



**UNFCCC
Clean Development Mechanism
Monitoring Report**

**AWMS GHG Mitigation Project
BR05-B-05, Minas Gerais and Sao Paulo,
Brazil**

Monitoring Period: 01 April 2009 – 31 October 2009

CDM Registration number: UNFCCC0412

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Date: 01 December 2009

**CLEAN DEVELOPMENT MECHANISM
PROJECT ACTIVITY MONITORING REPORT**

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- A. General description of project activity
- B. Monitoring of a CDM project activity
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Section A General Project Activity Information**A.1 Title of the project activity:**

AWMS GHG Mitigation Project, BR05-B-05, Minas Gerais and Sao Paulo, Brazil

A.2 Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	AgCert Do Brasil Solucoes Ambientais Ltda.	No
United Kingdom of Great Britain and Northern Ireland	AgCert International Ltd.	No
Switzerland	AgCert International Ltd.	No

A.3 Crediting period:**A.3.1 Crediting period:**

The crediting period for this project activity is from 1 May 2005 through 30 April 2015.

A.3.2 Total estimated emission reductions over the crediting period:

The total estimated emissions reduction over the 10 year project period as documented in the PDD is 754,582 Tonnes of CO₂ equivalent.

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A.4 Project activity description and background:

Construction of all sites was completed and monitoring commenced as indicated in Table A1.

Site			Monitoring Start Date	Renewable Energy Equipment
Legal Entity	ID	Name		
Manoel Naves Cardoso e outros	10602	Fazenda Santa Maria	31-Jan-06	
João Demétrio Jorge	10603	Fazenda Cachoeirinha	29-Jul-05	
José Gouveia Franco Neto	10604	Fazenda São Vicente	28-Jul-05	
Hélcio Pereira de Queiroz	10610	Fazenda São Francisco	16-Jun-05	
Hamilton Vieira Engel	10611	Fazenda Nova Era	30-Sep-06	
Flávio José de Abreu David	10626	Granja Pôr do Sol - Finishers	07-Dec-05	
	850191	Granja Pôr do Sol - Sows	07-Dec-05	
Hélio José Martins	10687	Suinocultura Martins - Sows	07-Dec-05	
	850201	Suinocultura Martins - Finishers	07-Dec-05	
Alvaro da Silva Cunha	10692	Fazenda Santo Ignacio de Loyola	15-Oct-05	
	26262	Fazenda Santo Ignacio de Loyola Sítio 2	15-Oct-05	
Assad Antônio Daher	10693	Fazenda Barra Preta	21-Dec-05	
Izilda Aparecida Fernandes Cintra	10699	Sítio Califórnia	09-Mar-06	
Odelma A. Pereira de Oliveira	10720	Fazenda Quintinos	N/A	
Rui Alberto Lopes Simões	10721	Fazenda Rio das Pedras	01-Feb-06	
Domício Ricardo Borges de Moraes	10722	Fazenda Santa Inês	08-Jul-05	X
Elci Pereira de Rezende	10724	Fazenda Bomsucesso	21-Aug-06	
Sociedade de Estímulos Agropecuários Ltda	10731	Fazenda Dona Olivia	26-Aug-05	
José Ricardo Bretas Leite	10655	Sítio Nosso Senhor do Bomfim	18-Aug-05	
Manuel Magin Iglesias Silva	27192	Fazenda Nossa Senhora da Conceição	19-Jan-06	

Table A.1. Monitoring Start Dates for Individual Sites

Section B Monitoring of a CDM project activity

B.1 Monitoring report:

B.1.1 Monitoring reports associated with this project activity:

Table B.1 lists all monitoring reports associated with this project activity.

Report Number	Dates		Resulting emission reductions	Verifying DOE
	From	To		
MR05-BR05-B-05 (current report)	1 Apr 2009	31 Oct 2009	See B.1.2	DNV
MR04-BR05-B-05	1 Aug 2008	31 Mar 2009	22,150	DNV
MR03BR05-B-05	1 Oct 2007	31 Jul 2008	25,028	DNV
MR02-BR05-B-05	1 Nov 2006	30 Sep 2007	29,645	DNV
MR01-BR05-B-05	1 May 2005	31 Oct 2006	25,877	DNV

Table B.1. Monitoring reports submitted for project activity

B.1.2 Emission reductions achieved over the monitored period:

THE EMISSIONS REDUCTION ACHIEVED OVER THE DESIGNATED MONITORING PERIOD IS 18,364 TONNES OF CO₂ EQUIVALENT

B.2 Methodologies applied:

This project activity utilized the CDM approved baseline methodology AM0016, Version 02: *Greenhouse gas mitigation from improved Animal Waste Management Systems in confined animal feeding operations*.

