



VERIFICATION AND CERTIFICATION REPORT

- 4TH PERIODIC –

PROACTIVA MEIO AMBIENTE - BRASIL

PROACTIVA TIJUQUINHAS LANDFILL GAS
CAPTURE AND FLARING PROJECT

UNFCCC REF. No. : 1506

Monitoring Period: 2011-12-01 to 2013-04-30
(incl. both days)

Report No: 9450 – 13/026

Date: 2014-05-15

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-2139
www.tuev-nord.de
www.global-warming.de

Verification Report:	Report No.	Rev. No.	Date of 1st issue:	Date of this rev.
	9450 – 13/026	0	2014-05-15	2014-05-15
Project:	Title:	Registration date:	UNFCCC-No.:	
	Proactiva Tijuquinhos Landfill Gas Capture and Flaring Project	2008-08-13	1506	
		Verification No.:	4th periodic verification	
	Crediting period:	From:	To:	
	<input checked="" type="checkbox"/> Renewable (7y) <input type="checkbox"/> Fixed (10y)	2008-10-29	2015-10-28	
	Project Scale:			
	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale			
Project Participant(s):	Client:			
	Proactiva Meio Ambiente - Brasil			
	Non Annex 1 country:	Annex 1 country:		
	Brazil	Spain France		
	PP from non-Annex 1 country:	PP from Annex 1 country:		
	Proactiva Meio Ambiente - Brasil	Proactiva Medio Ambiente (Spain) Veolia Propreté (France)		
Applied methodology/ies:	Title:	No.:	Scope(s) / TA(s)	
	Consolidated baseline and monitoring methodology for landfill gas project activities	ACM0001- ver. 5	13 / 13.1	
Monitoring period and monitoring report	Monitoring period (MP):		Monitoring Report:	
	From:	To:	No. of days:	Draft version:
	2011-12-01	2013-04-30	517	2013-05-06 – v. 01
				2014-04-29 – v. 03
Verification team / Technical Review and Final Approval:	Verification Team:		Technical review:	Final approval:
	Sergio Cruz Marcelo Sebben		Emilio Martin	Alexandra Nebel
Key dates of verification:	Publication of MR :	DVerR issued:	On-site (from):	On-site (to):
	2013-05-08	2013-05-29	2013-05-28	2013-05-29
Summary of Verification opinion	<p>Proactiva Meio Ambiente - Brasil has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 4th periodic verification of the project: "Proactiva Tijuquinhos Landfill Gas Capture and Flaring Project", with regard to the relevant requirements for CDM project activities.</p> <p>As a result of this verification, the verifier confirms that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> all operations of the project are implemented and installed as planned and described in the validated project design document, <input checked="" type="checkbox"/> the monitoring plan is in accordance with the applied approved CDM methodology, <input checked="" type="checkbox"/> the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately, <input checked="" type="checkbox"/> the monitoring system is in place and functional. The project has generated GHG emission reductions, and <input checked="" type="checkbox"/> the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. <p>TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as listed below (verified amount).</p>			



Emission reductions: [t CO _{2e}]	Total verified amount	As per draft MR:	As per PDD:
	320,505	314,964	299,411*
		ER achieved up to 2012-12-31	ER achieved from 2013-01-01
		233,619	86,886
Document information:	Filename:		No. of pages:
	2014-05-15_FVer_Tijuquinhas_4_final.docx		119

* Estimated at the registered PDD for 31 days of 2011, 366 days of 2012 and 120 days of 2013. With the updated value of GWP_{CH_4} for the months of January, February, March and April/2013, the estimated value is 314,964 tCO₂.

Abbreviations:

CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
CL	Clarification Request
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
FATMA	Environmental Foundation of the State of Santa Catarina
GHG	Greenhouse gas(es)
IBAMA	Brazilian Institute for the Environment
LFG	Landfill Gas
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
USEPA	United States Environmental Protection Agency
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

Table of Contents	Page
1. INTRODUCTION	7
1.1. Objective	7
1.2. Scope	7
2. GHG PROJECT DESCRIPTION.....	9
2.1. Technical Project Description	9
2.2. Project Location	9
2.3. Project Verification History	10
3. METHODOLOGY AND VERIFICATION SEQUENCE	12
3.1. Verification Steps	12
3.2. Contract review	12
3.3. Appointment of team members and technical reviewers	12
3.4. Publication of the Monitoring Report	13
3.5. Verification Planning	13
3.6. Desk review	15
3.7. On-site assessment	16
3.8. Draft verification reporting	17
3.9. Resolution of CARs, CLs and FARs	17
3.10. Final reporting	18
3.11. Technical review	18
3.12. Final approval	18
4. VERIFICATION FINDINGS.....	19
5. SUMMARY OF VERIFICATION ASSESSMENTS	23
5.1. Involved Parties and Project Participants	23
5.2. Implementation of the project	23
5.3. Project history	25
5.4. Post registration changes	26
5.5. Compliance with the monitoring plan	26
5.6. Compliance with the monitoring methodology	28
5.7. Monitoring parameters	28
5.8. Monitoring report	30
5.9. Sampling	30
5.9.1. Implementation of the sampling plan	30
5.9.2. Sampling approaches during verification	30
5.10. ER Calculation	31



5.11.	Quality Management	31
5.12.	Actual emission reductions during the first commitment period and the period from 1 January 2013 onwards	32
5.13.	Comparison with ex-ante estimated emission reductions	32
5.14.	Overall Aspects of the Verification	33
5.15.	Hints for next periodic Verification	33
6.	VERIFICATION AND CERTIFICATION STATEMENT	34
7.	REFERENCES	35
	ANNEX 1: VERIFICATION PROTOCOL	46
	ANNEX 2: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL	119

1. INTRODUCTION

Proactiva Meio Ambiente - Brasil has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 4th periodic verification of the project

“Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project”

with regard to the relevant requirements for CDM project activities. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered CDM project.

GHG data for the monitoring period was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Standard^{/VVS/} of the UNFCCC.

This report summarizes the findings and conclusions of this 4th periodic verification of the above mentioned UNFCCC registered project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- implementation and operation of the project activity as given in the PDD,
- compliance with applied approved methodology and the provisions of the monitoring plan,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- accuracy of the monitoring equipment,
- quality of evidence,
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the validated project design document^{/PDD/}, the monitoring report^{/MR/}, emission reduction calculation spread sheet^{/XLS/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

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

- Article 12 of the Kyoto Protocol^{/KP/},
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1^{/MA/}, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,



-
- CDM Validation and Verification Standard^{/VVS/},
 - monitoring plan as given in the registered PDD^{/PDD/},
 - Approved CDM Methodology.

2. GHG PROJECT DESCRIPTION

2.1. Technical Project Description

The key parameters of the project are given in Table 2-1:

Table 2-1: Technical data of the project activity

Parameter	Unit	Value
<u>Flares</u>		
Quantity		02
Manufacturer		GRS Valtech
Model		BG2000
Nominal Power	kW	10,000
Capacity of biogas of 50% CH ₄	Nm ³ /h	300 to 2,000
Flame temperature	°C	500 to 1,200
<u>Blowers</u>		
Quantity		03
Manufacturer		Continental Industrie
Type		051.04 - turbine 4212
Electric Power	kW	45
Turbine Rotation	rpm	3,590
Engines Power	kW	45
- Engine 01 (ATB)		serial #480031002H
- Engine 02 (WEG)		serial #OC43192
- Engine 03 (WEG)		serial #OC58408
<u>Generator group</u>		
Quantity		01
Manufacturer		Stemac
Model		CRAMACO G2R
Serial		015753009
Power	kVA	150/141

2.2. Project Location

The details of the project location are given in Table 2-2:

Table 2-2: Project Location

No.	Project Location
Host Country	Brazil
Region:	City of Biguaçu – State of Santa Catarina
Project location address:	BR 101 – km 177.6
Latitude:	6970;6972 South
Longitude:	732;734 East

2.3. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-3.

Table 2-3: Status of previous Monitoring Periods

#	Item	Time	Status
1	1 st Monitoring period	2008-10-29 to 2010-08-31	Issued
2	2 nd Monitoring period	2010-09-01 to 2011-03-31	Issued
3	3 rd Monitoring period	2011-04-01 to 2011-11-30	Issued
4	4 th Monitoring period	2011-12-01 to 2013-04-30	Awaiting Issuance Request

An overview of all Post Registration Changes is given in the following table.

Table 2-4: Overview Post Registration Changes

#	Applicable from – to / as of	MP	Type of post registration change ¹⁾	Description	Status ²⁾ / Date
1	29-Oct-2008 to 31-Aug-2010	1 st	TDfrMP	I-DEV0404: The parameter “Total amount of electricity imported to meet project requirement” has not been archived electronically monthly as stated in the MP of the registered PDD. Electricity import is however continuously measured by an electricity meter and the equipment keeps the data of the accumulated electricity.	Approved / Accepted 2011-05-03
2	2010-09-01 onwards	2 nd 3 rd 4 th	CoPD	Installation of a diesel generator group dedicated to the CDM project; and increase of the figures for waste input annual growth rate, maximum capture rate of phases 1 and 2 and project electricity consumption.	Approved / Accepted 2011-08-24
3	2010-09-01 to 2012-01-07	2 nd 3 rd 4 th (partial)	TDfMM	PRC-1506-001: the measurement of the exhaust gas temperature of the flare was changed to the upper part at 80% of total flare height as no emission reductions should be claimed when the temperature of the exhaust gas of the flare (at 80% of total height) is less than 500°C.	Approved / Accepted 2012-08-28

¹⁾ TDfrMP : Temporary deviation from registered monitoring plan



-
- | | | |
|-------|---|--|
| TDfMM | : | Temporary deviation from the monitoring methodology |
| CrPDD | : | Corrections to the registered PDD |
| PCfMP | : | Permanent changes from registered Monitoring Plan |
| PCfMM | : | Permanent changes from Monitoring Methodology |
| CoPD | : | Changes to the project design of a registered project activity |
- 2) Approval (by EB) or Acceptance (by DOE)

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review;
- Appointment of team members and technical reviewers;
- Publication of the monitoring report;
- A desk review of the Monitoring Report^{/MR/} submitted by the client and additional supporting documents with the use of customized verification protocol^{/CPM/} according to the Validation and Verification Standard^{/VVS/};
- Verification planning;
- On-Site assessment;
- Background investigation and follow-up interviews with personnel of the project developer and its contractors;
- Draft verification reporting;
- Resolution of corrective actions (if any);
- Final verification reporting;
- Technical review;
- Final approval of the verification.

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held;
- the necessary competences to carry out the verification can be provided;
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consisting of one team leader and 1 additional team member, was appointed.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the Table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme competence ³⁾	Technical competence ⁴⁾	Verification competence ⁵⁾	Host country Competence	On-site visit
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Sergio Cruz	BRTÜV	TL	LA	<input checked="" type="checkbox"/>	13.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Marcelo Sebben	BRTÜV	TM	A	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Martin Emilio	TÜV Nord, Germany	TR ^{B)}	SA	<input checked="" type="checkbox"/>	13.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Alexandra Nebel	TÜV Nord, Germany	FA ^{B)}	SA	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹⁾ TL: Team Leader; TM: Team Member; TR: Technical review; OT: Observer-Team; OR: Observer-TR; FA: Final approval

²⁾ GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

³⁾ GHG auditor status (at least Assessor)

⁴⁾ As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

⁵⁾ In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

All team members contributed to the review of documents, the assessment of the project activity and to the preparation of this report under the leadership of the team leader.

Statements of competence for the above mentioned team members are enclosed in annex 2 of this report.

3.4. Publication of the Monitoring Report

In accordance with the CDM M&P (§ 62) the draft monitoring report, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the verification activity commenced. Comments received are taken into account in the course of the verification, if applicable.

3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in Table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
<i>The following potential risks were identified and divided and structured according to the possible areas of occurrence.</i>	<i>The potential risks of raw data generation have been identified in the course of the monitoring system implementation. The following measures were taken in order to minimize the corresponding risks.</i> <i>The following measures are implemented:</i>	<i>Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.</i>	<i>The additional verification testing performed is described. Testing may include:</i> <ul style="list-style-type: none"> - Sample cross checking of manual transfers of data - Recalculation - Spreadsheet 'walk throughs' to check links and equations - Inspection of calibration and maintenance records for key equipment - Check sampling analysis results <i>Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.</i>	<i>Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.</i>

The completed table A-1 is enclosed in Annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in Table 3-3.

Table 3-3: Table A-2; Structure of the project specific periodic verification checklist

Table A-2: Periodic verification checklist				
Checklist Item	Reference	Verification Team Comments	Draft Conclusion	Final Conclusion
<i>The checklist items in Table A-2 are linked to the various requirements the monitoring of the project should meet. The checklist is organized in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.</i>	<i>Gives reference to the information source on which the assessment is based on.</i>	<i>The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the VVS shall be covered in this section.</i>	<i>Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft verification stage.</i>	<i>In case of a corrective action or a clarification the final assessment at the final verification stage is given.</i>

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in Annex 1 (table A-2) to this report.

3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan^{/PDD/},
- the last revision of the validation report^{/VAL/},
- documentation of previous verifications^{/VER/}

- the monitoring report, including the claimed emission reductions for the project^{/MR/},
- the emission reduction calculation spreadsheet^{/XLS/}.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The monitoring data were checked completely.
- An assessment of the implementation and operation of the registered project activity as per the registered PDD or any approved revised PDD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;
- A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and corresponding tool(s), where applicable;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.
-

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of Proactiva Meio Ambiente - Brasil including the operational staff of the plant were interviewed. The main topics of the interviews are summarized in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel 2. Consultant	<ul style="list-style-type: none">- General aspects of the project- Technical equipment and operation- Changes since validation / previous verification- Monitoring and measurement equipment- Remaining issues from validation/ previous verification- Calibration procedures- Quality management system- Involved personnel and responsibilities- Training and practice of the operational personnel- Implementation of the monitoring plan- Monitoring data management- Data uncertainty and residual risks- GHG emission reduction calculation- Procedural aspects of the verification- Maintenance- Environmental aspects

The list of interviewees is included in chapter 7.4.

