid generated for animal type LT (m^3 CH4 / kg dm)
$N_{LT,y}$	Annual average number of animals of type LT in year y (numbers)
$VS_{LT,y}$	Volatile solids for livestock LT entering the animal manure management system in year y (on a dry matter weight basis, kg dm/animal/year)

$MS\%_{BL,j}$	Fraction of manure handled in baseline animal manure management system j
UF_b	Model correction factor to account for model uncertainties (0.94)

The value of $VS_{LT,y}$ is adjusted according to the average animal weight of project activity, by means of Equation 3 below, considering the default value of IPCC ($VS_{default}$):

$$VS_{LT,y} = \left(\frac{W_{site}}{W_{default}}\right) * VS_{default} * nd_y \quad \mathbf{HG_{p,y} = SGE \times PR_y} \quad \text{(Equation 03)}$$

Where:

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, this data is sourced from 2006 IPCC (kg)
$VS_{default}$	Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population (kg dm/animal/day)
nd_y	Number of days in year y where the animal manure management system is operational.

The average number of animals (N LT,y) is calculated by Equation 4:

$$N_{LT,y} = N_{da,y} * \left(\frac{N_{p,y}}{365}\right) \quad \mathbf{\eta_{old} = \frac{SGE}{SFE}} \quad \text{(Equation 04)}$$

Where:

N_{day}	Number of days animal is alive in the farm in the year y (numbers)
$N_{p,y}$	Number of animals produced annually of type LT for the year y (numbers)

Rina has crosschecked the values presented with the documents provided by integrators /11/ and the data in the VERs spreadsheet /03/, and verified the correct adequacy of the monitored parameters reported. Some errors were identified during the cross check. PP corrected the errors accordingly.

Rina has also crosschecked third part information from LPC /18/ against the farmers internal control /12/ and interviews during site visit, in order to ensure that the most conservatively value was used in the spreadsheet to calculate the VERs /03/.

Project emissions

According to the methodology AMS-III.F., version 10, project activity emissions consist of:

(i). CO_2 emissions due to the incremental transportation distances;

(ii). CO_2 emissions from electricity and/or fossil fuel consumption by the project activity facilities;

(iii). Methane emissions during composting process;

(iv). Methane emissions from runoff water; and

(v). Methane emissions due to compost storage.

The equation for project emission calculation is:

$$\eta_{old} = \frac{SGE}{SFE} \quad PE_y = PE_{y,transp} + PE_{y,power} + PE_{y,comp} + PE_{y,runoff} + PE_{y,res\ waste}$$

(Equation 05)

Where:

PE_y	Project activity emissions in the year y (tCO_2 e)
$PE_{y,transp}$	Emissions from incremental transportation in the year y (tCO_2e)
$PE_{y,power}$	Emissions from electricity or fossil fuel consumption in the year y (tCO_2e)
$PE_{y,comp}$	Methane emissions during composting process in the year y (tCO_2e)
$PE_{y,runoff}$	Methane emissions from runoff water in the year y (tCO_2e)
$PE_{y,res\ waste}$	In case produced compost is subjected to anaerobic storage or disposed in a landfill: methane emissions from the anaerobic decay of the residual organic content (tCO_2e)

Among the project emissions listed by the methodology AMS-III.F., version 10, the proposed project activity will not produce emissions referring to the consumption of fossil fuels, emissions due to incremental transportation distances, emissions due to runoff water, and emissions related to compost storage. This is justified by the following:

- ✓ There is no fossil fuel consumption by the equipment installed as part of the project; the project will not result in additional transportation of waste or compost;

- ✓ The project results in a significant reduction in the volume of treated manure, since the composting process evaporates most of the water content on the treated manure. This reduction in volume also reduces associated consumption of fossil fuels for its transportation until final destination;
- ✓ The mechanized composting units are automated and designed to not apply excessive wastes on the substrate. In addition, sheds are covered, avoiding rainwater percolation onto the substrate. Any runoff water is recirculated into the composting mass;
- ✓ Finally, the compost is not stored in anaerobic conditions nor sent to landfills. Thus, the equation to be applied to determine project activity emissions takes the following structure:

$$\eta_{old} = \frac{SGE}{SFE} \quad PE_y = PE_{y,power} + PE_{y,comp}$$

(Equation 06)

a) Emissions from electricity or fossil fuel consumption in the year y ($PE_{y,power}$)

Emissions from grid electricity consumed by the project are determined according to the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 01 of 16/05/2008 /17/. Emissions from electricity are calculated as the product of the energy consumed by the CO_2 emission factor of the grid, according to the equation below:

$$PE_{y,power} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y}) \quad \eta_{old} = \frac{SGE}{SFE}$$

(Equation 07)

Where:

$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year y (tCO_2/MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y

Therefore, $PE_{y,power}$ (as defined on Equation 6, above) is equal to $PE_{EC,y}$ as provided by the referred tool. Please note that in Equation 7 the term $PE_{EC,y}$ was replaced by $PE_{y,power}$ to ensure consistency with the applied methodology. The quantity of electricity consumed by the project activity on each farm ($EC_{PJ,j,y}$) is determined considering the combined power capacity of the all equipment in the mechanized composting unit and a conservative estimate on the time of operation of each equipment.

All farms included in the present project consume electricity exclusively from the grid. Grid emission factors shall be calculated through the Brazilian combined margin (CM) emission factor ($EF_{grid,CM,y}$),

which is based on a weighted average of the Build Margin and the Operating Margin, using a 0.5 weight for each parameter, in accordance with procedures described in version 18 of AMS-III.D. Both parameters are calculated by the Brazilian DNA (Interministerial Commission on Global Climate Change – Comissão Interministerial de Mudança Global do Clima - CIMGC) /13/. Thus, the Brazilian combined margin emission factor ($EF_{grid,CM,y}$) is calculated through the equation below:

$$EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM} \quad \eta_{old} = \frac{SGE}{SFE}$$

(Equation 08)

Where:

$EF_{grid,CM,y}$: Combined margin CO_2 emission factor in year y (tCO_2 /MWh)

$EF_{grid,OM,y}$: Operating margin CO_2 emission factor in year y (tCO_2/MWh)

W_{OM}: Weighting of operating margin emissions factor (%)

$EF_{grid,BM,y}$: Build margin CO_2 emission factor in year y (tCO_2/MWh)

W_{BM}: Weighting of build margin emissions factor (%)

Furthermore, according to Table III.F.1, paragraph 27 of methodology AMS-III.F., version 10, TDL j,y is defined as 10%.

b) Methane emissions during composting process in the year y ($PE_{y,comp}$)

Methane emissions generated during the composting process ($PE_{y,comp}$) are determined according to Equation 9 below:

$$PE_{y,comp} = Q_y * EF_{composting} * GWP\_CH_4 \quad \eta_{old} = \frac{SGE}{SFE}$$

(Equation 09)

Where:

Q_y: Quantity of raw waste/manure treated in the year y (tonnes)

$E_{composting}$: Emission factor for composting of manure (tCH_4/ton waste treated). Emission factors can be based on site measurements, country specific values or IPCC default values (table 4.1, chapter 4, Volume 5, 2006 IPCC Guidelines for National Greenhouse Gas Inventories). IPCC default values are 10 gCH_4/kg waste treated on a dry basis and 4 gCH_4/kg waste treated on a wet basis. $EF_{composting}$ can be set zero in case the monitored oxygen content during of the composting process within the windrow is above 8%.