B.3 Monitoring plan:

The monitoring plan “AWMS GHG Mitigation Project, Operations & Maintenance Plan” was developed based on the approved monitoring methodology identified in paragraph B.2. Monitoring is carried out in accordance with the revision to the monitoring plan approved on 20 August 2007.

B.4 Parameters, emission factors and references for calculations:

Values for all parameters, emission factors, and their associated references are available below and in the PDD associated with this project.

Parameter/Factor	Value	Source/Comment
Baseline		
CH ₄ GWP	21	Intergovernmental Panel on Climate Change, <i>Climate Change 1995: The Science of Climate Change</i> (Cambridge, UK: Cambridge University Press, 1996)
ID1	Annex 3	Animal population used to estimate baseline and project emission estimates was based on a 12 month period of actual operation production data (See Annex 3).
ID1	Annex 3	Mortality rate
ID1 (n _m)	Annex 3	Days resident in system
ID14	100%	AWMS operation status
MS% _j	100%	Percent of effluent used in system.
V _s	0.5	Obtained from 1996 IPCC, Appendix B, Table B-6, p. 4.46
B _o	0.45	Obtained from 1996 IPCC, Appendix B, Table B-6, p. 4.46
MCF _{month}	0.90	Obtained from 1996 IPCC, Appendix B, Table B-6, p. 4.46
N ₂ O GWP	310	Intergovernmental Panel on Climate Change, <i>Climate Change 1995: The Science of Climate Change</i> (Cambridge, UK: Cambridge University Press, 1996)
C _m	1.5714	Conversion factor from [N ₂ O – N] to N ₂ O (C _m =44/23)
F _{gasm}	0.2	Obtained from 1996 IPCC, Table 4-19, p. 4.94

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Parameter/Factor	Value	Source/Comment
EF ₃	0.001	Obtained from IPCC 2000 Table 4.12, Section 4.4.1.2, p. 4.43
EF ₄	0.01	Obtained from IPCC 2000 Table 4.18 Section 4.8.1.2, p. 4.73
N _{ex}	20	Obtained from 1996 IPCC, Table 4-20, p. 4.99
Project Activity		
CH ₄ GWP	21	Intergovernmental Panel on Climate Change, <i>Climate Change 1995: The Science of Climate Change</i> (Cambridge, UK: Cambridge University Press, 1996)
ID1	Annex 3	Animal population used to estimate baseline and project emission estimates was based on a 12 month period of actual operation production data (See Annex 3).
ID1	Annex 3	Mortality rate
ID1 (n _m)	Annex 3	Days resident in system
ID14	100%	AWMS operation status
MS% _j	100%	Percent of effluent used in system
V _s	0.5	Obtained from 1996 IPCC Appendix B, Table B-6, p. 4.46
ID1		Days resident in farm
B _o	0.45	Obtained from 1996 IPCC, Appendix B, Table B6, p. 4.46
MCF _{month}	0.10	Obtained from 1996 IPCC Appendix B, Table B-6, p. 4.46
N ₂ O GWP	310	Intergovernmental Panel on Climate Change, <i>Climate Change 1995: The Science of Climate Change</i> (Cambridge, UK: Cambridge University Press, 1996)
C _m	1.5714	Conversion factor from [N ₂ O – N] to N ₂ O (C _m =44/23)
F _{gas}	0.2	Obtained from 1996 IPCC, Table 4-19, p. 4.94
EF ₃	0.001	Obtained from IPCC 2000 Table 4.12, Section 4.4.1.2, p. 4.43
EF ₄	0.01	Obtained from IPCC 2000 Table 4.18 Section 4.8.1.2, p. 4.73
N _{ex}	20	Obtained from 1996 IPCC, Table 4-20, p. 4.99
Leakage		
N _{ex}	20	Obtained from 1996 IPCC, Table 4-20, p. 4.99
ID1	Annex 3	Animal population used to estimate baseline and project emission estimates was based on a 12 month period of actual operation production data (See Annex 3).
ID1	Annex 3	Mortality rate
ID1 (n _m)	Annex 3	Days resident in system
F _{gas}	0.2	Obtained from IPCC 1996, Table 4-19, p. 4.94
EF ₁	0.0125	Obtained from IPCC 1996, Table 4-18, p. 4.39
C _m	1.5714	Conversion factor from [N ₂ O – N] to N ₂ O (C _m =44/23)
F _{leach}	0.3	Obtained from IPCC 1996, Table 4-24, p. 4.106
EF ₅	0.025	Obtained from IPCC 1996, Table 4-23, p. 4.105
EF ₄	0.01	Obtained from IPCC 2000 Table 4.18 Section 4.8.1.2, p. 4.73