3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.9. Resolution of CARs, CLs and FARs

Nonconformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- 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 which will impair the estimate of emission reductions;

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

The verification team uses the term Clarification Request (CL), which is issued if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

3.10. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.11. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.12. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report^{/MR/}, the calculation spreadsheet^{/XLS/}, PDD^{/PDD/}, the Validation Report^{/VAL/} and other supporting documents, as well as from the on-site assessment and the interviews are summarized.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CL and FAR

Verification topic	No. of CAR	No. of CL	No. of FAR
A – Description of project activity	0	0	0
B – Implementation of project activity	1	0	0
C – Description of monitoring system	1	0	0
D – Data and parameters	0	0	0
E - Calculation of Emission Reductions	0	1	0
SUM	2	1	0

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Finding	B1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	At Section B.1, it is missing: <ul style="list-style-type: none"> a. events that cause downtimes and interruption of the activity with respective actions taken; b. equipment exchanges. Associated questions: B.1.2; B.1.4		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In</i>	a. Information regarding events that caused downtimes and interruption of the activity was added at Section B1, Table 1. All the events that led to a loss of CERs for a period greater		

Finding	B1		
case the MR is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.	<p>than 6 hours were described with respective actions taken.</p> <p>b. Information regarding equipment exchanges was provided at Section B1, Table 2.</p>		
	<input checked="" type="checkbox"/> Changes in MR	Section(s): B.1	New version No.: 2
	<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Section B.1 has been revised and events that cause downtimes and interruption of the activity, actions taken and equipment exchanges have been included.</p> <p><u>CAR is closed</u></p>		
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the next periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>		

Finding	C1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>It was verified during the site visit that the new thermocouples for Flare 1 (TC-CR11189/12) and 2 (TC-CR11190/12) have been installed after the expiration of the validity of the calibration of the replaced ones (TC-CR12909/11 – Flare 1; TC-CR12908/11 – Flare 2).</p> <p>This information is missing at Section C and the necessary actions have not been considered at the ER calculations.</p> <p>Associated questions: D.2.15; D.2.16; E.3; E.4; E.5</p>		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.</i>	<p>It was identified that the last substitutions of both Flare 1 and Flare 2 thermocouples by new calibrated instruments on 13/12/2012 occurred a few hours after the expiration of the previous calibration certificates:</p> <p>a. The substitution of the Flare 1 thermocouple ($T_{\text{flare 1}}$) was performed one day after the date required as per the calibration frequency requirement (annual substitution or calibration). No measurement of the drift of the replaced thermocouple is available. Therefore, for purpose of conservativeness, the PPs have chosen not to claim CERs for Flare 1 during the non-compliance period which ranges from 13/12/2012 00:00:00 GMT-2 to 13/12/2012 15:53:56 GMT-2 (the new calibrated instrument was installed around 15:40:00 as per evidence provided from data logger record).</p> <p>b. The substitution of the Flare 2 thermocouple ($T_{\text{flare 2}}$) was performed one day after the date required as per the calibration frequency requirement (annual substitution or calibration). No</p>		

Finding	C1
	<p>measurement of the drift of the replaced thermocouple is available. Therefore, for purpose of conservativeness, the PPs have chosen not to claim CERs for Flare 2 during the non-compliance period which ranges from 13/12/2012 00:00:00 GMT-2 to 13/12/2012 16:29:33 GMT-2 (the new calibrated instrument was installed around 15:55:00 as per evidence provided from data logger record).</p> <p>c. As a result of this conservative approach, the total quantity of emissions reductions claimed for the 4th Monitoring Period was reduced by 400 tCO₂e from 320,905 tCO₂e to 320,505 tCO₂e.</p>
	<input checked="" type="checkbox"/> Changes in MR Section(s): C New version No.: 2 <input type="checkbox"/> Changes in XLS Worksheet(s): New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The information about the delay in the substitution of the thermocouples has been included at Section C.</p> <p>In addition, conservatively, the PP has decided not to claim CERs for the period of this delay which has impacted the ERs calculations.</p> <p>Thus, the calculations have been correctly revised and a decrease in the ERs has been verified and the figure has been properly corrected throughout the MR.</p> <p><u>CAR is closed</u></p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	E1
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>At Table 6 of Section E.6, the total amount of waste input for the months of January, February, March and April of 2013 is not provided.</p> <p>Associated questions: E.5</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the MR is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.</i>	<p>The total amount of waste input was provided for the first 4 months of 2013. Comparison between real waste input and PDD forecast was updated until April 2013 included. In order to account for seasonal variation of waste input, comparison between PDD and reality for the first 4 months of 2013 was made through historical ratio between total waste input over the year 2012 and waste input from January to April of 2012. The same assumption was adopted to calculate annual growth rate of real waste input from 2012 to</p>



Finding	E1		
	2013. The section E.6 of the monitoring report was updated accordingly. The conclusion of comparison between PDD estimates and claimed emission reductions over the 4 th monitoring period remains unchanged.		
	<input checked="" type="checkbox"/> Changes in MR	Section(s): E.6	New version No.: 2
	<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Table 6 has been filled up properly with the data of the months of 2013 which allows a correct comparison among estimated ERs in the PDD and actual figures. <u>CL is closed</u>		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CLs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity.

Table 5-1: Project Parties and project participants

Characteristic	Party	Project Participant
Non-Annex 1	Brazil	Proactiva Meio Ambiente - Brasil
Annex 1	Spain	Proactiva Medio Ambiente
	France	Veolia Propreté (France)

5.2. Implementation of the project

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipment, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the registered PDD.

Proactiva Tijuquinhas Landfill Gas Capture and Flaring project is a landfill gas capture and flaring at the Tijuquinhas municipal solid waste landfill in the state of Santa Catarina, southern Brazil.

The project implementation is divided in two main phases:

1. Landfill gas network: which is continuous as the collection system is improved as the landfill increases its activities;
2. Blowers and flares plant: which is also divided in the installation of the first enclosed flare (Oct 2008) and the installation of the second enclosed flare (Jan 2009).

The landfill was divided in zones depending of the time of its use of receiving the waste, and the implementation of the equipment (for phases 1 and 2) have followed this division over time.

They are as follows:

- a. Zone 1 has received waste between 1991 and 2004. The gas collection system (9 horizontal drains interconnected with existing wells) was installed in 2008.
- b. Zone 2 has received waste between 2004 and 2007. The gas collection system (10 horizontal drains interconnected with 24 vertical wells and 6 additional vertical wells directly connected to the main carriers) was installed in 2008.
- c. Zone 3-A has received waste between 2007 and 2009. The gas collection system installation began in 2008. Extensions were provided as landfilling progressed until final elevation was reached at the end of 2009. The initial gas collection system was composed by 14 horizontal drains interconnected with 33 vertical wells. It was completed by 2 horizontal drains (November 2012) to increase the collection efficiency.
- d. Zone 3-B has received waste between January 2010 and May 2012. The gas collection system installation started on 2010 and it was completed in October 2012 to improve the collection efficiency.
- e. Zone 3-C: start receiving waste on May 2012 and it is the current disposal area. The existing vertical wells of Zones 3-A and 3-B were extended up to Zone 3-C. 7 horizontal drains interconnected with the vertical wells were installed and put in operation in order to collect gas in the new disposal areas.

Thus, the landfill gas network has been installed from 2008 and continues to be implemented. In addition, the thickness of the temporary soil cover was increased from 30 to 40 cm on the landfill main platform in order to reduce landfill gas fugitive emissions.

Those new implementations are in accordance with the registered PDD as the purpose of the project activity is to improve the gas collection and leachate collection and treatment.

In addition, three blowers and two high efficiency enclosed 2000 Nm³/hour flares and several operation and measuring equipment have also been installed during the period.

The main equipment (flare, blower incl. engines) were not exchanged or modified during the monitoring period.

Some monitoring equipment has been exchanged, due to the end of operational life.

A diesel generator group has been installed on 2010-09-01. This change was approved by the Board on 2011-08-24.

The monitoring instruments are installed. The measuring devices are in good condition and following the supplier's recommendations about calibrations (when this could not be done, the appropriate measures for potential deviations have been taken). For further information, refer to Annex 1 – Table A-2 of this Report.

5.3. Project history

The project has been registered on 2008-08-13 (reference number 1506); the starting date of the crediting period was 2008-10-29 and this 4th monitoring period is from 2011-11-30 to 2013-04-30 (both days included).

During the validation, the validating DOE did not raise issues that could not be closed or resolved during the validation stage.

The project history is listed below:

- a Request for Deviation has been submitted and approved (2011-05-03) prior to the request for issuance of the first monitoring period to address a discrepancy in the monitoring and archiving of monitoring parameter *Electricity Imported*.
- two issues have been raised on the first verification and both have been addressed to the UNFCCC by a Notification for Changes which has been approved on 2011-08-24:
 - o the installation of a diesel generator group on 2010-09-01;
 - o an increase between the claimed emission reductions and the estimated ones in the registered PDD caused by higher amounts of waste received by the landfill and an increase in the collection efficiency compared to PDD forecast.

A revision of MP has been requested and approved with the above mentioned Notification for Changes as it is necessary to monitor the project emissions from displaced emissions due to the electricity consumption from the grid and also from on-site emissions due to the electricity consumption of the diesel generator.

- a request for temporary post-registration changes to the CDM project activity has been submitted to the EB and approved on 2012-08-29. The request was necessary because instead of monitoring the flare temperature at 80% of total height, it has been observed that the parameter T_{flare} was being monitored right above the combustion zone (lower part) of the flare. The incorrect procedure has been performed from 2010-09-01 until 2012-01-07 (both days included). The procedure has been revised and from 2012-01-07 onwards, the procedure is in accordance with the registered monitoring plan.

Because of this TDfMM, a FAR was opened at the previous verification. As per the above approval, from 2011-12-01 to 2012-01-07 (both days included), the emission reductions were calculated taking into account such requirement on flare temperature. It does result in a decrease of 42 tCO₂e from the total emission reductions claimed over the 4th monitoring period.

5.4. Post registration changes

No post registration changes applicable for this monitoring period have been observed during the monitoring period.

5.5. Compliance with the monitoring plan

The monitoring system and all applied procedures are completely in compliance with the registered monitoring plan.

A Request for Deviation was done to address the inconsistency with the MP of the PDD which requires that parameter 'Temperature in the exhaust gas of the flare' (T_{flare}) to be monitored in the exhaust gas. During the monitoring period this has not been done as requested. This Request for post-registration changes for the period from 2010-09-01 to 2012-01-07 was approved by the UNFCCC on 2012-08-29. The correct procedure of monitoring parameter T_{flare} has been implemented from 2012-01-05 at 5:00 PM (local time) onwards for Flare 1 and from 2012-01-07 at 9:30 AM (local time) onwards for Flare 2. To be conservative, the date of 2012-01-07 was considered for both flares as the day when the monitoring of the temperature started to be done at 80% of the total flare height and the proposed correction on the emission reductions will be applied until then for deviation purposes. Therefore, from 2011-12-01 to 2012-01-07 (both days included), the emission reductions were calculated taking into account such requirement on flare temperature. It does result in a decrease of 42 tCO₂e from the total emission reductions claimed over the 4th monitoring period.

The submitted monitoring report which is the basis of the verification was prepared by summarizing consolidated monthly data over the whole monitoring period in accordance with the monitoring plan of the registered PDD. The procedures are totally in compliance with the directives of the approved monitoring plan which could be confirmed by plant operators and CDM project manager during the site visit.

In addition, several events^{/DOWN/} (> 6 hours) happened during the monitoring period which caused the interruption of the project activity, as follows:

- from 2012-02-05 - 20:16:18 to 2012-02-06 - 07:28:18 – a power blackout caused the shutdown of the plant – no CERs claimed for the period;
- from 2012-02-21 - 01:48:18 to 2012-02-21 - 14:12:18 – connection failure at the output of the gas analyzer stopped the data transmission – no CERs claimed for the period;
- from 2012-06-03 - 07:40:51 to 2012-06-03 - 15:52:51 – power blackout caused the shutdown of the plant – no CERs claimed for the period;
- from 2012-08-18 - 13:51:15 to 2012-08-18 - 20:03:15 – power blackout caused the shutdown of the plant – no CERs claimed for the period;

-
- from 2012-08-19 - 21:00:51 to 2012-08-20 - 10:24:13 – connection failure at the output of the gas analyzer stopped the data transmission – no CERs claimed for the period;
 - from 2012-08-25 - 23:44:13 to 2012-08-26 - 08:21:19 – a power blackout caused the shutdown of the plant – no CERs claimed for the period;
 - from 2012-09-03 - 20:28:13 to 2012-09-06 - 13:15:01 – the motherboard of the gas analyzer was damaged – no CERs claimed for the period;
 - from 2012-10-15 - 14:32:30 to 2012-10-16 - 06:37:16 – lack of data relative to Flare 1 due to unidentified reason – no CERs claimed for Flare 1 for the period;
 - from 2012-12-02 - 07:50:56 to 2012-12-02 - 14:13:33 – a power blackout caused the shutdown of the plant – no CERs claimed for the period;
 - from 2012-12-12 - 23:58:56 to 2012-12-13 - 15:53:56 – the calibration of Flare 1 thermocouple was valid until 2012-12-12. It was substituted by a new calibrated thermocouple on 2012-12-13 around 15:40:00 – no CERs claimed for Flare 1 for the period;
 - from 2012-12-12 - 23:58:56 to 2012-12-13 - 16:29:33 – the calibration of Flare 2 thermocouple was valid until 2012-12-12. It was substituted by a new calibrated thermocouple on 2012-12-13 around 15:55:00 – no CERs claimed for Flare 2 for the period;
 - from 2013-01-01 - 21:13:56 to 2013-01-02 - 07:45:33 – a power blackout caused the shutdown of the plant – no CERs claimed for the period.

Moreover, the following equipment has been exchanged:

- 2012-01-11: Flare 1 temperature transmitter PT100-CR01106/11 has been exchanged by PT100-CR12910/11;
- 2012-01-11: Flare 1 thermocouple TC-CR01107/11 has been exchanged by TC-CR12909/11;
- 2012-01-11: Flare 2 thermocouple TC-CR01108/11 has been exchanged by TC-CR12908/11;
- 2012-06-26: Flare 1 absolute pressure transmitter A7F9668F/C282814 has been exchanged by A7F9666F/C282803;
- 2012-07-16: Flare 1 absolute pressure transmitter A7F9666F/C282803 has been exchanged by A7F9668F/C282814;
- 2012-07-16: Flare 2 absolute pressure transmitter A7F9667F/C282810 has been exchanged by A7F9666F/C282803;
- 2012-08-01: Flare 2 absolute pressure transmitter A7F9666F/C282803 has been exchanged by A7F9667F/C282810;
- 2012-09-21: Flare 2 temperature transmitter PT100-CR09923/11 has been exchanged by PT100-LV34114-12;

- 2012-12-13: Flare 1 temperature transmitter PT100-CR12910/11 has been exchanged by PT100-CR11191/12;
- 2012-12-13: Flare 1 thermocouple TC-CR12909/11 has been exchanged by TC-CR11189/12;
- 2012-12-13: Flare 2 thermocouple TC-CR12908/11 has been exchanged by TC-CR11190/12.

And, the following calibrations have been performed of the microprocessor electricity meter with impact to the project activity:

- at the calibration of 2011-03-24, an error of -3.51% has been identified;
- at the calibration of 2012-02-16, an error of -3.18% has been identified;
- at the calibration of 2013-04-16, an error of -1.0% has been identified;

Although there was a delay of 2 months between the 2nd and 3rd calibrations, being more conservative, as the first two calibrations presented errors above the permissible error of the equipment (+/- 3.0%) – correction of 3.51% was applied in the ER calculation for the whole monitoring period.