During the current monitoring period, $EF_{composting}$ was considered as 4 gCH_4/kg of waste treated on a wet basis, sourced from 2006 IPCC as referred in the methodology. This approach was taken since the level of oxygen in the composting windrows had not been monitored.

The quantity of raw manure treated per year (Q y) was monitored by registering the operating hours of the pump that destine the manure from the storage tank to the composting unit. Nevertheless, during the current monitoring period, default values of animal waste production had also to be used to obtain the quantity of manure treated, since monitoring data was incomplete. The most conservative value was applied for calculating GHG emission reductions, as described above in Section 3.2 – Data and Parameters Monitored.

$$Q_y = P_{NF} * P_{TO,y} * MD * 0.7 \quad \eta_{old} = \frac{SGE}{SFE}$$ (Equation 10)

Where:

P_{NF}	Pump nominal flow (m^3/hour)
$P_{TO,y}$	Pump time of operation in year y (hours)
MD	Manure density (tonnes/m^3)
0.7	Fraction of waste from confinement that is manure

For the values presented in the monitoring period, please, refer to the verification protocol in Appendix A.

Rina confirmed the implementation and operation of the proposed project activity at farm sites, as described in the VCS-PD. Verified during the onsite the use of a mechanized composting unit at the farms sites. However, three farms operated anaerobic lagoons during the current monitoring period (Gilmar Farm, Helena Farm and Colônia Suspiro Farm). PP calculated the project emissions for these farms accordingly.

Leakage

As the project does not involve equipment transference from another activity, there is no leakage to be considered, according to methodology AMS-III.F., version 10.

Net GHG Emission Reductions and Removals

According methodology AMS-III.F., version 10, GHG emission reductions achieved by the project activity are calculated as the difference between the baseline emissions and the project emissions, as described below:

$$ER_y = BE_y - PE_y \quad \eta_{old} = \frac{SGE}{SFE}$$ (Equation 10)

Where,

ER_y	Emission reduction in year y (tCO_2e)
BE_y	Baseline emissions in year y (tCO_2e)
PE_y	Project activity emissions in the year y (tCO_2e)

RINA verified that the emission reduction (ER) is calculated conservatively. In the VERs spreadsheet the Baseline emissions (BE) is rounded down and the Project activity emissions (PE) is rounded up.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

During the onsite visit RINA verified that the Farms sites has adequate monitoring mechanisms and uses the required parameters to monitor on a monthly basis.

The main parameters controlled by the PP came from document from integrators /11/, referent to swine production. Monitored data from the swine batches are transferred to a spreadsheet /03/ that is used to input data in the VERs spreadsheet /03/. During the onsite visit RINA has cross checked the original documents /11/ against the spreadsheet /03/ to confirm the correct data transference. PP are responsible for the monitoring of the parameters. There is a spreadsheet where data is described and this spreadsheet /03/ is the basis for the VERs calculation /03/.

The MR describes that data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

The following parameters were available at validation as per the registered VCS PD/02/ and the validation report /09/:

DATA/PARAMETER Unit	Source of data	Reported value for the project period	Assessment/Observation
Annual average temperature Annual average temperature at project site/ºC	Registered PD describes that was taken from the National Institute of Meteorology (Instituto Nacional de Meteorologia – INMET) /23/	18	RINA verified, it is in accordance with the value described in the registered PD /02/ and National Institute of Meteorology /23/
GWP_{CH4} Global Warming Potential of CH_4/ tCO_2e/tCH_4	VCS MR describes describes that it was taken from Intergovernmental Panel on Climate Change - IPCC (2014) /24/.	25	RINA verified that the value applied is in accordance with the registered MR and it corresponds to the Intergovernmental Panel on Climate Change - IPCC (2014) /24/.
DCH_4 Density of CH_4/ t/m^3	Registered VCS PD /02/ describes that it was taken from Methodology AMS-III.D., version 18 /06/	0.00067	RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the Methodology AMS-III.D., version 18 /06/, applicable to the project activity

<table>
<tr>
<td>UF_b
Correction factor to account for model uncertainties/Fraction</td>
<td>Registered VCS PD /02/ describes that it was taken from Methodology AMS-III.D., version 18 /06/</td>
<td>0.94</td>
<td>RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the Methodology AMS-III.D., version 18 /06/, applicable to the project activity</td>
</tr>
<tr>
<td>MCF_j
Annual methane conversion factor for the baseline animal manure management system j/Fraction.</td>
<td>Registered VCS PD /02/ describes that it was taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.17 /15/</td>
<td>77%</td>
<td>RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.17 /15/, applicable to the project activity</td>
</tr>
<tr>
<td>B_{0,LT}
Maximum methane producing potential of the volatile solid generated for animal type LT/ m³ CH_4/kg dm</td>
<td>Registered VCS PD /02/ describes that it was taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.A-7 and 10A-8 /15/</td>
<td>0.29 for Market Swine

0.45 for Breeding swine</td>
<td>RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.17 /15/, applicable to the project activity</td>
</tr>
<tr>
<td>MS%_{BL,j}
Fraction of manure handled in baseline animal manure management system j/%</td>
<td>The value was taken from project impametation status at each farm.</td>
<td>
<table>
<tr><th rowspan="2">Farm</th><th colspan="3">MS%_{BL,j}
From 01/Jan/2013 to 30/June/2015</th></tr>
<tr><th>2013</th><th>2014</th><th>2015</th></tr>
<tr><td>Fazenda Altenor</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Fazenda Andretta</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Fazenda Baccin</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Fazenda Colônia Suspiro</td><td>100%</td><td>100%</td><td>84%</td></tr>
<tr><td>Fazenda Colônia Zuffo</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Fazenda Gilmar</td><td>60%</td><td>60%</td><td>60%</td></tr>
<tr><td>Fazenda Granja Silva</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Fazenda Helena</td><td>100%</td><td>100%</td><td>78%</td></tr>
<tr><td>Fazenda Ramella</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Fazenda Suruvy</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>Sitio Santa</td><td>100%</td><td>100%</td><td>100%</td></tr>
</table>
</td>
<td>Some farms did maintenance on their composting system. Then part of the swine manure was not throw into the compost system.</td>
</tr>
</table>

		Lúcia	
$W_{default}$ Default average animal weight of a defined population/Kg	Registered VCS PD /02/ describes that it was taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, tables 10A-7 and 10A-8 /15/.	28 for market swine 198 for breeding swine	RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, /15/, applicable to the project activity
$VS_{default}$ Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population/ Kg dm/animal/day	Registered VCS PD /02/ describes that it was taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, tables 10A-7 and 10A-8 /15/.	0.3 for market swine 0.46 for breeding swine	RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4 /15/, applicable to the project activity
$EF_{composting}$ Emission factor for composting of manure/ gCH_4 / kg of waste treated on a wet basis	Registered VCS PD /02/ describes that it was taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 4.1, chapter 4, Volume 5 /15/	4	RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 4.1, chapter 4, Volume 5 /15/, applicable to the project activity
$TDL_{j,y}$ Average technical transmission and distribution losses for providing electricity to source *j* in year *y*/ Percentage	Registered VCS PD /02/ describes that it was taken from methodology AMS-III.F, version 10 /06/	10%	RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the Methodology AMS-III.F., version 10 /06/, applicable to the project activity
MD Manure density/ Kg/m^3	Registered VCS PD /02/ describes that it was taken from scientific study 25/.	1,016	RINA verified that the value applied is in accordance with the registered PD /02/ and it corresponds to the scientific study /25/

Parameters monitored ex post:

Data/Parameter	$VS_{LT,y}$
Data Unit	kg dm/animal/year
Description	Volatile solids for livestock *LT* entering the animal manure management system in year *y*
Source of data to be used	- IPCC default value from: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, chapter 10, tables 10 A-7 and 10 A-8; - W_{site}: Farmers, based on documents provided by integrators, State Agencies or other internal documents.
Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. RINA crosschecked with the documents provided by integrators /11. Data is transferred to a spreadsheet /19/ that is used to input data in the VERs spreadsheet /03/. During the onsite visit RINA has crosschecked the original documents /11/ against the spreadsheet /03/ to confirm the correct data transference
Monitoring equipment	No monitoring equipment is used. Since this is a default value from IPCC, it is not possible to quantify the accuracy. However, the correction of this parameter with Wsite ensures values are consistent to the project situation.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	In accordance with registered PD parameter is monitored annually. Verified during the on site visit that the parameter is controlled and registered by PP.
Calculation method (if applicable)	Calculated through Equation 3 of VCS PD v06.1, considering the average animal weight at the project site (Wsite), the default average animal weight (Wdefault) according to IPCC (2006), the default value of volatile solid excretion rate (VSdefault) also according to IPCC (2006), and the number of days the system is operational during year y (ndy).
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	nd_y

Data Unit	Days
Description	Number of days in year *y* in which the animal manure management system is operational.
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. RINA crosschecked the Project Sites internal control /12/ against third part information /11/ and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	No equipment is used to monitor this parameter. Farmers filled in paper spreadsheets or stored third party information regarding animal confinement to monitor this parameter.
Accuracy of the monitoring equipment	No equipment is used to monitor this parameter. Farmers filled in paper spreadsheets or stored third party information regarding animal confinement to monitor this parameter.
Measuring/Reading/Recording frequency	In accordance with registered PD parameter is monitored annually based on daily records (monitoring spreadsheets) or monthly records (third party information). Verified during the on site visit that the parameter is controlled and registered by PP daily, and aggregated on a monthly and yearly basis.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	W_{site}
Data Unit	Kg
Description	Average animal weight of a defined livestock population at the project site
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. The values were obtained from third party information, such as integrators that are responsible to measure animal weight for commercial purposes, in order to determine due financial

	compensations for farmers. RINA crosschecked the Project Sites internal control /12/ against third part information /11/ and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Periodic records provided by integrators for each batch. Integrators provide documents for each batch. Thus, animal weight controls do not follow an annual schedule; instead they are based on each batch period.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	$N_{da,y}$
Data Unit	Days
Description	Number of days animal is alive in the farm in the year *y*
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. The values were obtained from third party information, such as integrators that are responsible to measure the number of days animal is alive in the farm in the year for commercial purposes, in order to determine due financial compensations for farmers. RINA crosschecked the Project Sites internal control /12/ against third part information /11/ and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording	Periodic records provided by integrators for each batch.

frequency	Integrators provide documents for each batch. Thus, animal weight controls do not follow an annual schedule; instead they are based on each batch period.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	$N_{p,y}$
Data Unit	Number of animals
Description	Number of animals produced annually of type *LT* for the year *y*
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. The values were obtained from third party information, such as integrators that are responsible to measure the number of animals for commercial purposes, in order to determine due financial compensations for farmers.' RINA crosschecked the Project Sites internal control /12/ against third part information /11/ and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Periodic records provided by integrators for each batch. Integrators provide documents for each batch. Thus, animal weight controls do not follow an annual schedule; instead they are based on each batch period.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.

Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	$N_{LT,y}$
Data Unit	Number of animals
Description	Annual average number of animals of type *LT* in year *y*
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	This parameter was monitored based on parameters $N_{da,y}$ and $N_{p,y}$ previously described. Project Proponents have applied a minor deviation to the equation used for determining the annual average number of animals of type *LT* in year *y* ($N_{LT,y}$), as defined on the VCS PD version 06.1. This adaptation increases the accuracy of emission reduction calculations, since it allows PPs to use reliable third party information to monitor key parameters related to animal production. Third party information were sourced from entities that are the direct responsible for measuring monitored data, such as integrators (food companies that manage the complete meat production cycle) and State Agencies. As farms operate in batches lasting from 3 to 4 months, all data on animal production is documented by integrators after each batch is delivered. Batches and related documents do not follow a yearly calendar. RINA crosschecked the Project Sites internal control /12/ against third part information /11/ and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Annually, based on periodic records.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.

Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	$Q_{y,treatment}$
Data Unit	Tonnes
Description	Quantity of compost produced in year *y*
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Farmers monitored the amount of compost produced per year using spreadsheets /12/. RINA crosschecked the Project Sites internal control /12/ against third part information /11/ and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Annually, based on monthly records.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	$EC_{PJ,j,y}$
Data Unit	MWh
Description	Quantity of electricity consumed by the project electricity consumption source *j* in year *y*
Source of data to be used	Project proponents

Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. As predicted in the VCS PD v.06.1, farmers would record the frequency of operation of the manure pumps and of the mixing equipment (Mechanized and Automated Composting Unit - UMAC) in spreadsheets on a daily basis. These are the only two equipment demanding electricity consumption in the AWMS. The parameter was conservatively defined as the highest value of: • LPC judgment corrected with the use of a conservative factor of 125%, meaning an operation time 25% higher than expected by LPC was considered. • The average operation time of each equipment as monitored by each farmer during part of the monitored period. RINA crosschecked third part information from LPC /18/ against the farmers internal control /12/ and interviews during site visit, in order to ensure that the most conservatively value was used in the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Daily
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	$EF_{EL,j,y}$
Data Unit	tCO_2/MWh
Description	Emission factor for electricity generation for source *j* in year *y* (tCO_2/MWh)
Source of data to be used	Brazilian Designated National Authority (DNA)

Value of monitored parameter for the monitoring period	The annual emission factor for electricity consumption is described below: Year | $EF_{EL,j,y}$ (tCO_2/MWh) 2013 | 0.4322 2014 | 0.4400 2015 | 0.4400 RINA crosschecked the values with the grid emission factor obtained directly from the Brazilian DNA website /13/. Data from 2014 is the latest data available and it is used for the years 2014 and 2015.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Annually
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	Q_y
Data Unit	Tonnes (wet basis)
Description	Quantity of manure treated in the year *y*
Source of data to be used	Project Proponents
Value of monitored parameter for the monitoring period	Detailed information on Appendix 1 of the Monitoring Report. The amount of waste produced per year was monitored by registering the operating hours of the pump that destine the manure from the storage tank to the composting unit. Spreadsheets /12/ were used to record the operation time per day of manure pumps. Rina crosschecked values applied with the spreadsheet /19/

	and information from third part information /18/ (*LPC Report-Judgment about the expected time of operation of the manure pump and the UMAC equipment.)* and the spreadsheet to calculate the VERs /03/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Annually, based on monthly records
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	***Conditions of the composting process***
Data Unit	ºC for temperature; moisture level (qualitative analysis), ranging from very humid to very dry; Frequency of time for operation of the mixing equipment.
Description	Conditions of the composting process include monitoring the following parameters: temperature and moisture of the composting mass and frequency of operation of the mixing equipment (UMAC).
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Not applied for calculations. Rina checked the values using the internal control of the farmer's site /12/. Data is not directly applied in the VERs calculation /3/.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Annually, based on monthly records
Calculation method (if applicable)	Not applicable.

Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.
Calibration certificates	Calibration is not applicable.