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Parameter/Factor	Value	Source/Comment
ID16	500 kwh/yr	Electricity consumed by project activity equipment
ID19	90,000kwh/yr	Electricity generated by project activity equipment using captured methane
ECy	0.719kg CO ₂ / kwh	OECD: Road-Testing Baseline for GHG Projects in the Energy Power Sector. Emission coefficient for electricity (Consumed by Project Activity Equipment)
ECy	0.275kg CO ₂ / kwh	OECD: Road-Testing Baseline for GHG Projects in the Energy Power Sector. Emission coefficient for electricity (Produced by Project Activity Generator)

Animal Weights used for this project include:

Livestock type	Sow	Boar	Gilt	Finisher	Nurser
Standard animal class weight	181	204	181	56	13
Weight adjusted Vs	0.5	0.5	0.5	0.5	0.5

B.5 Monitored baseline data:

The baseline data collected in accordance with the registered PDD and approved monitoring methodology, AM0016, is provided in the following table:

Baseline Data									
Year	Month	ID1					ID 6	ID 9	
		Boar	Finisher	Gilt	Nurser	Sow	AWMS Type	Temp °C	Rain cm
2009	4	57	68,131	517	21,376	5,892	AL	21.7	1.3
2009	5	49	61,719	455	24,186	5,369	AL	20.0	4.7
2009	6	52	61,362	467	24,183	5,431	AL	19.1	1.2
2009	7	57	62,383	445	20,376	5,489	AL	19.1	2.0
2009	8	56	64,998	418	19,149	5,514	AL	20.2	5.9
2009	9	57	68,435	440	20,198	5,495	AL	21.9	8.6
2009	10	58	69,520	501	18,554	5,519	AL	22.2	24.4

Table B.2 Baseline data (ID6¹, ID9²)

¹ AL: Anaerobic Lagoon

² <http://www7.ncdc.noaa.gov/IPS/MCDWPubs?action=getpublication>

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B.6 Monitored project activity data:

The project activity data collected in accordance with the registered PDD and approved monitoring methodology, AM0016. The data shown in table B.3 is a summation or average of all sites included in the project. Individual site specific inventory data has been presented to the DOE for verification. Table B.4 provides the Weekly Operational Status of the sites per ID 14.

Project Activity Data											
Year	Month	ID1					ID 6	ID 9		ID 12	ID 13
		Boar	Finisher	Gilt	Nurser	Sow	AWMS Type	Temp	Rain	Biogas	CO ₂
								°C	cm	m ³	%
2008	8	52	61962	642	22813	5919	AD	20.3	1.3	305,019	36.3
2008	9	55	67880	702	21034	5776	AD	21.7	3.9	321,750	
2008	10	53	59107	699	25620	5770	AD	22.4	4.1	334,126	
2008	11	55	64427	651	23146	5811	AD	22.4	8.1	329,867	37.1
2008	12	55	62638	550	26404	5822	AD	22.2	19.9	308,889	
2009	1	53	68499	540	19894	5824	AD	22.6	10.3	321,185	
2009	2	55	62732	510	25903	5862	AD	23.0	2.1	298,466	36.8
2009	3	55	62863	545	21821	5817	AD	22.8	9.9	307,541	

Table B.3. Project activity data (ID6³, ID9⁴)