Moreover, as there was a delay in the calibration or substitution of the thermocouple of Flare 1 (from 00:00 until 15:53:56 of 2012-12-13), no CERs have been claimed for this period for Flare 1; and as there was a delay in the calibration or substitution of the thermocouple of Flare 2 (from 00:00 until 16:29:33 of 2012-12-13), no CERs have been claimed for this period for Flare 2.

During the monitoring period, the achieved emission reductions are 18,397 tCO₂e in 2011; 215,222 tCO₂e for 2012; and 86,886 for 2013. The total emission reductions for the whole monitoring period are **320,505 tCO₂e**.

This could be verified by the verification team during the on-site visit by checking the records and cross checking the data by stimulation of the calculations.

5.6. Compliance with the monitoring methodology

The monitoring system is in compliance with the applied monitoring methodology (ACM0001: “Consolidated baseline and monitoring methodology for landfill gas project activities” – version 5).

The monitoring report and emissions reduction calculations are in line with the requirements of the validated monitoring plan as well as with the applied methodology.

The reporting procedures reflect the requirements of the monitoring plan.

5.7. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in chapter 7.1 of the PDD) have been verified with regard to the appropriateness of the applied

measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedures are described parameter-wise in the project specific verification checklist.

After appropriate corrections carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

The following parameters were checked by the verification team:

1. Total amount of landfill gas captured for flare stack 1 – (LFG_{flare1} for flare stack 1);
2. Total amount of landfill gas captured for flare stack 2 – (LFG_{flare2} for flare stack 2);
3. Project emissions from flaring of the residual gas stream through flare stack 1 – (PE_{flare1} for flare stack 1);
4. Project emissions from flaring of the residual gas stream through flare stack 2 – (PE_{flare2} for flare stack 2);
5. Methane fraction in the landfill gas – (W_{CH4});
6. Temperature of the landfill gas delivered to flare stack 1 – (T_1);
7. Temperature of the landfill gas delivered to flare stack 2 – (T_2);
8. Pressure of the landfill gas delivered to flare stack 1 – (P_1);
9. Pressure of the landfill gas delivered to flare stack 2 – (P_2);
10. Total amount of electricity imported to meet project requirement (from both grid and diesel generator) – (EL_{IMP});
11. Regulatory requirements relating to landfill gas projects;
12. Volumetric fraction of component i in the residual dry gas where $i = CO_2, O_2$ – (fv_i);
13. Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions – ($fv_{CH4,FG}$);
14. Volumetric fraction of O_2 in the exhaust gas of the flare – (t_{O2});
15. Temperature in the exhaust gas of the flare stack 1 – (T_{flare1} for flare stack 1);
16. Temperature in the exhaust gas of the flare stack 2 – (T_{flare2} for flare stack 2).

For further information, refer to Annex 1 – Table A-2, section D where each monitored parameter was fully assessed. The measurement readings are carried out continuously and then consolidated by the plant operators. The records and consolidated data are the basis for the calculation of the emissions reduction. All relevant evidences were fully checked by the verification team during the site visit. The necessary monitoring instruments are installed. The measuring devices were in

good conditions and found to be accurate and reliable. The required instruments are installed and their operating procedures have been implemented. Calibration procedures and test reports for all meters, sensors and transmitters covering the reported monitoring period were verified as for their frequency and traceability to industry standards. Calibration records of all installed meters were checked and deemed satisfactory. All calibration certificates are valid for this monitoring period; nevertheless there is an interval when the calibration had not been done as scheduled (in which a proper correction factor has been applied to the calculations of the emission reductions). The calibration details are stated in tables 4 and 5 of the monitoring report.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan. No significant lack of evidence and missing data were detected during the on-site verification.

5.8. Monitoring report

A draft monitoring report was submitted to the verification team by the project participants. The team has made this report publicly available prior to the start of the verification activities. No comments were received.

During the verification, mistakes and needs for clarification were identified. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring Report is complete and transparent and in accordance with the registered PDD and other relevant requirements.

In the process of the verification, 02 CARs and 01 CL were raised and successfully closed.

The findings are described in Section 4 of this Report.

5.9. Sampling

5.9.1. Implementation of the sampling plan

No sampling was required to determine the monitored parameters.

5.9.2. Sampling approaches during verification

The verification team has checked the presented data of the parameters the raw data directly from the system. Exhausting checking with all parameters in different dates, times (including downtimes) has been performed and the verification team could verify the integrity and accuracy of the presented information.

In addition, the verification team could testify the robustness of the system and inviolability of the information.

5.10. ER Calculation

During the verification, some mistakes in the ER calculation have been properly corrected.

The PP has correctly considered the minimum temperature of 780°C for the monitored flare temperature (combustion zone) in order to claim emission reductions from 2011-12-01 to 2012-01-07 (both days included), as per the approved TDfMM (FAR from previous verification).

In addition, the PP has conservatively applied the correction of 3.51% for the whole monitoring period due to the presented errors above the permissible error of the equipment microprocessor electricity meter at 2 calibrations.

Thus it is confirmed that the ER calculation is overall correct.

5.11. Quality Management

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this CDM project activity have been defined.

Although the GHG data monitoring system is not embedded in a certified quality management system yet, a CDM Department has been implemented and a robust monitoring system following principles of quality management system has been developed and implemented for the monitoring of the project activity.

The monitoring system covers:

1. organizational structure of the CDM department;
2. internal audits procedures;
3. training plan;
4. handling data procedures;
5. data collection, analysis and calculation procedures;
6. data checking and storage procedures;
7. roles and responsibilities.

The verification team was able to check the consistency of the procedures by interviews and reports. The organogram of the landfill with roles and positions could be clearly verified and implemented as stated in the monitoring plan.

In addition, the involved personnel is properly trained and qualified for their tasks. The supplier of the flare equipment has provided training to all personnel when the project activity was implemented. All training certificates have been presented.

Procedures in case of equipment failure or accidents are established and well defined. Automatic alarms and emergency calls are implemented procedures of the project activity.

Moreover, a landfill responsible has full access to the CDM department supervisor at any time.

The actions taken in case of equipment failures are documented in detail.

Regular maintenance of biogas plant equipment and monitoring equipment is carried out on regular basis (maintenance spreadsheets have been presented).

Procedures for internal QA/QC have been established and implemented as described in detail in the MR for each parameter, and include annual calibration or substitution of monitoring equipment, auto calibration of some monitoring equipment, plausibility checks performed daily by plant operator with portable devices and regular data backup. All calibration certificates have been presented to the verification team.

Also, procedures for data archive and protection are in place and implemented in the project activity.

The procedures defined can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during the verification.

5.12. Actual emission reductions during the first commitment period and the period from 1 January 2013 onwards

The MR includes actual ER values achieved up to 31 December 2012 and actual values achieved from 1 January 2013 onwards as follows:

Table 5-2: Emission reductions before and after the end of 2012

	until 2012-12-31 ¹⁾	from 2013-01-01 ¹⁾	Sum
Emission reductions [tCO _{2e}]	233,619	86,886	320,505

¹⁾ Both days included

5.13. Comparison with ex-ante estimated emission reductions

The MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered PDD.

An increase of 1.76% in the emission reductions in comparison with the estimated in the registered PDD has been observed.

The GWP_{CH4} has been updated for the months of 2013 for the values presented at the registered PDD.

The increase has been proved to be due to a better methane capture rate (due to the extension of the gas collection system as landfilling progresses which was achieved by some improvements of the landfill operating practices performed during this period); methane destruction rate; and project emissions due to electricity

consumption. However, the increase is overall very subtle and cannot be attributable to any reason that could make think that the project is no more in compliance with the CDM rules.

5.14. Overall Aspects of the Verification

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installations of the plant which are relevant for the project performance and the monitoring activities.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the UNFCCC criteria and relevant guidance provided by the COP/CMP and the CDM EB (clarifications and/or guidance).

5.15. Hints for next periodic Verification

Not applicable.

6. VERIFICATION AND CERTIFICATION STATEMENT

Proactiva Meio Ambiente - Brasil has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 4th periodic verification of the project: *“Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project”*, with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to the installation of gas collection and flaring equipment in a landfill in order to capture and destroy the methane generated by the anaerobic digestion of solid waste, so that it would not be released to the atmosphere. This verification covers the period from 2011-12-01 to 2013-04-30 (including both days).

In the course of the verification, 02 Corrective Action Requests (CAR) and 01 Clarification Request (CL) were raised and successfully closed. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0001- ver. 5
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 4th periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **320,505** t CO_{2e}

São Paulo, 2014-05-15



Sergio Cruz

TÜV NORD JI/CDM Certification Program
Verification Team Leader

Essen, 2014-05-15



Alexandra Nebel

TÜV NORD JI/CDM Certification Program
Final Approval

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
/CAL/	<u>Calibration Certificates:</u> <ul style="list-style-type: none"> - Differential Pressure Transmitter Fuji Electric (Serial # A8B7518F/1QB5114) – Certificate # ONT-2072/11 – Calibration: 2011-05-23 – issued by OnTech Comércio e Serviços on 2011-05-24 – LFG_{flare1} - Differential Pressure Transmitter Fuji Electric (Serial # A8B7518F/1QB5114) – Certificate # ONT-2243/12 – Calibration: 2012-05-16 – issued by OnTech Comércio e Serviços on 2012-05-17 – LFG_{flare1} - Differential Pressure Transmitter Fuji Electric (Serial # A7F9524F/1LA1250) – Certificate # ONT-1932/10 – Calibration: 2011-05-23 – issued by OnTech Comércio e Serviços on 2011-05-24 – LFG_{flare2} - Differential Pressure Transmitter Fuji Electric (Serial # A7F9524F/1LA1250) – Certificate # ONT-2073/11 – Calibration: 2012-05-16 – issued by OnTech Comércio e Serviços on 2012-05-17 – LFG_{flare2} - Absolute Pressure Transmitter #1 Fuji Electric (Serial #A7F9668F/C282814) – Certificate # 4017/11 – Calibration: 2011-07-31 – issued by Certi Laboratório de Força, Pressão e Massa on 2011-08-08 – P₁ - Absolute Pressure Transmitter #1 Fuji Electric (Serial #A7F9668F/C282814) – Certificate # 3360/12 – Calibration: 2012-07-04 – issued by Certi Laboratório de Força, Pressão e Massa on 2012-07-05 – P₁ - Absolute Pressure Transmitter #2 Fuji Electric (Serial #A7F9667F/C282810) – Certificate # 3674/11 – Calibration: 2011-07-19 – issued by Certi Laboratório de Força, Pressão e Massa on 2011-07-20 – P₂ - Absolute Pressure Transmitter #2 Fuji Electric (Serial #A7F9667F/C282810) – Certificate # 3887/12 – Calibration: 2012-07-24 – issued by Certi Laboratório de Força, Pressão e Massa on 2012-08-02 – P₂ - Absolute Pressure Transmitter (Backup) Fuji Electric (Serial #A7F9668F/C282803) – Certificate # 2995/12 – Calibration: 2012-06-15 – issued by Certi Laboratório de Força, Pressão e Massa on 2012-06-21 –

Reference	Document
	<p>P₁ and 2</p> <ul style="list-style-type: none"> - Thermocouple Consistec - Type N (Serial # TC CR01107/11) – Certificate # CR-01107/11 Rev - 00 – Calibration: 2011-01-27 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-01-31 – T_{Flare1} – REPLACED - Thermocouple Consistec - Type N (Serial # TC CR12909/11) – Certificate # CR-12909/11 Rev - 00 – Calibration: 2011-12-12 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-12-14 – T_{Flare1} – REPLACED - Thermocouple Consistec - Type N (Serial # TC CR11189/12) – Certificate # CR-11189/12 Rev - 00 – Calibration: 2012-11-19 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2012-11-22 – T_{Flare1} - Thermocouple Consistec - Type N (Serial # TC CR01108/11) – Certificate # CR-01108/11 Rev - 00 – Calibration: 2011-01-27 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-01-31 – T_{Flare2} – REPLACED - Thermocouple Consistec - Type N (Serial # TC CR12908/11) – Certificate # CR-12908/11 Rev - 00 – Calibration: 2011-12-12 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-12-14 – T_{Flare2} – REPLACED on 2011-09-29 – REPLACED - Thermocouple Consistec - Type N (Serial # TC CR11190/12) – Certificate # CR-11190/12 Rev - 00 – Calibration: 2012-11-19 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2012-11-22 – T_{Flare2} - Temperature Transmitter #1 - Consistec - Model PT100 (Serial # PT100 – CR-01106/11) – Certificate # CR-01106/11 Rev - 00 – Calibration: 2011-01-28 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-01-31 – T₁ – REPLACED - Temperature Transmitter #1 - Consistec - Model PT100 (Serial # PT100 – CR-12910/11) – Certificate # CR-12910/11 Rev - 00 – Calibration: 2011-12-14 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-12-14 – T₁ – REPLACED - Temperature Transmitter #1 - Consistec - Model PT100 (Serial # PT100 – CR-11191/12) – Certificate # CR-11191/12 Rev - 00 – Calibration: 2012-11-14 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2012-11-22 – T₁ - Temperature Transmitter #2 - Consistec - Model PT100 (Serial # PT100 – CR-09923/11) – Certificate # CR-09923/11 Rev - 00 – Calibration: 2011-09-21 – issued by Consistec Controles de Sistemas de Automação Ltda. on 2011-09-23 – T₂ – REPLACED - Temperature Transmitter #2 - Consistec - Model PT100 (Serial # PT100 –