Data/Parameter	***Soil application of the compost for agricultural purposes***
Data Unit	Numerical frequency
Description	Number of times that the compost is removed from the treatment system, providing a description of the soil application.
Source of data to be used	Project proponents
Value of monitored parameter for the monitoring period	Not applied for calculations. Swine farmers controlled the final destination of the compost (control of sales, consumer records, distance, etc) using a spreadsheet developed by Sustainable Carbon. Rina checked the values using the internal control of the farmer's site /12/. Data is not directly applied in the VERs calculation /3//.
Monitoring equipment	Not applicable.
Accuracy of the monitoring equipment	Not applicable.
Measuring/Reading/Recording frequency	Annually, based on monthly records
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PDD?	Calibration is not applicable.
Does the calibration cover the monitoring period? Has the calibration frequency been respected?	Calibration is not applicable.

Calibration certificates	Calibration is not applicable.

The data presented in the monitoring report /01/ were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by RINA for the reported emission reductions as listed in the above Section 3.

4.4 Non-Permanence Risk Analysis

Not applicable as it is a non-AFOLU project.

5 VERIFICATION CONCLUSION

RINA Service S.p.A (RINA) has performed verification of the emission reductions reported for the project activity "Composting Project in Santa Catarina" in Brazil, VCS Registration Reference N° 1144, monitoring period from 01/01/2013 to 30/06/2015, with regard to the relevant requirements for VCS and CDM rules.

The project participants of the project "Composting Project in Santa Catarina" are responsible for:

- The preparation of greenhouses gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the registered VCS Registration Reference ID - 1144, for the VCS monitoring period from 01/01/2013 to 30/06/2015.
- The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project.

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the VCS requirements and procedures and on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- The project has been implemented and operated as per the registered VCS PD;
- The monitoring plan in the registered VCS-PD is as per the applied baseline and monitoring methodology.
- The monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS and CDM requirements

It is RINA's opinion that the GHG emission reduction stated in the VCS monitoring report version 2 of 26/11/2015 for the Composting Project in Santa Catarina in Brazil, VCS Registration Reference N° 1144, for the period 01/01/2013 to 30/ 06/2015 are fairly stated. The GHG emission reductions were calculated correctly on the basis of the baseline and monitoring methodology, AMS-III.F. Avoidance of methane emissions through composting, version 10 of 18/02/2011 and AMS-III.D. Methane recovery in animal manure management systems, version 18 of 29/09/2011.

Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/01/2013 to 30/06/2015 amount to 28,564 tCO2e.
Reporting period: From 01/01/2013 to 30/06/2015

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2013 (01/Jan/2013 to 31/Dec/2013)	12,954	3,811	0	9,143
Year 2014 (01/Jan/2014 to 31/Dec/2014)	15,492	4,080	0	11,412
Year 2015 (01/Jan/2015 to 30/June/2015)	11,274	3,265	0	8,009

APPENDIX A

VERIFICATION PROTOCOL

TABLE 1 REQUIREMENTS CHECK LIST

Checklist Question		Reference	MoV[6]	Comments	Conclusion
A	**Monitoring Report**				
A.1	Does the used project title clearly enable the reader to identify the unique VCS activity? Is there an indication of a revision number, the date of the revision and the monitoring period?	/1/ /2/	/DR/ /CC/	Yes, the title of the project activity is "Composting Project in Santa Catarina" in the Monitoring Report version 1.0 of 21/08/2015, which enables the reader to identify the unique VCS activity. The title is also in line with the validated VCS PD and Validation Report. The monitoring period for the project activity is 01/01/2013 to 30/06/2015.	**OK**
A.2	Does the project comply with the applicable requirements for completing the Monitoring Reports (latest version available)?	/1/ /2/ /5/ /7/ /8/	/DR/ /CC/	Yes, the project complies with the applicable requirements for completing the Monitoring Report Template (v 3.3), VCS version 3, dated 08/10/2013.	**OK**
A.3	Does the MR comply with the template available (latest version)?	/1/ /2/ /5/ /7/ /8/	/DR/ /CC/	Yes, the project complies with the applicable requirements for completing the Monitoring Report Template (v 3.3), VCS version 3, dated 08/10/2013.	**OK**

[6] MoV: DR document review, I interview, CC cross checking

Checklist Question		Reference	MoV[6]	Comments	Conclusion
B	**Description of Project Activity**				
A.1	Title of the project activity, revision number and date of Monitoring Report	/1/ /2/	/DR/,/CC/	The title of the project activity is "Composting Project in Santa Catarina" in the Monitoring Report version 1.0 of 21/08/2015 and the same is found to be in line with the registered VCS PD.	**OK**
A.2	Is the actual implementation and operation of the proposed project activity in accordance with the project activity in the registered VCS-PD?	/1/ /2/	DR/I/CC Site visit	Rina performed an onsite visit on 01-03/09/2015 to verify the real implementation of the project against the description in the registered VCS PD. Rina confirmed the use of the mechanized composting unit at the Farms, as described in the VCS-PD. However, during the site visit, it was possible to verify that the following farm still maintain anaerobic lagoons to treat manure: - *Fazenda Gilmar*. Monitoring Authority of Gilmar José Sinigaglia Moreover, the following farms presented reforms during the monitoring period in the mechanized composting unit, and used the anaerobic lagoons to treat part of the manure: for a short period - *Fazenda Baccin* - *Fazenda Tomazz*i Verified during the onsite visit that some farms	**OK** ~~**CAR 1**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				have the operation license expired. PP is requested to clarify the renewal status of the operation licenses.	**OK** ~~**CR1**~~
A.3	Methodology applied for the registered project activity	/1/ /2/ /6/	DR/CC	Project activity applies the methodologies: • AMS-III.F. - "Avoidance of methane emissions through composting", version 10, valid from 04-March-2011 to 24-May-2012 • AMS-III.D. – "Methane recovery in animal manure management systems", version 18, valid from 13-October-2011 to 06-December-2012	**OK**
B	**Monitoring**				
B.1	**Monitoring plan**				
B.1	Is the actual implementation and operation of the proposed project activity in accordance with the project activity in the registered VCS-PD?	/1/ /2/	DR/I/CC	Please refer to Checklist Questions A.2	**OK** ~~**CAR 1**~~
B.2	In case of deviation between the registered project and the actual implementation/operation, do they comply with the requirements of the Project Standards?	/1/ /2/	DR/I/CC	Please refer to Checklist Questions A.2	**OK** ~~**CAR 1**~~
B.3	For project activity that consist of more	/1/ /2/	DR/I/CC	The project has been operational on all farms since the start date described above, except for *Fazenda*	**OK**

Checklist Question		Reference	MoV[6]	Comments	Conclusion
	than one site: - describe the status of the implementation and starting date of operation of each site;			*Sítio Pickler* and *Fazenda Pissaia.* These farms were not included in the current monitoring report following a personal decision from farm owners. The current operational status of the project in these farms is unknown. Please refer to Checklist Question A.2.	~~**CAR 1**~~
B.4	Methodology and methodological tool applied for the registered project activity	/1/ /2/ /17/	DR/I/CC	The approved methodologies were applied for the registered project activity as per the registered PD: - AMS-III.F. – "Avoidance of methane emissions through composting", version 10. - AMS-III.D. – "Methane recovery in animal manure management systems", version 18 - Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 01, valid from 16-May-2008 onwards /17/	**OK**
C Compliance of the monitoring activities with the registered monitoring plan / Compliance of the monitoring plan with the monitoring methodology and methodological tool					
C.1 Monitoring plan					
C.1.1	Does the monitoring plan included in the registered VCS project activity comply with the applied methodology?	/1/ /2/	DR/CC	Yes. The monitoring plan included in the registered VCS-PD complies with the applied methodologies as the plan includes all the monitoring parameters	**OK**