³ AD: Anaerobic Digester

⁴ <http://www7.ncdc.noaa.gov/IPS/MCDWPubs?action=getpublication>

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ID 14 Status										
Start date of week	Site ID									
	10602	10603	10604	10610	10611	10626	850191	10687	850201	10692
4/1/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
4/5/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
4/12/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
4/19/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
4/26/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
5/1/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
5/3/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
5/10/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
5/17/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
5/24/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
5/31/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
6/7/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
6/14/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
6/21/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
6/28/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
7/5/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
7/12/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
7/19/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
7/26/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
8/2/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
8/9/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
8/16/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
8/23/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
8/30/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
9/6/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
9/13/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
9/20/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
9/27/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
10/4/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
10/11/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
10/18/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper
10/25/2009	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper	Oper

Table

B.4. Weekly Operational Status (ID 14)

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ID 14 Status										
Start date of week	Site ID									
	26262	10693	10699	10720	10721	10722	10724	10731	10655	27192
4/1/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
4/5/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
4/12/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
4/19/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
4/26/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
5/1/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
5/3/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
5/10/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
5/17/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
5/24/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
5/31/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
6/7/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
6/14/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
6/21/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
6/28/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
7/5/2009	Oper	Oper	Oper	N/A	Off	Oper	Oper	Oper	Oper	Oper
7/12/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
7/19/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
7/26/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
8/2/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
8/9/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
8/16/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
8/23/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
8/30/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
9/6/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
9/13/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
9/20/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
9/27/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
10/4/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
10/11/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
10/18/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper
10/25/2009	Oper	Oper	Off	N/A	Off	Oper	Oper	Oper	Oper	Oper

Table B.4 continued Weekly Operational Status (ID 14)

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B.7 Monitored leakage data:

The leakage data collected in accordance with the registered PDD and approved monitoring methodology, AM0016, is provided in Tables B.5 and B.6.

ID 16 Leakage Data											
Month/Year	Site ID										Total
	10602	10603	10604	10610	10611	10626	850191	10687	850201	10692	
Apr-09	1181	1181	1181	1181	1181	1181	1181	1181	1181	1181	11810.7
May-09	1220	1220	1220	1220	1220	1220	1220	1220	1220	1220	12204.4
Jun-09	1181	1181	1181	1181	1181	1181	1181	1181	1181	1181	11810.7
Jul-09	1220	1220	1220	1220	1220	1220	1220	1220	1220	1220	12204.4
Aug-09	1220	1220	1220	1220	1220	1220	1220	1220	1220	1220	12204.4
Sep-09	1181	1181	1181	1181	1181	1181	1181	1181	1181	1181	11810.7
Oct-09	1220	1220	1220	1220	1220	1220	1220	1220	1220	1220	12204.4
											84249.7

Table B.5. Leakage data collected during the monitoring period (ID 16)

ID 16 Leakage Data											
Month/Year	Site ID										Total
	26262	10693	10699	10720	10721	10722	10724	10731	10655	27192	
Apr-09	1181	1181	0	0	0	1181	1181	1181	1181	1181	8267.5
May-09	1220	1220	0	0	0	1220	1220	1220	1220	1220	8543.1
Jun-09	1181	1181	0	0	0	1181	1181	1181	1181	1181	8267.5
Jul-09	1220	1220	0	0	0	1220	1220	1220	1220	1220	8543.1
Aug-09	1220	1220	0	0	0	1220	1220	1220	1220	1220	8543.1
Sep-09	1181	1181	0	0	0	1181	1181	1181	1181	1181	8267.5
Oct-09	1220	1220	0	0	0	1220	1220	1220	1220	1220	8543.1
											58974.8

Table B.5 continued Leakage data collected during the monitoring period (ID 16)

Leakage Data		
Period	ID 16 Energy Consumed kWh	ID 19 Energy produced kWh
1 Jul 08 – 31 Mar 09	143224.422	0

Table B.6. Leakage data collected during the monitoring period

B.8. QA/QC measures applied

B.8.1. QA/QC roles and responsibilities

Complete work instructions and QA/QC roles and responsibilities are listed in the O&M plan. Below is a summary of QA/QC responsibilities and documentation applied for the monitored parameters:

Parameter	Documentation	Performed by	QA/QC check performed by:
Biogas Produced	Monthly Report	RMT	QA, OP
CO2 produced	Reported on Monthly Report; taken quarterly	RMT	QA, OP
Population	Monthly inventory reports	FH, RMT	QA, OP
AWMS Type	Form B	OP	QA, OP
Temperature and Rainfall	NOAA.gov; imported to EnviroCert monthly	IT	QA, OP
Operational Status	Weekly Report	FH, RMT	QA, OP
Power Consumption	24h/7d	IT	QA, OP