Reference	Document
	<p>LV34114-12) – Certificate # LV34114-12-R0 – Calibration: 2012-08-29 – issued by Visomes Comercial Metrológica Ltda. on 2012-08-29 – T₂</p> <ul style="list-style-type: none"> - Gas Analyzer Uras 26 # 33457308 – capacity: 0 - 100% CH₄ – Certificate # E0887/11 – Calibration: 2011-04-13 – issued by Elus Instrumentação on 2011-04-27 – W_{CH4} - Gas Analyzer Uras 26 # 33457318 – capacity: 0 - 3000 PPM CH₄ – Certificate # E0889/11 – Calibration: 2011-04-13 – issued by Elus Instrumentação on 2011-04-27 – W_{CH4} - Gas Analyzer Uras 26 # 33457308 – range: 0.....100 Vol% - CH₄ – Certificate # 02/2012 – Calibration: 2012-03-12 – issued by Asea Brown Boveri Ltda. (ABB) on 2012-03-12 – W_{CH4} - Gas Analyzer Uras 26 # 33457318 – range: 0.....3000 PPM - CH₄ – Certificate # 02/2012 – Calibration: 2012-03-12 – issued by Asea Brown Boveri Ltda. (ABB) on 2012-03-12 – W_{CH4} - Gas Analyzer Uras 26 # 33457308 – capacity: 0 - 100% CH₄ – Certificate # E0436/13 – Calibration: 2013-03-12 – issued by Elus Instrumentação on 2013-03-29 – W_{CH4} - Gas Analyzer Uras 26 # 33457318 – capacity: 0 - 3000 PPM CH₄ – Certificate # E0434/13 – Calibration: 2013-03-12 – issued by Elus Instrumentação on 2013-03-29 – W_{CH4} - Gas Analyzer Uras 26 # 33457308 – 0 - 100% CO₂ – Certificate # E0885/11 – Calibration: 2011-04-13 – issued by Elus Instrumentação on 2011-04-27 – f_{VCO2} - Gas Analyzer Uras 26 # 33457308 – range: 0.....100 Vol% - CO₂ – Certificate # 02/2012 – Calibration: 2012-03-12 – issued by Asea Brown Boveri Ltda. (ABB) on 2012-03-12 – f_{VCO2} - Gas Analyzer Uras 26 # 33457308 – capacity: 0 - 100% CO₂ – Certificate # E0437/13 – Calibration: 2013-03-12 – issued by Elus Instrumentação on 2013-03-29 – f_{VCO2} - Gas Analyzer Uras 26 # 33457308 – capacity: 0 - 25% O₂ – Certificate # E0888/11 – Calibration: 2011-04-13 – issued by Elus Instrumentação on 2011-04-27 – t_{O2} - Gas Analyzer Uras 26 # 33457318 – capacity: 0 - 25% O₂ – Certificate # E0890/11 – Calibration: 2011-04-13 – issued by Elus Instrumentação on 2011-04-27 – t_{O2} - Gas Analyzer Uras 26 # 33457308 – range: 0.....25 Vol% - O₂ – Certificate # 02/2012 – Calibration: 2012-03-12 – issued by Asea Brown Boveri Ltda. (ABB) on 2012-03-12 – t_{O2} - Gas Analyzer Uras 26 # 33457318 – range: 0.....25 Vol% - O₂ –

Reference	Document
	<p>Certificate # 02/2012 – Calibration: 2012-03-12 – issued by Asea Brown Boveri Ltda. (ABB) on 2012-03-12 – t_{O2}</p> <ul style="list-style-type: none"> - Gas Analyzer Uras 26 # 33457308 – capacity: 0 - 25% O₂ – Certificate # E0435/13 – Calibration: 2013-03-12 – issued by Elus Instrumentação on 2013-03-29 – t_{O2} - Gas Analyzer Uras 26 # 33457318 – capacity: 0 - 25% O₂ – Certificate # E0433/13 – Calibration: 2013-03-12 – issued by Elus Instrumentação on 2013-03-29 – t_{O2} - Electricity Import Meter Schneider Electric – Model Power Logic PM200MG (Serial # 38004935) – Certificate # 1360514/11 – calibration: 2011-03-24 – issued by Eletrobrás - Eletrosul on 2011-04-12 – EL_{IMP} - Electricity Import Meter Schneider Electric – Model Power Logic PM200MG (Serial # 38004935) – Certificate # 1169094/12 – calibration: 2012-02-16 – issued by Eletrobrás - Eletrosul on 2012-03-05 – EL_{IMP} - Electricity Import Meter Schneider Electric – Model Power Logic PM200MG (Serial # 38004935) – Certificate # 1504104/13 – calibration: 2013-04-16 – issued by Eletrobrás - Eletrosul on 2013-04-25 – EL_{IMP}
/CALport/	<p><u>Calibration Certificates of Portable Instrument:</u></p> <ul style="list-style-type: none"> - Portable Landfill Gas Analyzer GEM 2000 (Serial # GM11004) – Certificate # GM11004_5/1239 – Calibration: 2011-05-12 – issued by Landtec Produtos e Serviços Ambientais Ltda. - Portable Landfill Gas Analyzer GEM 2000 (Serial # GM11004) – Certificate # GM11004_5/1395 – Calibration: 2011-12-14 – issued by Landtec Produtos e Serviços Ambientais Ltda. - Portable Landfill Gas Analyzer GEM 2000 (Serial # GM11004) – Certificate # GM11004_5/1596 – Calibration: 2012-08-20 – issued by Landtec Produtos e Serviços Ambientais Ltda.
/COMP/	Comparison Performance over the 4 th MP – excel spreadsheet
/DOWN/	Print screen of data logger reports showing the downtimes of equipment
/LIC/	<ul style="list-style-type: none"> - Environmental License # 1020/2007 – issued by FATMA on 2007-12-12 – valid for 48 months - Request for renewal of the Environmental License # 176661 – FATMA –

Reference	Document
	<p>2011-08-11</p> <ul style="list-style-type: none"> - Inspection Report # 20/2013 – FATMA – 2013-03-19 - Operation License 2011 – issued by City Hall of Biguaçu on 2011-02-21 - Operation License 2012 – issued by City Hall of Biguaçu on 2012-02-03 - Operation License 2013 – issued by City Hall of Biguaçu on 2013-03-26
/MAIN/	<ul style="list-style-type: none"> - Manual of Description, Use and Maintenance – List of Equipment – A.08.R.004 – issued by GRS Valtech - Guidance on Landfill Gas Flaring – UK Environmental Agency - 5S Program – Audit Certificate – 2012-07-10 - Emergency Plan – PE-MASSQ-001 – rev. 02 – Proactiva Biguaçu Landfill – 2012-09-25 - Map of Environmental Risks – 2012/2013 - Organizational Chart - Preventive Maintenance Spreadsheet - Report of Daily Activities - Calibration Schedule Sheet - Report of Incidents
/MR/	<p>Monitoring Report “Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project” – Registration # 1506 – Monitoring Period #4 – 2011-12-01 to 2013-04-30 (both days included)</p> <ul style="list-style-type: none"> - version 1 – 2013-05-06 - version 2 – 2013-09-16 - version 3 – 2014-04-29
/TRAIN/	<p><u>Training:</u></p> <ul style="list-style-type: none"> - Operation and Maintenance of Landfill Gas Capture and Flaring Facility – Instructors: Yoann Ogor and Nicolas D’Adamo (GRS Valtech) – Certificated: Vincent Rebillard, Miguel Ramos Filho and Charles Tomazoni (former employee) – Date: 2008-10- 28 to 2008-10- 30 - CDM Concepts for Operation and Monitoring of Landfill Gas Capture and Flaring Facility – Instructor: Daniel Bidon (Proactiva Meio Ambiente) – Certificated: Vincent Rebillard – Date: 2008-10-31



Reference	Document
	<ul style="list-style-type: none"> - Concepts for Operation, Calibration and Maintenance of a Network of Forced Extraction of Landfill Gas – Instructor: Daniel Bidon (Proactiva Meio Ambiente) – Certificated: Vincent Rebillard, Miguel Ramos Filho and Charles Tomazoni (former employee) – Date: 2008-11-03 - Operation and Maintenance of Landfill Gas Capture and Flaring Facility – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Luiz Renato Leal de Meirelles (former employee) – Date: 2010-04-15 - Concepts for Operation, Calibration and Maintenance of a Network of Forced Extraction of Landfill Gas – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Luiz Renato Leal de Meirelles (former employee) – Date: 2010-04-15 - Operation and Maintenance of Landfill Gas Capture and Flaring Facility – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Maicon Luiz da Silva (former employee) – Date: 2010-10-06 - Concepts for Operation, Calibration and Maintenance of a Network of Forced Extraction of Landfill Gas – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Maicon Luiz da Silva (former employee) – Date: 2010-10-06 - Operation and Maintenance of Landfill Gas Capture and Flaring Facility – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Marcelo Utyama (former employee) – Date: 2011-01-19 - Concepts for Operation, Balancing and Maintenance of a Landfill Gas Collection Network – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Marcelo Utyama (former employee) – Date: 2011-01-19 - Operation and Maintenance of HDPE Pipe Fittings Fusion Equipment – Instructor: Fabiano Souza (Mc Fluid Equipamentos Industriais Ltda.) – Trained personnel: Marcelo Utyama, Miguel Ramos Filho and Maicon Luiz da Silva (former employee) – Date: 2011-02-24 and 25 - CDM Concepts for Operation and Monitoring of Landfill Gas Capture and Flaring Facility – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Marcelo Utyama (former employee) – Date: 2011-04-12 - Operation and Maintenance of Landfill Gas Capture and Flaring Facility – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Amilton Adriano – Date: 2012-08-30 - Concepts for Operation, Balancing and Maintenance of a Landfill Gas Collection Network – Instructor: Vincent Rebillard (Proactiva Meio

Reference	Document
	<p>Ambiente Brasil) – Internal Course – Certificated: Amilton Adriano – Date: 2012-08-30</p> <ul style="list-style-type: none"> - Operation and Maintenance of Landfill Gas Capture and Flaring Facility – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Leandro G. Guedes – Date: 2013-03-27 - Concepts for Operation, Balancing and Maintenance of a Landfill Gas Collection Network – Instructor: Vincent Rebillard (Proactiva Meio Ambiente Brasil) – Internal Course – Certificated: Leandro G. Guedes – Date: 2013-03-27
/XLS/	Excel spreadsheets
/WWR/	Waste Weighbridge Report – 2006-2013 (until Apr 2013)

Table 7-2: Background investigation and assessment documents

Reference	Document
/ACM0001/	ACM0001- ver. 5, “Consolidated baseline and monitoring methodology for landfill gas project activities”
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/GLMP/	Guidelines: Completing the monitoring report form (EB 75, Annex 7)
/IPCC/	<ol style="list-style-type: none"> 1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/MRT/	Monitoring Report Form (F-CDM-MR), Version 03.1

Reference	Document
/MT/	<p><u>Methodological Tools:</u></p> <ul style="list-style-type: none"> - Tool to calculate baseline, project and/or leakage emissions from electricity consumption – version 01 - Tool to calculate project or leakage CO2 emissions from fossil fuel combustion – version 02 - Tool to calculate the emission factor for an electricity system – version 02 - Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site – version 05 - Tool to determine project emissions from flaring gases containing methane
/PDD/	Project Design Document for CDM project: “Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project” – version 4.3 – Date: July 2011
/PS/	CDM Project Standard (Version 5.0)
/USEPA/	Landfill Gas Modeling – United States Environmental Protection Agency
/VAL/	Validation Report for CDM project “Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project in Brazil” – issued by DNV, version 03.A – 2007-12-04
/VER/	<ul style="list-style-type: none"> - Verification Report for CDM project “Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project in Brazil” – 1st Periodic – issued by TÜV Nord # 7371 – 10/278 – 2011-05-20 - Verification Report for CDM project “Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project in Brazil” – 2nd Periodic – issued by TÜV Nord # 7894 – 11/212 – 2012-09-18 - Verification Report for CDM project “Proactiva Tijuquinhas Landfill Gas Capture and Flaring Project in Brazil” – 3rd Periodic – issued by TÜV Nord # 8571 – 11/664 – 2013-01-21
/VVS/	CDM Validation and Verification Standard (Version 05.0)

Table 7-3: Websites used

Reference	Link	Organization
/dna/	http://www.mct.gov.br	DNA of Brazil
/ereport/	http://www.ereport-onyx.com/neoconsolidation/Default.asp	Environmental Reporting Tool – Veolia Environmental Service
/fatma/	http://www.fatma.sc.gov.br/	Environmental Foundation of the State of Santa Catarina
/ibama/	http://www.ibama.gov.br/	Brazilian Institute for the Environment
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/pp/	http://www.proactiva.com.br/	Proactiva Meio Ambiente Brasil
	http://www.proactiva.es/es/index.php	Proactiva Medio Ambiente
	http://www.veolia-proprete.com/	Veolia Propreté
/unfccc/	http://cdm.unfccc.int	UNFCCC
/usepa/	http://www.epa.gov/	United States Environmental Protection Agency

Table 7-4: List of interviewed persons

Reference	Mol ¹		Name	Organization / Function
/IM01/	V	<input checked="" type="checkbox"/> Mr.	Vincent Rebillard	Proactiva Brasil / CDM Project



Reference	Mol ¹		Name	Organization / Function
		<input type="checkbox"/> Ms.		Manager
/IM01/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Natalie Figueiredo	Proactiva Brasil / CDM Project Manager Assistant
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Miguel Ramos Filho	Proactiva Brasil / Landfill Gas Technician

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)

ANNEX

- A1:** Verification Protocol
- A2:** Statements of Competence of involved Personnel

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
Raw data generation				
<ul style="list-style-type: none"> • Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy • Change of technology 	<ul style="list-style-type: none"> • Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspections of installed equipment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment • Stand-by duty is 	<ul style="list-style-type: none"> • Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures • Insufficient accuracy • Inappropriate QA/QC 	<ul style="list-style-type: none"> • Site – visit • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-check of raw data and commercial data • Check of CDM management system • Check of CDM related procedures 	<ul style="list-style-type: none"> • See Table A-2

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
<ul style="list-style-type: none"> Accuracy of values supplied by Third Parties 	<ul style="list-style-type: none"> organized Training Internal audit procedures Internal check of QA/QC measures of involved Third Parties 	<ul style="list-style-type: none"> measures of Third Parties 	<ul style="list-style-type: none"> Application of CDM management system procedures Check of trainings Check of responsibilities Check of QA/QC documentation / evidences of involved Third Parties 	
Raw data collection and data aggregation				
<ul style="list-style-type: none"> Wrong data transfer from raw data to daily and monthly aggregated reporting forms IT Systems Spread sheet programming Manual data transmission Data protection Responsibilities 	<ul style="list-style-type: none"> Cross-check of data Plausibility checks of various parameters. Appropriate archiving system Clear allocation of responsibilities Application of CDM Management system procedures Usage of standard software solutions 	<ul style="list-style-type: none"> Unintended usage of old data that has been revised Incomplete documentation Ex-post corrections of records Ambiguous sources of information Non-application of management system procedures Manual data transfer mistakes 	<ul style="list-style-type: none"> Check of data aggregation steps Counter-calculation Data integrity checks by means of graphical data analysis and calculation of specific performance figures Check of management system certification Check of data archiving system 	<ul style="list-style-type: none"> See Table A-2

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
	(Spreadsheets) <ul style="list-style-type: none"> Limited access to IT systems Data protection procedures 	<ul style="list-style-type: none"> Unintended change of spread sheet programming or data base entries Problems caused by updating/upgrading or change of applied software 	<ul style="list-style-type: none"> Check of application of Management system procedures 	
Other calculation parameters				
<ul style="list-style-type: none"> Emission factors, oxidation factors, coefficients 	<ul style="list-style-type: none"> The values and data sources applied are defined in the PDD and monitoring plan 	<ul style="list-style-type: none"> Unintended or intended Modification of calculation parameters Wrong application of values Misinterpretations of the applied methodology and/ or the PDD Missing update of applicable regulatory framework (e.g. IPCC values) 	<ul style="list-style-type: none"> Update-check of regulatory framework Countercheck of the applied MP in the MR against the methodology and the PDD 	<ul style="list-style-type: none"> See Table A-2
Calculation Methods				