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				as required by the methodology applied.	
C.1.2	Does the monitoring comply with the monitoring plan in the registered VCS-PD?	/1/,/2/,	DR/CC	Yes. The monitoring complies with monitoring plan included in the registered VCS-PD.	**OK**
C.2	**Data and parameters fixed ex-ante or at renewal crediting period**				
C.2.1	Which parameters were available at validation and how were they verified?	/1/ /2/ /06/ /14/ /15/	DR/CC/I	In section 3, item 'Purpose of the data' is not being properly filled as recommendations of the MR template: *Indicate which of the data/parameter are used for baseline, project or leakage emission calculations.* The parameters available at the time of validation are as follows: Annual average temperature: Annual average temperature at project site. Default value: 18ºC. Source of data: National Institute of Meteorology (Instituto Nacional de Meteorologia – INMET). GWP $_{CH4}$: Global Warming Potential of CH $_4$. The value applied for the GWP $_{CH4}$: Global Warming Potential of CH_4. Is not in accordance with the EB decisions (EB 69 Annex 3). DCH_4: Density of CH_4. Default Value: 0.00067 at room temperature (20ºC) and 1 atm pressure. Source of data: Methodology AMS-III.D., version	**OK** ~~**CAR 2**~~ ~~**CAR 3**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				18. Information available on Page 3. /6/ UF_b: Correction factor to account for model uncertainties. Default Value: 0.94. Source of data: Methodology AMS-III.D., version 18. Information available on Page 3. /06/ MCF_j: Annual methane conversion factor for the baseline animal manure management system j. Default value: Uncovered anaerobic lagoons: 77%. Source of data: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.17. /15/ $B_{0,LT}$: Maximum methane producing potential of the volatile solid generated for animal type LT. Default Value: Market swine - 0.29 - Latin America; Breeding swine - 0.45 - Western Europe. Source of data: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.A-7 and 10A-8. /15/ $MS\%_{BL}$, Fraction of manure handled in baseline animal manure management system j. Default value: 100%. Source of data: Project Proponent, in accordance with the registered PD /01/. $W_{default}$: Default average animal weight of a defined population. Default Value: Market swine – 28 - Latin America; Breeding swine - 198 - Western Europe. Source of data: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4,	

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				chapter 10, table 10.A-7 and 10A-8. /15/ VS $_{default}$: Default value for the volatile solid excretion rate per day on a dry matter basis for a defined livestock population. Default value: Market swine - 0.3 - Latin America; Breeding swine - 0.46 - Western Europe. Source of data: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10, table 10.A-7 and 10A-8./15/ EF $_{composting}$: Emission factor for composting of manure. Default value: 4. gCH_4 / kg. Source of data: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 4.1, chapter 4, Volume 5 /15/ $TDL_{j,y}$: Average technical transmission and distribution losses for providing electricity to source j in year y. Default Value: 10%. Source data: Approved methodology AMS-III.F, version 10. /06/ MD: Manure density. Default Value: 1,016. Sorce of data: OLIVEIRA, Paulo Armando V. de. Produção e manejo de dejetos de suínos. Concórdia: Embrapa, 2003. 83 p. /14/	
C.2.2	What default data were selected and applied?	/1/ /2/	DR/CC/I	Please refer sector C.2.1 above.	**OK**
C.3	**Data and parameters monitored ex-post**				

Checklist Question		Reference	MoV[6]	Comments	Conclusion
C.3.1	Which parameter have been monitored during the monitoring period? (Data/Parameter monitored / Data unit / Description / Source of data to be used / Value data for the monitoring period)	/1/ /2/ /3/ /11/ /12/	DR/CC/I	The following are the parameters monitored during the monitoring period. **Data/Parameter**: $VS_{LT,y}$ **Data unit**: kg dm/animal/year **Description**: Volatile solids for livestock LT entering the animal manure management system in year y **Source of data**: - IPCC default value from: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, chapter 10, tables 10 A-7 and 10 A-8; - Wsite: Farmers, based on documents provided by integrators, State Agencies or other internal documents. **Values of monitored parameter**: MR version 1 /1/ does not present the values of $VS_{LT,y}$ from Fazenda Andretta, Fazenda Gilmar, for the entire monitoring period, and from Fazenda Ramela year 2013. **Crosscheck**: Rina crosschecked the values with the documents provided by integrators /11/ and the data in the VERs spreadsheet /03/, and verified the correct adequacy of the monitored	**OK** ~~**CAR 4**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				parameters reported. --- **Data/Parameter**: nd_y **Data unit**: Days **Description**: Number of days in year y in which the animal manure management system is operational. **Source of data**: Controlled by the project proponents **Values of monitored parameter:** MR version 1 does not present the values of nd_y from Fazenda Andretta, Fazenda Gilmar, for the entire monitoring period, and from Fazenda Ramela year 2013. **Crosscheck**: RINA crosschecked third party documents from integrators /11/ against the spreadsheet to calculate the VERs /03/, and verified the correct adequacy of the monitored parameters reported. --- **Data/Parameter**: W_{site}	~~**CAR 4**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				Data unit: Kg **Description**: Average animal weight of a defined livestock population at the project site **Source of data**: Controlled by the project proponents **Values of monitored parameter**: MR version 1 does not present the values of W_{site} from Fazenda Andretta, Fazenda Gilmar for the entire monitoring period and for Fazenda Ramela year 2013 **Crosscheck**: RINA crosschecked third part documents from integrators /11/ against the spreadsheet to calculate the VERs /03/, and verified the correct adequacy of the monitored parameters reported. --- **Data/Parameter**: N_{day} **Data unit:** Days **Description**: Number of days animal is alive in the farm in the year y **Source of data**: controlled by project proponent.	~~CAR 4~~ ~~CAR 4~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				Values of monitored parameter: MR version 1 does not present the values of N_{day} from Fazenda Andretta, Fazenda Gilmar for the entire monitoring period, and from Fazenda Ramela year 2013. **Crosscheck**: RINA crosschecked third part documents /11/ against the spreadsheet to calculate the VERs /03/, and verified the correct adequacy of the monitored parameters reported. --- **Data/Parameter**: $N_{p,y}$ **Data unit**: Number of animals **Description**: Number of animals produced annually of type LT for the year y **Source of data**: controlled by project proponents **Values of monitored parameter**: MR version 1 does not present the values of $N_{p,y}$ from Fazenda Andretta, Fazenda Gilmar for the entire monitoring period, and from Fazenda Ramela year 2013. **Crosscheck**: RINA crosschecked the third part documents from integrators /11/ and the spreadsheet to calculate the VERs /03/, and	~~**CAR 4**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				verified the correct adequacy of the monitored parameters reported. --- **Data/Parameter: $N_{LT,y}$** **Data unit**: Number of animals **Description**: Annual average number of animals of type LT in year y **Source of data**: controlled by project proponents **Values of monitored parameter** MR version 1 does not present the values of **$N_{LT,y}$** from Fazenda Andretta, Fazenda Gilmar for the entire monitoring period,, and from Fazenda Ramela year 2013. **Crosscheck**: RINA crosschecked third party information from integrators /11/ against the spreadsheet to calculate the VERs /03/, and verified the correct adequacy of the monitored parameters reported. --- **Data/Parameter: $Q_{y,treatment}$** **Data unit**: Tonnes	~~CAR 4~~ ~~CAR 4~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				Description: Quantity of compost produced in year y **Source of data**: controlled by project proponents **Values of monitored parameter**: MR version 1 does not present the values of $Q_{y,treatment}$ from any farm site for the entire monitoring period. **Crosscheck**: No information was available to crosscheck. --- **Data/Parameter: EC $_{PJ,j,y}$** **Data unit:** MWh **Description**: Quantity of electricity consumed by the project electricity consumption source j in year y **Source of data**: controlled by project proponents. In accordance with the monitoring report /1/ section 2.2.1 Methodology Deviations, PP used a deviation in the monitoring of the quantity of electricity consumed by the project, which is related to emissions from electricity consumption. AMS-III.F version 10 /6/ determines it shall be assumed that all relevant electrical equipment	