FH-Farm Hand, RMT - Regional maintenance technician; QA - quality assurance; OP – operations; IT – Integrated Technology Technician

B.9. Calibration Records

All calibration certificates for Roots meters installed at the sites were provided to the DOE. According to the manufacturer, no calibration after correct installation is required. The flow meter type applied has a tendency to measure lower volumes if there are any operating problems, resulting in rather an underestimation of actual biogas flows. The LandTec Biogas Check gas analyzers are calibrated against bottled gas samples at every farm visited. Every 6 months they are sent back to the manufacturer for recalibration. Calibration records for gas analyzers were provided to the DOE for review and verification.

Section C Equations and calculation methods

C.1 Baseline equations and calculation methods:

Equations 9, 10, 11, 12, 13, 14, 15, and 16 from the UNFCCC-approved methodology AM0016 were used to determine baseline emissions. The baseline was calculated using Equations 9, 10, 11, and 12 for methane emissions and Equations 13, 14, 15, and 16 for nitrous oxide emissions.

Since country-specific factors were not available, values for V_s were calculated based on standard North American animal group weights.

To determine the methane conversion factors (MCF) used with equation 11, IPCC default values were selected for use at the project activity sites.

To determine the nitrogen excretion (N_{ex}) rate used with equations 15 and 16, IPCC default values were selected for use at the project activity sites since country specific factors were not available.

C.2 Project Activity equations and calculation methods:

Equations 9, 10, 11, 12, 13, 14, 15, and 16 from UNFCCC-approved methodology AM0016 were used to determine project activity emissions. The methane (CH_4) emissions for the project activity were calculated using AM0016 equations 9, 10, 11, and 12. The nitrous oxide (N_2O) emissions for the project activity were calculated using Equations 13, 14, 15, and 16. Within these equations, several key parameters and emission factors were utilized.

Since country-specific factors were not available, values for V_s were calculated based on standard North American animal group weights.

To determine the methane conversion factors (MCF) used with equation 11, IPCC default values were selected for use at the project activity sites.

To determine the nitrogen excretion (N_{ex}) rate used with equations 15 and 16, IPCC default values were selected for use at the project activity sites since country specific factors were not available.

C.3 Leakage equations and calculation methods:

Equations 17 to 23 from UNFCCC-approved Methodology AM0016 were used to determine project activity leakage.

Equation 17 was used to determine electrical leakage on a continual basis.

Electrical demand as a consequence of the project activity is mainly from motors and other electrical components. Electrical leakage data is in section B.7 of this monitoring report.

The project developer used equations 18 through 23 in a one-time analysis to confirm that the change in AWMS (project activity) did not adversely affect GHG emissions due to land application, runoff and ammonia volatilization. The results of the analysis show that there is no change in GHG emissions in these areas by incorporating an anaerobic digester.

C.4 Total emission reductions equations and calculation methods:

Equations 24 and 26 from UNFCCC-approved Methodology AM0016 were used to determine project activity emission reductions.

Section D Emission reductions

D.1 Project activity emissions:

Table D.1 shows the sum of project emissions and leakage as the total project activity emissions for the current monitoring period.

D.1 - Total Project Activity Emissions During the Monitoring Period			
Source	GHG Emissions (CO ₂ e) <i>metric tonnes</i>		
	CH ₄	CO ₂	
Project Emissions	6,258		
Leakage		103	
Total:	6,258	103	6,361

D.2 Baseline emissions:

Table D.2 displays baseline emissions for the current monitoring period.

D.2 - Baseline Emissions During the Monitoring Period		
Source	GHG Emissions (CO ₂ e) <i>metric tonnes</i>	
	CH ₄	
AWMS GHG Mitigation Project BR05-B-05, Minas Gerais and Sao Paulo, Brazil	56,334	56,334

D.3 Calculated Emission Reductions:

The project activity emission reductions for the current monitoring period were determined by subtracting the total project activity emissions (Table D.1) from the baseline emissions (Table D.2), as shown in Table D.3

D.3 - Total Project Activity Emission Reductions	
Source	GHG Emissions (CO ₂ e) <i>metric tonnes</i>
Baseline Emissions	56,334
Project Activity Emissions	6,361
Total:	49,973

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D.4 Metered Emission Reductions:

Table D.4 presents emission reductions derived through monitored parameters.