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
<ul style="list-style-type: none"> Applied formulae Miscalculation Mistakes in spread-sheet calculation 	<ul style="list-style-type: none"> Advanced calculation and reporting tools A CDM coordinator is in charge of the CDM related calculations Usage of tested / counterchecked Excel spreadsheets Involvement of external consultants 	<ul style="list-style-type: none"> The danger of miscalculation can only be minimized. 	<ul style="list-style-type: none"> Countercheck on the basis of own calculation. Spread sheet walk-through. Plausibility checks Check of plots 	<ul style="list-style-type: none"> See Table A-2
Monitoring reporting				
<ul style="list-style-type: none"> Data transfer to the author of the monitoring report Data transfer to the monitoring report Unintended use of outdated versions 	<ul style="list-style-type: none"> An experienced CDM consultant is responsible for monitoring reporting. CDM QMS procedures are defined 	<ul style="list-style-type: none"> The danger of data transfer mistakes can only be minimized Inappropriate application of QMS procedures 	<ul style="list-style-type: none"> Counter check with evidences provided. Audit of procedure application 	<ul style="list-style-type: none"> See Table A-2

Table A-2: (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A. Description of the project activity				
A.1. Purpose and general description of the project activity (EB 75, Annex 7, A.1) <i>Check if section A.1 of the MR includes the following:</i> <ul style="list-style-type: none"> - Purpose of the PA and the measures taken to reduce GHG emissions - Brief description of the installed technology and equipment - Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc.) - Total emission reductions achieved in this monitoring period 	/MR/	<p>The verification team has checked section A.1 of the MR and confirms that the information provided is complete and correct with regards to the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Purpose of the PA and the measures taken to reduce GHG emissions <input checked="" type="checkbox"/> Brief description of the installed technology and equipment <input checked="" type="checkbox"/> Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc.) <input checked="" type="checkbox"/> Total emission reductions achieved in this monitoring period <p>In this context the following findings have been identified: N/A</p>	OK	OK
A.2. Location of project activity (EB 75, Annex 7, A.2) <i>Check if section A.2 of the MR reflects correctly the following:</i> <ul style="list-style-type: none"> - Host Party(ies) - Region / State / Province etc. - City / Town / Community etc. 	/MR/ /PDD/ /IM01/	<p>The verification team has checked section A.2 of the MR and confirms by means of comparison with the information given in the PDD and information gathered during the site visit that the information provided is complete and correct with regards to the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Host Party(ies) <input checked="" type="checkbox"/> Region / State / Province <input checked="" type="checkbox"/> City / Town / Community 	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
- <i>Physical / geographical location (e.g. Latitude and Longitude)</i>		<input checked="" type="checkbox"/> Physical / Geographical location In this context the following findings have been identified: N/A		
A.3. Parties and Project Participants (EB 75, Annex 7, A.3) Check if section A.3 of the MR includes the following: <ul style="list-style-type: none"> - All PPs as displayed on the UNFCCC website - A correctly filled table as per the MR template 	/MR/ /unfccc/	The verification team has checked section A.3 of the MR as well as the UNFCCC website and confirms that: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> all PPs as displayed on the project related UNFCCC website are correctly listed <input checked="" type="checkbox"/> the table as per the template MR has been correctly filled In this context the following findings have been identified: N/A	OK	OK
A.4. Reference of applied methodology (EB 75, Annex 7, A.4) Check if section A.4 of the MR correctly describes / includes the following: <ul style="list-style-type: none"> - Reference to the applicable version of the methodology - Reference to the applicable version(s) of relevant methodological tools - Relevant EB decisions, if applicable 	/MR/ /PDD/ /unfccc/	The verification team has checked section A.4 of the MR and confirms by means of comparison with the information given in the PDD and displayed on the UNFCCC website that the information provided is complete and correct with regards to the following: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Number, title and version of the applicable CDM Methodology <input checked="" type="checkbox"/> Name and version of applicable CDM methodological tools <input checked="" type="checkbox"/> Relevant EB decisions In this context the following findings have been identified: N/A	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A.5. Crediting period of project activity (EB 75, Annex 7, A.5) <i>Check if section A.5 of the MR correctly includes the following:</i> <ul style="list-style-type: none"> - <i>Start date of the crediting period. In this context please check, if applicable, whether post registration changes to the start date have been accepted by the EB.</i> - <i>Length and type of the crediting period</i> 	/MR/ /unfccc/	<p>The verification team has checked section A.5 of the MR and confirms by means of comparison with the information displayed on the UNFCCC website that the information provided is complete and correct with regards to the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Start date of the crediting period. <input checked="" type="checkbox"/> Type and length of the crediting period <p>In this context the following findings have been identified: N/A</p>	OK	OK
A.6. Publication of the Monitoring Report (VVS, § 207) <i>Check if the monitoring report has been made publicly available on the UNFCCC website before the verification commenced.</i> <i>Check if comments have been received and if yes, how they have been addressed.</i>	/unfccc/	<p>The verification team has ensured and confirms by means of checking the respective project information on the UNFCCC website that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> The draft monitoring report, as received from the project participants, has been made publicly available prior to the start of the verification activities. <input checked="" type="checkbox"/> No comments have been received. <p>In this context the following findings have been identified: N/A</p>	OK	OK
A.7. Compliance with standardized format of the Monitoring Report (VVS, § 212 e)	/MRT/	<p>The verification team has checked all sections of the MR and confirms by means of comparison with the MR template that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the standardized MR template has been used 	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Check (only) if the latest applicable MR template has been used. For compliance assessment with the MR guideline pl. refer to the respective MR sections.</i>		In this context the following findings have been identified: N/A		
B. Implementation of project activity				
B.1. Description of implemented registered project activity (EB 75, Annex 7, B.1) <i>Check if section B.1 of the MR correctly describes / includes the following:</i> <ul style="list-style-type: none"> - Implementation status of the PA - Detailed description of installed technology(ies) / technical processes and equipment applied - Diagrams (where appropriate) 	/MR/ /PDD/ /PS/ /IM01/	<p>The verification team has checked section B.1 of the MR and confirms by means of comparison with the information given in the PDD, the project standard and information gathered during the site visit that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the description of the implementation status of the PA is in line with the applicable provisions of the project standard <input checked="" type="checkbox"/> an appropriate description of the installed technology(ies), technical process and equipment incl. diagrams, where applicable, has been included <p>In this context the following findings have been identified: N/A</p>	OK	OK
B.1.1. Initial project implementation (VVS; § 225 a, 226) <i>Assess whether the project has been implemented and operated as per the registered PDD and are all physical features of the project in place?</i> <i>Further focus on the potential phase wise implementation and check the reporting on the corresponding status and starting dates accordingly.</i> <i>Check if the project is still in compliance with the</i>	/IM01/ /PDD/	<p><i>Description:</i> At the registered PDD it is stated the technical features and equipment to be employed by the project activity and what was verified by the verification team is that the project is indeed implemented with them. Horizontal and vertical piping system has been installed to collect the landfill gas. Drains and a pumping system have been implemented to collect drainage substances and the leachate, which optimizes the collection of gases. A network of pipes continues being installed throughout the landfill to bring gas to the flare system and the leachate to the treatment plant.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>applicability conditions of the methodology.</i></p> <p><i>Also, discuss – if applicable – the necessity of PRC notifications / approvals.</i></p>		<p>Two enclosed flare units and blowers have been installed and are responsible for the destruction of the landfill gas. In addition, a diesel generator group has been installed in the biogas plant.</p> <p><i>Verifier's action:</i> During the site visit, the verification team had a full overview of all installation, equipment and operation of the landfill.</p> <p><i>Conclusion:</i> The project has been implemented and it is operating as per the registered PDD.</p>		
<p>B.1.2. Technical equipment changes (VVS; § 225 a, 226)</p> <p><i>Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period. Further ensure that consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied</i></p> <p><i>Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.</i></p> <p><i>In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.</i></p> <p><i>In case of post registration changes pl. refer to</i></p>	<p>/IM01/ /MR/ /CAL/ /MAIN/</p>	<p><i>Description:</i> At the registered PDD it is stated the technical features and equipment to be employed by the project activity and what was verified by the verification team is that the project is indeed implemented with them.</p> <p>Horizontal and vertical piping system has been installed to collect the landfill gas. Drains and a pumping system have been implemented to collect drainage substances and the leachate, which optimizes the collection of gases.</p> <p>A network of pipes is installed throughout the landfill to bring gas to the flare system and the leachate to the treatment plant.</p> <p>Two enclosed flare units and blowers have been installed and are responsible for the destruction of the landfill gas.</p> <p>A diesel generator group has also been installed in the biogas plant and this has been notified to the UNFCCC.</p> <p>The landfill is divided as follows:</p>	CAR B+	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>chapter B.2.</i>		<ul style="list-style-type: none"> a. Zone 1 has received waste between 1991 and 2004. The gas collection system (9 horizontal drains interconnected with existing wells) was installed in 2008. b. Zone 2 has received waste between 2004 and 2007. The gas collection system (10 horizontal drains interconnected with 24 vertical wells and 6 additional vertical wells directly connected to the main carriers) was installed in 2008. c. Zone 3-A has received waste between 2007 and 2009. The gas collection system installation began in 2008. Extensions were provided as landfilling progressed until final elevation was reached at the end of 2009. The initial gas collection system was composed by 14 horizontal drains interconnected with 33 vertical wells. It was completed by 2 horizontal drains (November 2012) to increase the collection efficiency. d. Zone 3-B has received waste between January 2010 and May 2012. The gas collection system installation started on 2010 and it was completed in October 2012 to improve the collection efficiency. e. Zone 3-C: start receiving waste on May 2012 and it is the current disposal area. The existing vertical wells of Zones 3-A and 3-B were extended up to Zone 3-C. 7 horizontal drains interconnected with 		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>the vertical wells were installed and put in operation in order to collect gas in the new disposal areas.</p> <p>Thus, the landfill gas network has been installed from 2008 and continues to be implemented. In addition, the thickness of the temporary soil cover was increased from 30 to 40 cm on the landfill main platform in order to reduce landfill gas fugitive emissions.</p> <p>The new implementations are also in accordance with the registered PDD as the purpose of the project activity is to improve the gas collection and leachate collection and treatment.</p> <p>For this monitoring period, just the temperature transmitters and the thermocouples for both Flare 1 and Flare 2 have been exchanged in compliance with the regular exchange and calibration schedule of the plant. Nevertheless, as this was not reported at the MR, CAR B1 was raised.</p> <p><i>Verifier's action:</i> During the site visit, the verification team had a full overview of all installation, equipment and operation of the landfill.</p> <p><i>Conclusion:</i> The project activity continues in line with the registered PDD. These changes have been considered in the monitoring report and the emission reduction</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>calculation. As the equipment exchanges were not reported at the MR, a CAR was raised.</p> <p>(CAR B1) At Section B.1, it is missing:</p> <p>a. events that cause downtimes and interruption of the activity with respective actions taken;</p> <p>equipment exchanges.</p>		
<p>B.1.3. Operation of the project activity (VVS; § 225 a, 226)</p> <p><i>Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.</i></p> <p><i>Consider e.g. interviews with operational personnel, operation log sheets, data management system records.</i></p> <p><i>In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.</i></p> <p><i>In case of post registration changes pl. refer to chapter B.2.</i></p>	/IM01/ /PDD/	<p><i>Description:</i> The mode of operation for the project activity had no modification for this monitoring period.</p> <p><i>Verifier's action:</i> During the site visit, the verification team has interviewed the operation personnel and reviewed log sheets and data management records.</p> <p><i>Conclusion:</i> The project activity is in line with the registered PDD.</p>	OK	OK
<p>B.1.4. Incidents (VVS; § 225 a, 226)</p> <p><i>Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the</i></p>	/IM01/ /MAIN/	<p><i>Description:</i> Several downtimes occurred during the monitoring period due to power failures from the grid supply, equipment problems and maintenance and the actions taken are reflected at the ER calculations.</p> <p>Nevertheless, as they are not described in the MR, CAR</p>	CAR B1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>equipment?</i></p> <p><i>Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.</i></p>		<p>B1 was raised.</p> <p><i>Verifier's action:</i> The verification team has verified the Report of Incidents^{/MAIN/} and confirmed the information by interviewing operational personnel and cross-checking against operational raw data records for the moments of incidents.</p> <p><i>Conclusion:</i> Refer to CAR B1 above at B.1.2.</p>		
<p>B.1.5. Legislation</p> <p>Find out – esp. in the context of methodological requirements - whether relevant legislation with effect on the project activity in the host country has been changed.</p> <p>Assess, in case of changes, whether consequences for the PA with regard to relevant CDM requirements have been accounted for.</p> <p>In case of changes data sources shall be referenced.</p>	<p>/IM01/ /OL/ /fatma/ /ibama/</p>	<p><i>Description:</i> No relevant legislation from host country affecting the operations of the project activity has been changed.</p> <p><i>Verifier's action:</i> The verification team has reviewed the operational license and relevant legislation related to the project activity.</p> <p><i>Conclusion:</i> No changes have occurred.</p>	OK	OK
<p>B.1.6. Open issues from validation (VVS; § 213)</p> <p><i>Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?</i></p>	/VAL/	<p><input checked="" type="checkbox"/> There were no open issues addressed in the validation report</p> <p><input type="checkbox"/> All open issues from the validation have been appropriately addressed.</p> <p><input type="checkbox"/> The following issues related to the validation have not yet been appropriately addressed:</p>	OK	OK
B.1.7. Open issues from previous	/VER/	<input type="checkbox"/> There were no open issues addressed in the previous	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.									
verification (VVS; §§ 213; 284 h) <i>Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR) and take into consideration the guidance as specified in VVS.</i>		verification report <input checked="" type="checkbox"/> All open issues from the previous verification have been appropriately addressed. <input type="checkbox"/> The following issues related to the previous verification have not yet been appropriately addressed:											
B.2. Post registration changes													
B.2.1. Are post registration changes applicable to the proposed project activity?	/MR/ /PDD/ /unfccc/	<input type="checkbox"/> No, by means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PDD and the applied methodology. (Please proceed with section C) <input checked="" type="checkbox"/> Yes, post registration changes have been identified and are assessed in detail in the subsequent steps. (Please proceed with B.2.2.)	OK	OK									
B.2.2. Temporary deviations from the registered monitoring plan or applied methodology (TDfrMP; TDfMM) (EB 75, Annex 7, B.2.1; VVS §§ 251 - 256) <i>Indicate whether any temporary deviations have been applied during this monitoring period. In cases where approval has been sought from the EB please provide reference.</i>		<table><tr><td><input type="checkbox"/></td><td colspan="2">No TDfrMP or TDfMM has been submitted to the UNFCCC prior to the current monitoring period</td></tr><tr><td><input checked="" type="checkbox"/></td><td colspan="2">The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC</td></tr><tr><td>1</td><td>Title</td><td>The parameter “Total amount of electricity imported to meet project requirement” has not been archived electronically monthly as stated in the</td></tr></table>	<input type="checkbox"/>	No TDfrMP or TDfMM has been submitted to the UNFCCC prior to the current monitoring period		<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		1	Title	The parameter “Total amount of electricity imported to meet project requirement” has not been archived electronically monthly as stated in the	/MR/ /PDD/ /PS/ /unfccc/	
<input type="checkbox"/>	No TDfrMP or TDfMM has been submitted to the UNFCCC prior to the current monitoring period												
<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC												
1	Title	The parameter “Total amount of electricity imported to meet project requirement” has not been archived electronically monthly as stated in the											