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				operate at a full rate capacity, plus 10% to account for distribution losses, for 8,760 hours per year in case electricity consumption is not directly monitored. However, given the farms management processes and their low energy consumption, a conservative value was applied. Such value is based on monitored data collected in part of this monitoring period and on LPC judgment about the expected time of operation of the manure pump and the UMAC equipment, which are the two only equipment demanding electricity consumption in the AWMS. Values applied on the emission reduction calculation were conservatively defined as the highest value from either: - LPC judgment corrected with the use of a conservative factor of 125%, meaning an operation time 25% higher than expected by LPC; or - The average operation time of each equipment as monitored by each farmer during part of the monitored period. Rina accepted the deviation since it would not negatively affect the conservativeness of the quantification of GHG emission reductions or removals, since PP applied conservative	~~CAR 4~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				estimated values in case monitoring data was incomplete. Furthermore, during the site visit RINA verified that the PP applied conservative values in comparison with the values described from the farms owners during interviews. **Values of monitored parameter**: MR version 1 does not present the values of **EC $_{PJ,j,y}$** from Fazenda Andretta, Fazenda Gilmar,for the entire monitoring period, and from Fazenda Ramela year 2013. **Crosscheck**: RINA crosschecked third part information from LPC /18/ against the farmers internal control /12/ and interviews during site visit, in order to ensure that the most conservatively value was used in the spreadsheet to calculate the VERs /03/. --- **Data/Parameter: EF $_{EL,j,y}$** **Data unit**: tCO_2/MWh **Description**: Emission factor for electricity generation for source j in year y (tCO_2/MWh) **Source of data**: Brazilian Designated National Authority (DNA) /13/	

Checklist Question	Reference	MoV[6]	Comments	Conclusion
			Values of monitored parameter: Year | $EF_{EL,j,y}$ (tCO_2/MWh) /13/ 2013 | 0.4322 2014 | 0.4400 2015 | 0.4400 **Crosscheck**: RINA crosschecked the values against data obtained directly from the Brazilian DNA website./13/. Most recent data available is from 2014; therefore, it was also applied for the year 2015. No error was found. --- **Data/Parameter:** Q_y **Data unit:** Tonnes (wet basis) **Description**: Quantity of manure treated in the year y **Source of data**: controlled by project proponents. The amount of waste produced per year was monitored by registering the operating hours of the pump that destine the manure from the storage tank to the composting unit. However, since monitoring data is incomplete for the current monitoring period, this parameter was	~~CR 3~~ ~~CAR 4~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				conservatively defined as the highest - LPC judgment. - The average quantity of manure treated per day monitored by each farmer during part of the monitored period. The most conservative value was then multiplied by the number of days where animal manure management system is operational (ndy), achieving the quantity of manure treated per year (Qy). **Values of monitored parameter**: MR version 1 does not present the values of Q_y from Fazenda Andretta, Fazenda Gilmar for the entire monitoring period,, and from Fazenda Ramela year 2013.. **Furthermore,** Please provide evidences for Q_y. According to VCS PD /02/ the Q_y shall be calculated. The formulae for calculations were not provided in the calculation spreadsheet /19/. **Crosscheck**: RINA crosschecked third part information from LPC /18/ against the farmers internal control /12/, in order to ensure that the most conservatively value was used in the spreadsheet to calculate the VERs /03/.	~~**CAR 5**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				--- **Data/Parameter:** Conditions of the composting process **Data unit:** ºC for temperature; moisture level (qualitative analysis), ranging from very humid to very dry; Frequency of time for operation of the mixing equipment. **Description**: Conditions of the composting process include monitoring the following parameters: temperature and moisture of the composting mass and frequency of operation of the mixing equipment (UMAC). **Source of data**: controlled by project proponents **Values of monitored parameter**: MR version 1 does not present the values for the parameter Conditions of the composting process in Appendix 3. **Crosscheck**: Rina checked the values using the internal control of the farmer's site /12/. However, no crosscheck was possible since the data was ot used in MR version 1 /1/. --- **Data/Parameter:** Soil application of the compost for agricultural purposes	~~**CAR 6**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				Data unit: Numerical frequency. **Description:** Number of times that the compost is removed from the treatment system, providing a description of the soil application. **Source of data**: controlled by project proponents **Values of monitored parameter**:.MR version 1 does not present the values for the parameter 'Soil application of the compost for agricultural purposes' in Appendix 3. **Crosscheck**: Rina checked the values using the internal control of the farmer's site /12/. However, no crosscheck was possible since the data was not used in MR version 1 /1/.	
C.3.2	Is the measurement equipment described? Is the accuracy of the measurement equipment addressed and deemed appropriate?	/1/,/2/, /3/, /11/ /12/	DR/CC/I	The measurements equipment for the project described as • Storage bags with predefined weight or volume • Thermometers and moisture meters. The accuracy of the measurement equipment addressed was deemed appropriate during the validation	**OK**
C.3.3	Is the measuring/reading/recording frequency adequate for all monitoring	/1/ /2/ /3/	DR/CC/I	The measuring/reading/recording frequency were	**OK**

Checklist Question		Reference	MoV[6]	Comments	Conclusion
	parameters? Is it in line with the registered monitoring plan?			not presented for the parameter: - Conditions of the composting process - Q $tr_{eatment}$	~~**CAR 7**~~
C.4	**Calibration requirements**				
C.4.1	Are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate?	/1/ /2/	DR/ CC	Calibration is not applicable.	**OK**
C.4.2	Does the calibration cover the monitoring period?	/1/ /2/	DR/ CC	Calibration is not applicable.	**OK**
C.4.3	Has the calibration frequency been respected?	/1/ /2/	DR/ CC	Calibration is not applicable.	**OK**
C.4.4	In case of delay, describe the applied maximum permissible error	/1/ /2/	DR/ CC	Calibration is not applicable.	**OK**
C.5	**Monitoring of the sustainable indicators**				
C.5.1	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host Country?	/1/ /2/	DR/CC	PP is applying the Social Carbon Standard. The monitoring of the indicator is being verified in parallel to the verification, presented in a separate report.	**OK**