D.4 Metered Project Activity Emissions Reductions (CO ₂ e) during the Monitoring Period			
No.	Site ID	Source	GHG Emissions (CO ₂ e) <i>metric tonnes</i>
1	10602	Fazenda Santa Maria	1,278
2	10603	Fazenda Cachoeirinha	749
3	10604	Fazenda São Vicente	832
4	10610	Fazenda São Francisco	532
5	10611	Fazenda Nova Era	0
6	10626	Granja Pôr do Sol - Finishers	2,302
7	10655	Sítio Nosso Senhor do Bomfim	1,723
8	10687	Suinocultura Martins - Sows	486
9	10692	Fazenda Santo Ignacio de Loyola	1,882
10	10693	Fazenda Barra Preta	1,193
11	10699	Sítio Califórnia	0
12	10720	Fazenda Quintinos	0
13	10721	Fazenda Rio das Pedras	0
14	10722	Fazenda Santa Inês	550
15	10724	Fazenda Bomsucesso	1,093
16	10731	Fazenda Dona Olivia	905
17	26262	Fazenda Santo Ignacio de Loyola Sítio 2	706
18	27192	Fazenda Nossa Senhora da Conceição	2,509
19	850191	Granja Pôr do Sol - Sows	834
20	850201	Suinocultura Martins - Finishers	893
Total:			18,467

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D.5 Lesser of Calculated ERs (D.3) and Metered ERs (D.4):

Table D.5 presents the lesser of calculated emission reductions or metered emission reductions derived through monitored parameters.

In accordance with the methodology, AgCert has used the CERs calculated from inventory data for any sites in which the CERs calculated from inventory data are less than CERs achieved from biogas.

D.5 Lower of Calculated Project Activity ERs and Metered Project Activity ERs by Site						
No.	Site ID	Source	GHG Emissions (CO ₂ e) metric tonnes			Lower of Calculated or Metered ERs
			Calculated Emissions	Metered Emissions	Electrical Leakage	
1	10602	Fazenda Santa Maria	3,034	1,278	6.06	1,272
2	10603	Fazenda Cachoeirinha	1,638	749	6.06	743
3	10604	Fazenda São Vicente	2,228	832	6.06	826
4	10610	Fazenda São Francisco	1,529	532	6.06	526
5	10611	Fazenda Nova Era	2,303	0	6.06	-6
6	10626	Granja Pôr do Sol - Finishers	5,200	2,302	6.06	2,296
7	10655	Sítio Nosso Senhor do Bomfim	6,059	1,723	6.06	1,717
8	10687	Suinocultura Martins - Sows	1,390	486	6.06	480
9	10692	Fazenda Santo Ignacio de Loyola	7,492	1,882	6.06	1,876
10	10693	Fazenda Barra Preta	2,787	1,193	6.06	1,187
11	10699	Sítio Califórnia	294	0	0.00	0
12	10720	Fazenda Quintinos	0	0	0.00	0
13	10721	Fazenda Rio das Pedras	0	0	0.00	0
14	10722	Fazenda Santa Inês	2,350	550	6.06	544
15	10724	Fazenda Bomsucesso	1,911	1,093	6.06	1,087
16	10731	Fazenda Dona Olívia	2,235	905	6.06	899
17	26262	Fazenda Santo Ignacio de Loyola S	2,715	706	6.06	700
18	27192	Fazenda Nossa Senhora da Conceição	3,648	2,509	6.06	2,503
19	850191	Granja Pôr do Sol - Sows	2,002	834	6.06	828
20	850201	Suinocultura Martins - Finishers	1,259	893	6.06	887
Total:						18,364

E. Comparison of actual ERs to PDD estimated ERs

E.1 Emission reduction estimated for this monitoring period

Source	Dates		ERs
	From	To	
Registered PDD Estimate	1 Apr 2009	31 Oct 2009	45,931

E.2 Emission reduction actually achieved during this monitoring period

Source	Dates		ERs
	From	To	
Actual emission reductions claimed during this monitoring period	1 Apr 2009	31 Oct 2009	18,364

E.3 Explanation on any significant increase between estimated and claimed emission reductions

There was no significant increase between the registered PDD and claimed emission reductions during this period