Checklist Item (incl. guidance for the verification team)	Refe- rence	Verification Team Comments (Means and results of assessment)				Draft Concl.	Final Concl.			
<i>If applied, provide a description of the deviation(s). This should include the reasons for the deviation(s), how it deviates from the monitoring plan and/or applied methodology(ies), the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach. Indicate if the deviation will lead to a reduction in the accuracy and if so, which conservative assumptions and discount factors have been applied.</i> <i>For deviation(s) that require prior approval by the Board, include the date of approval and reference number.</i>				MP of the registered PDD. Electricity import is however continuously measured by an electricity meter and the equipment keeps the data of the accumulated electricity.						
			Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved						
			Appr.date	2011-05-03						
			Ref. No.	I-DEV0404						
		2	Title	The parameter ‘Temperature in the exhaust gas of the flare’ (T _{flare}) has not been monitored in the <u>exhaust gas</u> of the flare in the current monitoring period.						
			Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved						
			Appr.date	2012-08-28						
			Ref. No.	PRC-1506-001						
		<input type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA							
		<input type="checkbox"/>	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.							
		1	Issue:							
		2	Issue:							

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.									
		<table><tr><td rowspan="3"><input type="checkbox"/></td><td colspan="2">The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:</td></tr><tr><td>1</td><td>Issue:</td><td></td></tr><tr><td>2</td><td>Issue:</td><td></td></tr></table> <p><i>In cases of approved TDfrMP or TDfM the EB guidance has been applied as follows: a request for temporary post-registration changes to the CDM project activity PRC-1506-001 has been submitted to the EB and approved on 2012-08-29. The request was necessary because instead of monitoring the flare temperature at 80% of total height, it has been observed that the parameter T_{flare} was being monitored right above the combustion zone (lower part) of the flare. The incorrect procedure has been performed from 2010-09-01 until 2012-01-07 (both days included). The procedure has been revised and from 2012-01-07 onwards, the procedure is in accordance with the registered monitoring plan.</i></p> <p><i>Detailed description and justification each TDfrMP or TDfM for which appendix 1 is applicable: as per the approved request for temporary deviation, a minimum temperature of 780°C must be guaranteed for the monitored flare temperature (combustion zone) in order to claim emission reductions. Therefore, from 2011-12-01 to 2012-01-07 (both days included), the emission reductions were calculated taking</i></p>	<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		1	Issue:		2	Issue:			
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:												
	1	Issue:											
	2	Issue:											

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.												
		<p>into account such requirement on flare temperature. It does result in a decrease of 42 tCO₂e from the total emission reductions claimed over the 4th monitoring period. From 2012-01-07 onwards, the flare temperature was monitored at 80% of total flare height as per the applicable Tool and a minimum temperature of 500°C (default value of the tool) was considered to calculate emission reductions.</p> <p>In this context the following findings have been identified: N/A</p>														
<p>B.2.3. Corrections (EB 75, Annex 7, B.2.2; VVS; §§ 257 - 259)</p> <p><i>Indicate whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.</i></p> <p><i>In cases where the correction(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.</i></p> <p><i>Please check and report that the corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and</i></p>	<p>/MR/ /PDD/</p>	<table><tr><td><input type="checkbox"/></td><td colspan="3">The following corrections have been applied:</td></tr><tr><td>1</td><td>Issue:</td><td colspan="2"></td></tr><tr><td>2</td><td>Issue:</td><td colspan="2"></td></tr></table> <p><i>Detailed description and justification each correction:</i></p> <p>In this context the following findings have been identified: N/A</p>	<input type="checkbox"/>	The following corrections have been applied:			1	Issue:			2	Issue:			<p>N/A</p>	<p>N/A</p>
<input type="checkbox"/>	The following corrections have been applied:															
1	Issue:															
2	Issue:															

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																																														
the monitoring plan.																																																		
<div>B.2.4. Permanent changes from the registered monitoring plan or applied methodology (PCfrMP; PCfMM) (EB 75, Annex 7, B.2.3; VVS; §§ 262 - 268) <i>Indicate whether any permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report.</i> <i>In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.</i></div>		<table><tr><td><input type="checkbox"/></td><td colspan="3">No PCfrMP or PCfMM has been submitted to the UNFCCC prior to the current monitoring period</td></tr><tr><td><input type="checkbox"/></td><td colspan="3">The following PCfrMP or PCfMM have been approved or are under approval by the UNFCCC</td></tr><tr><td rowspan="4">1</td><td>Title</td><td colspan="2"></td></tr><tr><td>Status</td><td colspan="2"><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td></tr><tr><td>Appr.date</td><td colspan="2"></td></tr><tr><td>Ref. No.</td><td colspan="2"></td></tr><tr><td rowspan="4">2</td><td>Title</td><td colspan="2"></td></tr><tr><td>Status</td><td colspan="2"><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td></tr><tr><td>Appr.date</td><td colspan="2"></td></tr><tr><td>.</td><td colspan="2"></td></tr><tr><td><input type="checkbox"/></td><td colspan="3">During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA</td></tr><tr><td><input type="checkbox"/></td><td colspan="3">An approval of the following PCfrMP or PCfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.</td></tr><tr><td>1</td><td>Issue:</td><td colspan="2"></td></tr></table>	<input type="checkbox"/>	No PCfrMP or PCfMM has been submitted to the UNFCCC prior to the current monitoring period			<input type="checkbox"/>	The following PCfrMP or PCfMM have been approved or are under approval by the UNFCCC			1	Title			Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved		Appr.date			Ref. No.			2	Title			Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved		Appr.date			.			<input type="checkbox"/>	During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA			<input type="checkbox"/>	An approval of the following PCfrMP or PCfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.			1	Issue:			N/A	N/A
<input type="checkbox"/>	No PCfrMP or PCfMM has been submitted to the UNFCCC prior to the current monitoring period																																																	
<input type="checkbox"/>	The following PCfrMP or PCfMM have been approved or are under approval by the UNFCCC																																																	
1	Title																																																	
	Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved																																																
	Appr.date																																																	
	Ref. No.																																																	
2	Title																																																	
	Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved																																																
	Appr.date																																																	
	.																																																	
<input type="checkbox"/>	During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA																																																	
<input type="checkbox"/>	An approval of the following PCfrMP or PCfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.																																																	
1	Issue:																																																	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)				Draft Concl.	Final Concl.														
		<table><tr><td></td><td>2</td><td>Issue:</td><td></td></tr><tr><td rowspan="3"><input type="checkbox"/></td><td colspan="3">The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied:</td></tr><tr><td>1</td><td>Issue:</td><td></td></tr><tr><td>2</td><td>Issue:</td><td></td></tr></table>					2	Issue:		<input type="checkbox"/>	The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied:			1	Issue:		2	Issue:			
			2	Issue:																	
		<input type="checkbox"/>	The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied:																		
			1	Issue:																	
			2	Issue:																	
<i>In cases of approved PCfrMP or PCfMM the EB guidance has been applied as follows:</i>																					
<i>Detailed description and justification each TDfrMP or TDfMM for which appendix 1 is applicable:</i>																					
In this context the following findings have been identified: N/A																					
B.2.5. Changes to the project design of the registered project activity (CoPD) <i>(EB 75, Annex 7, B.2.4; VVS; §§ 269 - 282)</i> <i>Indicate whether any changes to the project design of</i>	/MR/ /PDD/	<table><tr><td><input type="checkbox"/></td><td colspan="3">No CoPD has been submitted to the UNFCCC prior to the current monitoring period</td></tr><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The following CoPD has been approved or are under approval by the UNFCCC</td></tr></table>				<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period			<input checked="" type="checkbox"/>	The following CoPD has been approved or are under approval by the UNFCCC			OK	OK						
<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period																				
<input checked="" type="checkbox"/>	The following CoPD has been approved or are under approval by the UNFCCC																				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)				Draft Concl.	Final Concl.			
<i>the project activity have been approved during this monitoring period or submitted with this monitoring report.</i> <i>In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.</i>			1	Title	Installation of a diesel generator group dedicated to the CDM project; and increase of the figures for waste input annual growth rate, maximum capture rate of phases 1 and 2 and project electricity consumption.					
				Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved					
				Appr.date	2011-08-24					
				Ref. No.	-					
			2	Title						
				Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved					
				Appr.date						
				.						
		<input checked="" type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA							
		<input type="checkbox"/>	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.							
			1	Issue:						
			2	Issue:						
		<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:							

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.								
		<table><tr><td></td><td>1</td><td>Issue:</td><td></td></tr><tr><td></td><td>2</td><td>Issue:</td><td></td></tr></table> <p><i>In cases of approved CoPD the EB guidance has been applied as follows:</i></p> <p><i>Detailed description and justification each CoPD for which appendix 1 of the CDM Project Standard is applicable:</i></p> <p>In this context the following findings have been identified: N/A</p>		1	Issue:			2	Issue:			
	1	Issue:										
	2	Issue:										
C. Description of monitoring system												
<p>C.1. Monitoring Plan – PDD Compliance (VVS, §§ 233-236)</p> <p><i>Check if the monitoring plan is in accordance with the monitoring plan contained in the registered PDD (or any accepted revised MP).</i></p> <p><i>Please check esp. if</i></p> <ul style="list-style-type: none"><i>all parameters stated in the MP of the registered PDD have been monitored and updated as</i>	/MR/ /PDD/	<p>By means of comparison of the MR with the registered PDD (or any revisions thereof), the verification team has checked whether the MP is in compliance with the registered PDD. The outcome is as follows:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>The MP is completely in accordance with the last registered/approved version of the PDD / MP.</td></tr></table> <p>In this context the following findings have been identified:</p>	<input checked="" type="checkbox"/>	The MP is completely in accordance with the last registered/approved version of the PDD / MP.	OK	OK						
<input checked="" type="checkbox"/>	The MP is completely in accordance with the last registered/approved version of the PDD / MP.											