Checklist Question		Reference	MoV[6]	Comments	Conclusion
C.6	**Management system and quality control**				
C.6.1	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/ /2/ /3/ /11/ /12/	DR/ I/CC	During the onsite visit, Rina verified that the project proponents have not registered for a period of time the following parameters: - ECP,j,y - Qy - Conditions of the composting process As a result, the PP included deviations in the MR /1/ section 2.2.1 Methodology Deviations for these parameters. PP used conservative values for these parameters. The conservative values were determined using a declaration from a third party company that is responsible for the technology of the mechanized compost unit. The deviations described in the VCS MR /1/ will not affect the conservativeness of the quantification of GHG emission reductions or removals. Rina accepted the deviations. However, Project participants shall present procedures to assure the correct monitoring of these parameters for the next monitoring period	**OK** ~~**FAR 1**~~
C.6.2	Are procedures identified for day-to-day record handling (including what records to keep, storage area of records and how to process performance documentation)? Will all monitored data required for	/1/ /2/ /03/ /11/ /12/	DR/I/CC	Yes, monitored data from the project proponents are used to input data in the VERs spreadsheet /03/. During the on site visit RINA has crosschecked the original documents /11/ /12/ against the spreadsheet /3/ to confirm the correct	**OK**

Checklist Question		Reference	MoV[6]	Comments	Conclusion
	verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?			data transference. The MR describes that data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later	
C.6.3	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/ /2/ /3/	DR/I /CC	Please refer to CAR 4 and FAR 1.	**OK** ~~**CAR 4**~~ ~~**FAR 1**~~
C.6.4	Are the responsabilities and authorities for monitoring and reporting in accordance with the responsabilities and authorities stated in the monitoring plan?	/1/ /2/ /03/ /11/ /14/	DR/I /CC	Yes. During the site visit, it was possible to interview the personnel, and it was possible to determine that the responsabilities and authorities for monitoring and reporting in accordance with the responsabilities and authorities stated in the monitoring plan. Rina request PP to provide the training records on data recording and emergency procedures, and training records provided to the farmers. The project proponents are responsible for the monitoring of the parameters. There are data /11/ and internal document control for each project proponent /12/. These are the basis of the VERs calculations spreadsheet /3/.	**OK** ~~**CAR 10**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
C.6.5	Does data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	/01/ /02/ /03/	DR/I /CC	Yes, data to crosscheck the monitored parameters are available at the each project site and available at LPC office and Sustainable office.	**OK**
D.1	**Assessment of data and calculation of emission reductions/Accuracy of emision reduction calculations**				
D.1.1	How were the values in the monitoring report verified and cross-checked?	/01/ /02/ /03/	DR/I/ CC	Please refer to section C.3.1. In the MR version 1, Equation 10 is referred 2 times.	**OK** ~~**CAR 1**~~ ~~**CAR 4**~~ ~~**CAR 8**~~
D.1.2	If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	/01/ /02/ /03/	DR/I/ CC	VERs was based on monitored data, or in the most conservative assumption theoretically possible been applied. Moreover, a request for deviation have been approved in the Validation Report /09/ and verified in the last Verification Report/ 10//.	**OK**
D.1.3	Emission reductions reported	/01/ /02/ /03/	DR/I/ CC	Rina request additional information for the VERs calculation. Please, refer to the section C.3.1 PP calculated the emission reductions through individually spreadsheets for each project site /19/. Afterwards, PP summarized the emission	**OK** ~~**CAR 1**~~ ~~**CAR 3**~~

Checklist Question		Reference	MoV[6]	Comments	Conclusion
				reductions in the spreadsheet /3/. PP calculated baseline emission and the project emissions /19/ in accordance with the methodologies /06/. Rina crosschecked the values presented in the spreadsheets /19/ against data from third party documentation /11/ and internal control /12/. The value applied for the GWP $_{CH4}$: Global Warming Potential of CH_4. Is not in accordance with the EB decisions (EB 69 Annex 3). According to onsite visit and document review, PP have not included the last batch of swine production for the following Farms: - *Fazenda Zuffo* - *Fazenda Helen* - *Sítio Santa Luica* - *Fazenda Suruvy* - *Fazenda Ramella*	~~**CAR 4**~~ ~~**CAR 9**~~
D.1.4	Difference between the emission reductions estimated in the registered PD and the emission reductions reported for the monitoring period.	/01/ /02/ /03/	DR/I/ CC	PP is requested to clarify the difference between the emission reduction estimated in the registered PD and the emission reductions reported for the monitoring period.	**OK**

Checklist Question		Reference	MoV[6]	Comments	Conclusion
					~~CR 2~~

TABLE 2 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Verification Conclusion
~~**CAR 1**~~ During the site visit, it was possible to verify that the following farm still maintain anaerobic lagoons to treat manure: - Fazenda Gilmar. Monitoring Authority of Gilmar José Sinigaglia Moreover, the following farms presented reforms during the monitoring period in the mechanized composting unit, and used the anaerobic lagoons to treat part of the manure: for a short period - Fazenda Baccin - Fazenda Colônia Suspiro Please consider this information in the MR, emissions calculation, and project emissions.	A.2 D.1.1 D.1.3	The operation of anaerobic lagoons in Gilmar Farm, Helena Farm and Colônia Suspiro Farm was included in the MR and calculations. The detailed status at each farm during the monitoring period was described in Section 2.1 of the MR. The operation of anaerobic lagoons in these farms was measured by the parameter Fraction of manure handled in baseline animal manure management system j (MS%BL,j), which calculates baseline emissions by providing the fraction of manure that would be handled in the baseline treatment system (anaerobic lagoon). The calculation of this parameter was based on the period within the monitoring period that each farm operated anaerobic lagoons. This approach has been carried out in order to claim emission reductions only for the manure treated by the	According to evidence received from PP, a maintenance equipment purchase note /20/ Fazenda Baccin partially deactivated the composting unit was due to maintenance on 01/07/2015, which does not correspond to this monitoring period. Fazenda Colônia Suspiro partially deactivated the composting unit on 01/05/2015. The compost unit treated 25% of the manure during this maintenance period, while the rest (75%) was treated using anaerobic lagoon. Fazenda Gilmar never deactivated the anaerobic lagoon, which treats around 40% of the total manure generated in the farm. Fazenda Helena deactivated the composting unit due to maintenance on 01/07/2015, and all the manure was

		composting process during the monitoring period, as this parameter directly impacts the GHG emission reductions. This information was included in Section 3.1 of the MR, parameter MS%BL,j.	treated using anaerobic lagoon during this period. PP measured the operation of anaerobic lagoons in these farms by the parameter Fraction of manure handled in baseline animal manure management system j (MS%BL,j). The values of MS%BL,j for these farms were: Fazenda Colônia Suspiro: 0,84 for the year of 2015 CAR closed.
~~**CAR 2**~~ In section 3, item 'Purpose of the data' is not being properly' filled as recommendations of the MR template: *Indicate which of the data/parameter are used for baseline, project or leakage emission calculations.*	C.2.1	The item 'Purpose of the data' (Sections 3.1 and 3.2 of the MR) was corrected according to recommendations from VCS Standard, detailing the use of each data/parameter (baseline, project or leakage emission calculations).	The item 'Purpose of the data' were corrected accordingly. CAR Closed.
~~**CAR 3**~~ The value applied for the GWP_{CH4}: Global Warming Potential of CH_4 is not in accordance with the EB decisions (EB 69 Annex 3).	C.3.1 D.1.1 D.1.3	According to decisions from EB 69 Annex 3, the new GWP of methane based on a 100-year time horizon is 25, following the last report from Intergovernmental Panel on Climate Change - IPCC (2014). Therefore, this parameter was updated in Section 3.1 of the MR. In addition, all GHG calculations were updated accordingly.	The value applied for the GWP_{CH4}: Global Warming Potential of CH_4 was corrected accordingly. Further, the calculations were also corrected. CAR Closed.