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																		
<i>applicable</i> - <i>the monitoring equipment has been controlled and calibrated as per the MP</i> - <i>the monitoring results are consistently recorded as per the approved frequency</i> - <i>QA/QC procedures have been applied in accordance with the MP</i>		N/A																				
C.2. Monitoring Plan – Meth Compliance (VVS, §§ 229-232) <i>Check if the monitoring plan is in accordance with the applied methodology.</i> <i>In case the methodology references applicable tools it has to be ensured that the MP is also compliant with those tools.</i> <i>Also please specify if monitoring aspects have been identified that are not specified in the methodology but may enhance the level of accuracy and completeness of the monitoring plan – this esp. applies for SSC PAs.</i>	/MR/ /PDD/ /ACM01/	<div>By means of comparison of the MR with the applied CDM methodology and related tools the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology. The outcome is as follows:</div> <table><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)</td></tr><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows:</td></tr><tr><td rowspan="3">1</td><td>Title (of the tool)</td><td colspan="2">Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion</td></tr><tr><td>Version</td><td colspan="2">2</td></tr><tr><td>MP compliance</td><td colspan="2"><input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)</td></tr></table>	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)			<input checked="" type="checkbox"/>	The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows:			1	Title (of the tool)	Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion		Version	2		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)		OK	OK
<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)																					
<input checked="" type="checkbox"/>	The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows:																					
1	Title (of the tool)	Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion																				
	Version	2																				
	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)																				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)				Draft Concl.	Final Concl.	
			2	Title (of the tool)	Tool to calculate baseline, project and/or leakage emissions from electricity consumption			
				Version	1			
				MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)			
			3	Title (of the tool)	Combined tool to identify the baseline scenario and demonstrate additionality			
				Version	2.1			
				MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)			
		In this context the following findings have been identified:						
		Regarding aspects that are not specified in the methodology the following issues have been identified which may enhance the level of accuracy and completeness of the MP:						
		N/A						
		C.3. Management System (VVS, § 217 (a) (iii))	/IM01/	Description: Although the GHG data monitoring system is not embedded in a certified quality management system, a CDM Department has been implemented and a robust				OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Check if the GHG data monitoring system can be assessed as appropriate.</i></p> <p><i>In case reference is made to a (certified) company quality management system, check if all CDM related monitoring procedures have been fully integrated in the project participant's quality management system.</i></p> <p><i>In case of a stand-alone system, check how the GHG management system has been implemented and effectiveness is ensured.</i></p>	/MAIN/	<p>monitoring system following principles of quality management system has been developed and implemented for the monitoring of the project activity.</p> <p><i>Verifier's action:</i> The monitoring system covers:</p> <ol style="list-style-type: none"> 1. organizational structure of the CDM department; 2. internal audits procedures; 3. training plan; 4. handling data procedures; 5. data collection, analysis and calculation procedures; 6. data checking and storage procedures; 7. roles and responsibilities. <p>During the site visit, the verification team was able to check the consistency of the procedures by interviews and reports.</p> <p><i>Conclusion:</i> A robust monitoring system following principles of quality management system has been successfully implemented.</p>		
<p>C.4. Metering diagram (EB 75, Annex 7, C; PS §196)</p> <p><i>Check first if the MR includes a metering diagram showing all relevant monitoring points.</i></p> <p><i>Check further if this diagram reflects the actual situation and is in line with the registered PDD and with the requirements of the applied methodology.</i></p>	/MR/ /PS/	<p><i>Description:</i> A metering diagram is included showing the relevant monitoring points and is in accordance with the registered PDD and ACM0001.</p> <p><i>Verifier's action:</i> The diagram is included in section C of the MR and clearly shows all important monitoring points of the project activity.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> A metering diagram is included and reflects the actual situation and it is in line with the registered PDD and with the requirements of the applied methodology.		
C.5. Roles and Responsibilities (EB 75, Annex 7, C; PS §196) <i>Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented as stated in the monitoring plan. Please consider the complete data trail from raw data generation to submission of the final data.</i> <i>Identify, if relevant personnel w.r.t. monitoring has been exchanged?</i> <i>If so, have appropriate training measures been carried out.</i> <i>In case of changes, assure that the implemented monitoring procedures have not been affected.</i>	/IM01/ /MAIN/ /TRAIN/	<i>Description:</i> The roles, positions and responsibilities are clearly defined. <i>Verifier's action:</i> During the site visit, the verification team checked the organizational chart of the landfill and interviewed operational and managerial staff and observed that the roles and positions are clearly defined and implemented as stated in the monitoring plan. The involved personnel is properly trained and qualified for their tasks. <i>Conclusion:</i> The roles and positions are clearly defined and in line with the MP and only dully qualified personnel are involved in the monitoring procedures.	OK	OK
C.6. Emergency procedures for the monitoring system (EB 75 Annex 7, C; PS §196) <i>Check, as appropriate, whether relevant emergency procedures for the monitoring system have been included in the MR and assess whether these procedures have been implemented, when required</i>	/PS/ /IM01/ /MAIN/	<i>Description:</i> The procedures in case of equipment failure or accidents are established and well defined. Automatic alarms and emergency calls are implemented procedures of the project activity. In addition, a landfill responsible has full access to the CDM department supervisor at any time. The actions taken in case of equipment failures are documented in detail. <i>Verifier's action:</i> The procedures could be checked by the	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>verification team by means of interviews and review of log books and reports. In addition, the Emergency Plan has been presented.</p> <p><i>Conclusion:</i> Troubleshooting procedures are properly implemented.</p>		
<p>C.7. Data archive and data protection (PS §56 b)</p> <p>Check whether all records of monitoring parameters are archived according to the monitoring plan.</p> <p>Assess further whether appropriate measures have been taken in order to avoid unintended or intended manipulation or loss of the measured data.</p>	/IM01/	<p><i>Description:</i> Data records for all monitored parameters are archived according to the MP. For almost all parameters, except <u>electricity imported</u> and <u>regulatory requirements relating to LFG projects</u> data is recorded every 4 minutes onto a data logger and then through a software provided by ABB called <u>FTS</u> (File Transfer Schedule) the files (extension .B00) are extracted from the data logger and transferred to the site server (with automatic validity check) four times a day and are stored on a FTS folder. For imported electricity, readings are taken manually by the operator at least once a month and then electronic archived in the site server. The electricity meter also keeps the accumulated energy imported.</p> <p><i>Verifier's action:</i> During the site visit, the verification team could assess the procedures for data archive have been established and implemented by means of interviews and also retrieving data from the computer server on the biogas plant site.</p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> All records of monitoring parameters are archived according to the monitoring plan.		
D. Data and parameters				
D.1. Data and Parameters fixed ex ante				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>a) Compliance with registered PDD (EB 75 Annex 7; D1, VVS § 246 (d)) Check whether the value applied is in compliance with the registered PDD.</p>	<p>/MR/ /PDD/ /unfccc/</p>	<p>Description: The fixed parameters are:</p> <ul style="list-style-type: none"> - GWP_{CH_4} (factor used for converting methane to carbon dioxide equivalents); - D_{CH_4} (Methane density); - $CEF_{electricity}$ (CO₂ emissions intensity if electricity imported); - EF_{EL} (Emission factor for electricity generation for project activity consumption); - TDL (Average technical transmission and distribution losses for providing electricity to project activity); - P_n (Atmospheric pressure at normal conditions); - R_u (Universal ideal gas constant); - T_n (Temperature at normal conditions); - AM_j (Atomic mass of element j – carbon, hydrogen, oxygen and nitrogen); - MV_n (Volume of one mol of any ideal gas at normal conditions); - MM_i (Molecular mass of component i – methane, carbon dioxide, oxygen and nitrogen); - MF_{O_2} (Oxygen volumetric fraction of air); - AF (Adjustment Factor). <p>All parameters are in accordance with the monitoring plan of the registered PDD. The value of GWP_{CH_4} which was 21 until 2012 has been updated for the 2nd commitment period to 25 as per UNFCCC directives (Decision</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Compliance with the applied methodology (EB 75 Annex 7; D1) Check whether the value applied is in compliance with the applied methodology or any other tool.	/ MR/ / PDD/ / ACM01/	<p><i>Description:</i> The fixed parameters are GWP_{CH_4}; D_{CH_4}; $CEF_{electricity}$; EF_{EL}; TDL; P_n; R_u; T_n; AM_i; MV_n; MM_i; MF_{O_2}; and AF and they are in accordance with applied methodology.</p> <p><i>Verifier's action:</i> The MR was reviewed and cross-checked against the PDD and the applied methodology.</p> <p><i>Conclusion:</i> The fixed parameters are in accordance with the PDD and the applied methodology.</p>	OK	OK
D.2. Data and Parameters monitored				
D.2.1. LFG_{flare1} for flare stack 1		Description: Total amount of landfill gas captured for flare stack 1		
a) Measurement / Determination method (VVS, §§ 233, 236) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the	/ IM01/ / PDD/ / ACM01/ / MT/ / MR/	<p><i>Description:</i> According to the MP, the parameter shall be measured by a flow meter and data shall be automatically and continuously monitored, recorded and aggregated monthly and yearly.</p> <p>A V-Cone + Differential pressure transmitter has been installed to measure the parameter and the data is continuously read and measured and it is recorded every 4 minutes automatically by supervisory system (manufacturer ABB).</p> <p>No equipment has been exchanged during the monitoring period.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system. As described in section D.2 of the MR, this type of flow meter uses the Bernoulli principle generating a pressure drop through an obstacle and the manufacturer provides an algorithm to translate the pressure difference into a flow.</p> <p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	<p>/CAL/ /MAIN/ /MR/ /XLS/</p>	<p><i>Description:</i> The V-Cone does not require any periodic calibration, as it does not suffer alterations over the operating conditions, but it is opened and cleaned once a year to verify that there is no accidental obstruction of the flow (as recommended by the manufacturer). The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician.</p> <p>The differential pressure transmitter needs to be calibrated annually according to manufacturer's specifications. The plant technician checks daily if the flow is within the operating range of the differential pressure transmitter. Also, he measures the residual gas velocity in several points of the LFG plant using a portable anemometer and registers the values on an electronic daily control sheet. In case of a significant drift of the parameter he can adjust</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>the valves of the several LFG collection wells throughout the landfill to bring the biogas flow to optimum conditions. The last calibrations were on 2011-05-23 and 2012-05-16.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications. The reported values in the MR are correct and sufficiently justified.</p> <p>In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p>It was evidenced that the technician (plant operator) has competence to fulfill his duties. He received training from the manufacturer of the biogas plant. Training certificates were provided^{/TRAIN/} and reviewed by the verification team.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p>	/MR/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value of the monitored parameter stated in the MR is correct and sufficiently justified.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>data control system at the site with corresponding ER spreadsheets. The ER excel sheets were reviewed and the algorithm provided by the manufacturer has been dully used in the calculations to determine the flow.</p> <p><i>Conclusion:</i> The report values of the parameter are correct.</p>		
D.2.2. LFG_{flare2} for flare stack 2		Description: Total amount of landfill gas captured for flare stack 2		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a flow meter and data shall be automatically and continuously monitored, recorded and aggregated monthly and yearly.</p> <p>A V-Cone + Differential pressure transmitter has been installed to measure the parameter and the data is continuously read and measured and it is recorded every 4 minutes automatically by supervisory system (manufacturer ABB).</p> <p>No equipment has been exchanged during the monitoring period.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system. As described in section D.2 of the MR, this type of flow meter uses the Bernoulli principle generating a pressure drop through an obstacle and the manufacturer provides an algorithm to translate the pressure difference into a flow.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.		
b) Accuracy and QA/QC Procedure (VVS, §§ 237-243) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/CAL/ /MAIN/ /MR/ /XLS/	<i>Description:</i> The V-Cone does not require any periodic calibration, as it does not suffer alterations over the operating conditions, but it is opened and cleaned once a year to verify that there is no accidental obstruction of the flow (as recommended by the manufacturer). The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician. The differential pressure transmitter needs to be calibrated annually according to manufacturer's specifications. The plant technician checks daily if the flow is within the operating range of the differential pressure transmitter. Also, he measures the residual gas velocity in several points of the LFG plant using a portable anemometer and registers the values on an electronic daily control sheet. In case of a significant drift of the parameter he can adjust the valves of the several LFG collection wells throughout the landfill to bring the biogas flow to optimum conditions. The last calibrations were on 2011-05-23 and 2012-05-16. <i>Verifier's action:</i> The calibration certificates ^{/CAL/} and equipment manuals ^{/MAIN/} have been presented to the verification team. The calibration is up to date and in	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>accordance with monitoring plan and manufacturer's specifications. The reported values in the MR are correct and sufficiently justified.</p> <p>In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p>It was evidenced that the technician (plant operator) has competence to fulfill his duties. He received training from the manufacturer of the biogas plant. Training certificates were provided^{/TRAIN/} and reviewed by the verification team.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value of the monitored parameter stated in the MR is correct and sufficiently justified.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets. The ER excel sheets were reviewed and the algorithm provided by the manufacturer has been dully used in the calculations to determine the flow.</p> <p><i>Conclusion:</i> The report values of the parameter are correct.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
D.2.3. PE_{flare1} for flare stack 1		Description: Project emissions from flaring of the residual gas stream through flare stack 1		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> As described at the MP, the parameter is calculated as per the “Tool to determine project emissions from flaring gases containing Methane” with parameters LFG_{flare1}, W_{CH4}, fv_i, $fv_{CH4,FG}$ and t_{O2}.</p> <p>The parameter is automatically calculated by excel file using the formulas described in the registered PDD to calculate the emission reductions.</p> <p><i>Verifier’s action:</i> The parameter is calculated and not measured. The spreadsheet has been checked in detail by the verification team and all formulas, constants and ex-ante fixed parameters were cross-checked against registered PDD to confirm that the calculations are consistent. All monitored parameters used in the calculation are addressed in detail in this section and are deemed to be correct.</p> <p><i>Conclusion:</i> The parameter is calculated in accordance with the tool and the registered PDD and MP.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies</i></p>	<p>/CAL/ /PDD/ /MR/ /XLS/</p>	<p><i>Description:</i> As the parameter is not directly monitored, an excel file was used to automatically calculate the emission reductions.</p> <p><i>Verifier’s action:</i> The verification team checked the excel sheet in detail to ensure no deviation of the formulas, constants and ex-ante fixed parameters in the PDD and</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</p> <p>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</p>	/MAIN/	<p>that it is in compliance with the tool.</p> <p>Conclusion: The parameter is calculated in accordance with the tool, the registered PDD and the MP.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</p> <p>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</p> <p>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>	<p>/MR/ /MT/ /XLS/ /PDD/</p>	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p>Description: The value given at the MR and the corresponding Excel sheet is correct.</p> <p>Verifier's action: The MR and excel spreadsheet were intensively checked. No deviations from registered PDD and MP and from the respective tool have been detected.</p> <p>Conclusion: The values given in the MR and the excel spreadsheet are consistent and justified.</p>	OK	OK
D.2.4. PE_{flare2} for flare stack 2		Description: Project emissions from flaring of the residual gas stream through flare stack 2		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied</p>	<p>/IM01/ /PDD/ /ACM01/ /MT/</p>	<p>Description: As described at the MP, the parameter is calculated as per the "Tool to determine project emissions from flaring gases containing Methane" with parameters LFG_{flare2}, W_{CH4}, fv_i, fv_{CH4,FG} and t_{O2}.</p> <p>The parameter is automatically calculated by excel file using the formulas described in the registered PDD to</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/MR/	<p>calculate the emission reductions.</p> <p><i>Verifier's action:</i> The parameter is calculated and not measured. The spreadsheet has been checked in detail by the verification team and all formulas, constants and ex-ante fixed parameters were cross-checked against registered PDD to confirm that the calculations are consistent. All monitored parameters used in the calculation are addressed in detail in this section and are deemed to be correct.</p> <p><i>Conclusion:</i> The parameter is calculated in accordance with the tool and the registered PDD and MP.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/CAL/ /PDD/ /MR/ /XLS/ /MAIN/	<p><i>Description:</i> As the parameter is not directly monitored, an excel file was used to automatically calculate the emission reductions.</p> <p><i>Verifier's action:</i> The verification team checked the excel sheet in detail to ensure no deviation of the formulas, constants and ex-ante fixed parameters in the PDD and that it is in compliance with the tool.</p> <p><i>Conclusion:</i> The parameter is calculated in accordance with the tool, the registered PDD and the MP.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
c) Correctness (VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /MT/ /XLS/ /PDD/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The value given at the MR and the corresponding Excel sheet is correct. <i>Verifier's action:</i> The MR and excel spreadsheet were intensively checked. No deviations from registered PDD and MP and from the respective tool have been detected. <i>Conclusion:</i> The values given in the MR and the excel spreadsheet are consistent and justified.	OK	OK
D.2.5. W_{CH4}		Description: Methane fraction in the landfill gas		
a) Measurement / Determination method (VVS, §§ 233, 236) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination</i>	/IM01/ /PDD/ /ACM01/ /MT/ /MR/	<i>Description:</i> According to the MP, a gas sample shall be preferably analyzed by a gas quality analyzer and continuously recorded through a data logger. An infrared analyzer is used to measure the CH ₄ and the data is automatically monitored and recorded every 4 minutes automatically. No equipment has been exchanged during the monitoring period. <i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system. <i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		methodology.		