~~**CAR 4**~~ MR version 1 /1/ does not present the values of following parameters from *Fazenda Andretta, Fazenda Gilmar* for the entire monitoring period, and from *Fazenda Ramela* year of 2013 - $VS_{LT,y}$. - $nd_{,y}$ - W site - $Nda_{,y}$ - $Np_{,y}$ - $NLT_{,y}$ - $Qy_{,treatment}$ - $ECP_{,j,y}$ - Qy	C.3.1 D.1.1 D.1.3	The values of all monitored parameters from Fazenda Andretta, Fazenda Gilmar and Fazenda Ramella were included in the MR.	The values of all monitored parameters were included accordingly. CAR Closed.
~~**CAR 5**~~ MR version 1 does not present the values for the parameter 'Conditions of the composting process' in Appendix 3.	C.3.1	All evidences for the parameter 'Conditions of the composting process' at each farm will be sent to the verification team. The Appendix 3 contains the template that was used for monitoring the temperature and moisture of the composting mass in the composting windrows	PP sent evidences for the parameter 'Conditions of the composting process' /21/ accordingly. CAR closed.
~~**CAR 6**~~ MR version 1 does not present the values for the parameter 'Soil application of the compost for agricultural purposes' in Appendix 3.	C.3.1	All evidences for the parameter 'Soil application of the compost for agricultural purposes' at each farm will be sent to the verification team. The Appendix 2 contains the template that was used for monitoring the final destination of the compost in each farm.	PP sent evidences for the parameter 'Soil application of the compost for agricultural purposes' /12/ accordingly. CAR Closed.

~~CAR 7~~ The measuring/reading/recording frequency were not presented for the parameter: - Conditions of the composting process - $Q_{y\ Treatment}$	C.3.3	The 'Conditions of the composting process' was monitored by checking: - Temperature and moisture of the composting mass. Average measuring frequency of around 15 days; - Operation of the composting equipment, recorded in a daily frequency. The parameter '$Q_{y,treatment}$' was monitored in an annual frequency, based on monthly records.	The measuring/reading/recording frequency were presented for the parameters accordingly. CAR closed.
~~CAR 8~~ In the MR version 1, Equation 10 is referred 2 times.	D.1.1	The references to Equations 10 and 11 were corrected.	PP corrected the equations accordingly. CAR closed.
~~CAR 9~~ According to onsite visit and document review, PP have not included the last batch of swine production for the following Farms: - *Fazenda Zuffo* - *Fazenda Helen* - *Sítio Santa Luica* - *Fazenda Suruvy* - *Fazenda Ramella*	D.1.3	The last batch of swine production for the Farms: Zuffo, Helena, Suruvy, Ramella, and Sítio Santa Lúcia were included in the MR and calculations.	PP included the last batch of wine production accordingly. CAR Closed.

~~**CR 1**~~ Verified during the onsite visit that some farms have the operation license expired. PP is requested to clarify the renewal status of the operation licenses.	A.2	All operational licenses have been renewed. These documents will be made available for the verification team.	PP sent the renewed Operational Licenses /16/ for the farms accordingly. CR closed.
~~**CR 2**~~ PP is requested to clarify the difference between the emission reduction estimated in the registered PD and the emission reductions reported for the monitoring period.	D.1.4	The emission reductions achieved during the current monitoring period were around 85% from those estimated in the VCS PD. The main reasons of this difference were: · Two farm owners (Sítio Pickler and Pissaia Farm) decided to not participate of the current monitoring report; and Three farms operated anaerobic lagoons during the current monitoring period (Gilmar Farm, Helena Farm and Colônia Suspiro Farm).	RINA accepted the clarification accordingly. CR closed.
~~**CR 3**~~ Please provide evidences for Q_y. According to VCS PD /02/ the Q_y shall be calculated. The formulae for calculations were not provided in the calculation spreadsheet /19/.	C.3.1	The Q_y calculation was corrected in the MR and calculation spreadsheet. Q_y values applied on the emission reduction calculation were conservatively defined as the highest value of: · Embrapa scientific study*. · The average quantity of manure treated per day monitored by each farmer during part of the monitored period. This value was	PP corrected the Qy calculations and sent the evidences /21/ accordingly. CR closed.

		achieved through the operating hours of the pump that destine the manure from the storage tank to the composting unit, which has a specific nominal flow. The most conservative value was then multiplied by the number of days where animal manure management system is operational (nd_y), achieving the quantity of manure treated per year (Q_y). * Embrapa scientific study was utilized to obtain default values on the average production of swine manure, which are established according to the swine type and weight. In case these values were used, they were multiplied by the annual average number of animals of each type and by the number of days in year y where the animal manure management system was operational, thus obtaining the quantity of manure treated in the year y.	
~~CR 4~~ Rina request PP to provide the training records on data recording and emergency procedures, and training records provided to the farmers.	C.6.4	The training records were sent to DOE.	PP sent the training records /22/ accordingly. CR closed.

TABLE 3 FORWARD ACTION REQUEST

Forward action request	Reference to Table 2	Response by project participants Verification Conclusion
FAR 1 During the onsite visit, Rina verified that the project proponents have not registered for a period of time the following parameters: - ECP,j,y - Qy - Conditions of the composting process As a result, it was used conservative values for these parameters. The conservative values were determined using a declaration from a third part company that is responsible for the technology of the mechanized compost unit. Project participants shall present procedures to assure the correct monitoring of these parameters for the next monitoring period	C.6.1	Procedures to assure the correct monitoring of the parameters $EC_{PJ,j,y}$, Q_y, and 'Conditions of the composting process' will be presented for the next monitoring period. RINA: Since the PP has committed itself to resolve the issue in the next verification, we have accepted the same and however the same to be verified during next verification

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Thais De Lima Carvalho**
è qualificato come[1]: *is qualified as:*	**CDM -TEC, -VAL, -VER, -TL**
per le seguenti aree tecniche: for the following technical areas:	**1.1, 1.2, 2.1, 13.1**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
1.1	Thermal energy generation	1
1.2	Renewables	1
2.1	Electricity distribution	2
13.1	Solid waste and wastewater	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	19-08-2009	-
12	15-01-2015	Added TA 2.1

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rafael Krupper**
è qualificato come[1]: *is qualified as:*	**CDM/GS/VCS/SCS -TEC, -VAL, -VER, -TL**
per le seguenti aree tecniche: for the following technical areas:	**1.1, 1.2**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
1.1	Thermal energy generation	1
1.2	Renewables	1

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	30/03/2015	First issue

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rekha Menon**
è qualificato come[1]: *is qualified as:*	**CDM–TEC, –VAL, -VER, -TL**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 2.1, 13.1, 13.2, 14.1**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
1.2	Renewables	1
2.1	Energy Demand	2
13.1	Solid Waste and wastewater	13
13.2	Manure	13
14.1	Afforestation and reforestation	14

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	06-03-2008	-
10	22-12-2014	Update qualification according to AS ver.6.0

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rita Valoroso**
è qualificato come1: *is qualified as:*	**CDM -TEC, -VAL, -VER, -TL** **TECHNICAL REVIEWER**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 13.1**

AREE TECNICHE **TECHNICAL AREAS**	**DESCRIZIONE DELL'AREA TECNICA** ***TECHNICAL AREA DESCRIPTION***	**SCOPO SETTORIALE** ***SECTORAL SCOPE***
1.2	Renewables	1
13.1	Solid Waste and waste water	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	18-01-10	-
9	22-12-2014	Update qualification according to AS ver.6.0

Il Resp. QPT
Head of QPT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	