b) Accuracy and QA/QC Procedure (VVS, §§ 237-243) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/CAL/ /MAIN/ /MR/ /XLS/	<p><i>Description:</i> The monitoring equipment is automatically verified (auto calibration system) by a command at the ABB supervisory system which is weekly performed by the plant technician. The monitoring equipment has to be calibrated on an annual basis according to manufacturer's specifications. The last calibrations have been performed as by the manufacturer's specifications. Calibrations were done on 2011-04-13, 2012-03-12 and 2013-03-12.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. Calibrations have been carried out by external laboratory using traceable standards.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications. The reported values in the MR are correct and sufficiently justified.</p>	OK	OK
c) Correctness (VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment</i>	/MR/ /XLS/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The values given in the MR are correct and consistent with the data collected during site visit.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>spreadsheets.</p> <p><i>Conclusion:</i> The values reported in the MR are correct and sufficiently justified.</p>		
D.2.6. T₁		Description: Temperature of the landfill gas delivered to flare stack 1		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a temperature gauge to determine the density of methane. It is used to normalize the landfill gas volume LFG_{flare1} at normal temperature.</p> <p>A thermo-resistance type PT100 is used to monitor the temperature and the data is continuously read and measured and is recorded every 4 minutes automatically. The equipment has been exchanged twice during the MP.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p> <p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for</i></p>	<p>/CAL/ /MAIN/ /MR/</p>	<p><i>Description:</i> The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician.</p> <p>The equipment is either calibrated or exchanged on an annual basis. During the MP, the exchanged equipment</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/XLS/	<p>has been zero calibrated on 2011-01-28, 2011-12-14 and 2012-11-14.</p> <p>In addition, the plant technician checks daily the landfill gas temperature using a portable device to verify any inconsistency with the data.</p> <p><i>Verifier's action:</i> The zero installation certificates^{/CAL/} provided by the supplier and equipment manuals^{/MAIN/} have been presented to and reviewed by the verification team. In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}. Moreover, the portable device has also been calibrated as recommended by the manufacturer.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications. The reported values in the MR are correct and sufficiently justified.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment</i></p>	/MR/ /XLS/ /PDD/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value given in the MR is correct and consistent with the data collected during site visit.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><i>Conclusion:</i> The values applied at the report are correct.</p>		
D.2.7. T₂		Description: Temperature of the landfill gas delivered to flare stack 2		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a temperature gauge to determine the density of methane. It is used to normalize the landfill gas volume LFG_{flare2} at normal temperature.</p> <p>A thermo-resistance type PT100 is used to monitor the temperature and the data is continuously read and measured and is recorded every 4 minutes automatically. The equipment has been exchanged once during the MP.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p> <p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for</i></p>	<p>/CAL/ /MAIN/ /MR/</p>	<p><i>Description:</i> The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician.</p> <p>The equipment is either calibrated or exchanged on an annual basis. During the MP, the exchanged equipment</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/XLS/	<p>has been zero calibrated on 2011-09-21 and 2012-08-29. In addition, the plant technician checks daily the landfill gas temperature using a portable device to verify any inconsistency with the data.</p> <p><i>Verifier's action:</i> The zero installation certificates^{/CAL/} provided by the supplier and equipment manuals^{/MAIN/} have been presented to and reviewed by the verification team. In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}. Moreover, the portable device has also been calibrated as recommended by the manufacturer.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications. The reported values in the MR are correct and sufficiently justified.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should</i></p>	/MR/ /XLS/ /PDD/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value given in the MR is correct and consistent with the data collected during site visit.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><i>Conclusion:</i> The values applied at the report are correct.</p>		
D.2.8. P₁		Description: Pressure of the landfill gas delivered to flare stack 1		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a pressure gauge to determine the density of methane. It is used to normalize the landfill gas volume LFG_{flare1} at normal pressure.</p> <p>An absolute pressure transmitter Capacitive Silicon Sensor is used to monitor the pressure and the data is continuously read and measured and is recorded every 4 minutes automatically.</p> <p>No equipment has been exchanged during the monitoring period. During the calibration period a backup equipment (also calibrated) has substituted the main one, which was put in place after calibration.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p> <p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p>	<p>/CAL/ /MAIN/</p>	<p><i>Description:</i> The parameter is automatically verified by a command at the ABB supervisory system which is weekly</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/MR/ /XLS/	<p>performed by the plant technician.</p> <p>In addition, he checks daily landfill gas pressure using a portable pressure transmitter to measure the relative pressure inside the flare 1 pipe. Other portable device provides the atmospheric pressure, then it is possible to calculate the absolute pressure inside the pipe</p> <p>Calibrations have been performed as per manufacturer's specification on 2011-07-31 and 2012-07-04 at the main equipment and on 2012-06-15 for the backup.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. Calibrations have been carried out by competent external laboratories using traceable standards.</p> <p>In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p>Moreover, the portable device has also been calibrated as recommended by the manufacturer.</p> <p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p>	/MR/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value given in the MR is correct and</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/XLS/ /PDD/</p>	<p>consistent with the data collected during site visit.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p> <p><i>Conclusion:</i> The values reported in the MR are correct.</p>		
D.2.9. P₂		Description: Pressure of the landfill gas delivered to flare stack 2		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a pressure gauge to determine the density of methane. It is used to normalize the landfill gas volume LFG_{flare2} at normal pressure.</p> <p>An absolute pressure transmitter Capacitive Silicon Sensor is used to monitor the pressure and the data is continuously read and measured and is recorded every 4 minutes automatically.</p> <p>No equipment has been exchanged during the monitoring period. During the calibration period a backup equipment (also calibrated) has substituted the main one, which was put in place after calibration.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.		
b) Accuracy and QA/QC Procedure (VVS, §§ 237-243) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/CAL/ /MAIN/ /MR/ /XLS/	<p><i>Description:</i> The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician.</p> <p>In addition, he checks daily landfill gas pressure using a portable pressure transmitter to measure the relative pressure inside the flare 2 pipe. Other portable device provides the atmospheric pressure, then it is possible to calculate the absolute pressure inside the pipe</p> <p>Calibrations have been performed as per manufacturer's specification on 2011-07-19 and 2012-07-24 at the main equipment and on 2012-06-15 for the backup.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. Calibrations have been carried out by competent external laboratories using traceable standards.</p> <p>In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p>Moreover, the portable device has also been calibrated as recommended by the manufacturer.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.		
c) Correctness (VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/ /PDD/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The value given in the MR is correct and consistent with the data collected during site visit. <i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets. <i>Conclusion:</i> The values reported in the MR are correct.	OK	OK
D.2.10. EL_{IMP}		Description: Total amount of electricity imported to meet project requirement (from both grid and diesel generator)		
a) Measurement / Determination method (VVS, §§ 233, 236) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged</i>	/IM01/ /PDD/ /ACM01/ /MT/ /MR/	<i>Description:</i> According to the MP, the parameter shall be measured to determine the CO ₂ emissions that result from the use of electricity and other energy in the project activity. A microprocessor electricity meter is used to continuously measure the consumption of electricity. <i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	<p>/CAL/ /MAIN/ /MR/ /XLS/</p>	<p><i>Description:</i> Calibrations have been performed on 2011-03-24, 2012-02-16 and 2013-04-16. There was a delay of 2 months between the 2nd and 3rd calibrations.</p> <p>Nevertheless, being more conservative, as the calibrations presented errors of -3.51%, -3.18% and -1.0% (respectively) have been identified. As the errors of the first two calibrations were above the permissible error of the equipment (+/- 3.0%), it was used as a corrective index of the highest one (3.51%) for the entire monitoring period.</p> <p><i>Verifier's action:</i> The installation certificates provided by the supplier (zero calibration) and the periodic calibration certificates have both been presented to and reviewed by the verification team.</p> <p><i>Conclusion:</i> The equipment presented an error over the permissible at 2 calibrations and a corrective index has been applied for the entire monitoring period.</p>	OK	OK
<p>c) Correctness</p>	<p>/MR/</p>	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
(VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/XLS/ /PDD/	<i>Description:</i> The value given in the MR is correct and consistent with the data collected during site visit and the application of the corrective index is also correct. <i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the stored data records with corresponding ER spreadsheets. <i>Conclusion:</i> The values applied at the report are correct.		
D.2.11. Regulatory requirements relating to landfill gas projects		Description: Regulatory requirements relating to landfill gas projects		
a) Measurement / Determination method (VVS, §§ 233, 236) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination</i>	/IM01/ /PDD/ /ACM01/ /MT/ /MR/	<i>Description:</i> Although the information is recorded annually it is only used for changes to the adjustment factor or the amount of methane that would have been destroyed / combusted during the year in the absence of the project at the renewal of the crediting period. <i>Verifier's action:</i> The MR was reviewed and it is in line with the MP of the registered PDD. <i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>				
b) Accuracy and QA/QC Procedure (VVS, §§ 237-243) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/MR	<p><i>Not applicable for this parameter.</i></p>	N/A	N/A
c) Correctness (VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/ /PDD/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> There were no changes in the relevant regulatory requirements relating to landfill gas projects. <i>Verifier's action:</i> The verification team could not identify any change either in local and national legislation regarding mandatory requirements for LFG capture and flaring. <i>Conclusion:</i> The reported information in the MR is correct.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
D.2.12. fv_i		Description: Volumetric fraction of component i in the residual dry gas where $i = \text{CO}_2, \text{O}_2$		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</p> <p>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</p> <p>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p><i>Description:</i> According to the MP, a gas sample will be analyzed by a gas analyzer and logged into a data logger at least hourly.</p> <p>An infrared analyzer is used to measure the CO_2 and an electrochemical sensor is used to measure the O_2, and the data is automatically monitored and recorded every 4 minutes automatically.</p> <p>No equipment has been exchanged during the monitoring period.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p> <p><i>Conclusion:</i> The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</p>	<p>/CAL/ /PDD/ /MAIN/ /ACM01/ /MT/</p>	<p><i>Description:</i> The PP has installed the equipment to increase the accuracy of the monitoring of the efficiency of the flare, as described in the registered PDD.</p> <p>The precision of the measurement equipment is automatically verified (auto calibration system) by a command at the ABB supervisory system which is weekly performed by the plant technician. The monitoring equipment has to be calibrated on an annual basis according to manufacturer's specifications.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>		<p>In addition, for a consistency check, the plant technician daily measures the fraction of O₂ and CO₂ of landfill gas using a portable device.</p> <p>Calibrations have been performed as by the manufacturer's specifications. The calibrations were done on 2011-04-13, 2012-03-12 and 2013-03-12.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. Calibrations have been carried out by competent external laboratories using traceable standards.</p> <p>In addition, the verification team followed an entire checking session performed by the plant technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p>Moreover, the portable device has also been calibrated as recommended by the manufacturer.</p> <p><i>Conclusion:</i> All calibration and maintenance procedures have followed the manufacturer's recommendations and the requisites of the MP in the registered PDD have been fulfilled.</p>		
c) Correctness (VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring</i>	/ MR / / XLS /	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The values given in the MR are correct and consistent with the data collected during site visit.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/PDD/	<p>Verifier's action: The value has been reviewed during the site visit by cross-checking against the data records stored in the data control system at the site with corresponding ER spreadsheets.</p> <p>Conclusion: The values reported in the MR are correct and sufficiently justified.</p>		
D.2.13. $fv_{CH_4,FG}$		Description: Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p>Description: According to the MP, a gas analyzer shall be used to measure the concentration of CH₄. An infrared analyzer is used to measure the CH₄ and the data is automatically monitored and recorded every 4 minutes automatically. No equipment has been exchanged during the monitoring period.</p> <p>Verifier's action: During the site visit the verification team had access to all equipment and data control system.</p> <p>Conclusion: The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Accuracy and QA/QC Procedure (VVS, §§ 237-243) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/CAL/ /MAIN/ /MR/ /XLS/	<p><i>Description:</i> The monitoring equipment is automatically verified (auto calibration system) by a command at the ABB supervisory system which is weekly performed by the plant technician. The monitoring equipment has to be calibrated on an annual basis according to manufacturer's specifications.</p> <p>Calibrations have been performed as by the manufacturer's specifications. The calibrations were done on 2011-04-13, 2012-03-12 and 2013-03-12.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. Calibrations have been carried out by external laboratory using traceable standards.</p> <p><i>Conclusion:</i> All calibration and maintenance procedures have followed the manufacturer's recommendations and the requisites of the MP in the registered PDD have been fulfilled.</p>	OK	OK
c) Correctness (VVS, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should</i>	/MR/ /XLS/ /PDD/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The values given in the MR are correct and consistent with the data collected during site visit.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>be given.</p> <p>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>		<p>Conclusion: The values reported in the MR are correct and sufficiently justified.</p>		
D.2.14. t_{O2}		Description: Volumetric fraction of O ₂ in the exhaust gas of the flare		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</p> <p>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</p> <p>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/</p>	<p>Description: According to the MP, a gas analyzer shall be used to measure the volumetric fraction of O₂ in the exhaust gas of the flare.</p> <p>An electrochemical sensor is used and the data is automatically monitored and recorded every 4 minutes automatically.</p> <p>Verifier's action: During the site visit the verification team had access to all equipment and data control system.</p> <p>Conclusion: The monitoring of this parameter is in line with the registered MP of the PDD and with the applied methodology.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance</p>	<p>/CAL/ /MAIN/ /MR/ /XLS/</p>	<p>Description: The monitoring equipment is automatically verified (auto calibration system) by a command at the ABB supervisory system which is weekly performed by the plant technician. The monitoring equipment has to be calibrated on an annual basis according to manufacturer's specifications.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>		<p>Calibrations have been performed as by the manufacturer's specifications. The calibrations were done on 2011-04-13, 2012-03-12 and 2013-03-12.</p> <p><i>Verifier's action:</i> The calibration certificates^{/CAL/} and equipment manuals^{/MAIN/} have been presented to the verification team. Calibrations have been carried out by external laboratory using traceable standards.</p> <p>In addition, in case it is needed, the plant technician can check manually with a portable gas analyzer the oxygen volumetric fraction of the flare exhaust gas by disconnecting the hose which brings the exhaust gas to the fixed gas analyzer and connecting it to the portable device for a plausibility check.</p> <p><i>Conclusion:</i> All calibration and maintenance procedures have followed the manufacturer's recommendations and the requisites of the MP in the registered PDD have been fulfilled.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should</i></p>	<p>/MR/ /XLS/ /PDD/</p>	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The values given in the MR are correct and consistent with the data collected during site visit.</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><i>Conclusion:</i> The values reported in the MR are correct and sufficiently justified.</p>		
D.2.15. T_{flare1}		Description: Temperature in the exhaust gas of the flare stack 1		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/ /MAIN/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a thermocouple type N to determine the temperature in the exhaust gas of the flare.</p> <p>A thermocouple type N is used to monitor the temperature and the data is continuously read and measured and is recorded every 4 minutes automatically.</p> <p>The temperature in which the flare operates is in accordance with the manufacturer's specifications for the equipment and it is in accordance with UK Environment Agency's guidance about landfill gas flaring.</p> <p>For a certain period (2010-09-01 to 2012-01-07), the temperature has not being monitored in the exhaust gas of the flare until 2012-01-07. A TDfMM has been presented (PRC-1506-001) and approved by the EB on 2012-08-28.</p> <p>Therefore, a minimum temperature of 780°C must be guaranteed for the monitored flare temperature (combustion zone) in order to claim emission reductions. So, for this 4th MP, from 2011-12-01 to 2012-01-07 (both days included), the emission reductions were calculated taking into account such requirement on flare temperature. It does result in a decrease of 42 tCO₂e from the total emission reductions claimed over the 4th monitoring</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>period. From 2012-01-08 onwards, the flare temperature was monitored at 80% of total flare height as per the applicable Tool and a minimum temperature of 500°C (default value of the tool) was considered to calculate emission reductions.</p> <p>In addition, the equipment has been exchanged twice during the MP.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p> <p><i>Conclusion:</i> The monitoring of this parameter is from 2012-01-08 in line with the registered MP of the PDD and with the applied methodology.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	<p>/CAL/ /MAIN/ /MR/ /XLS/</p>	<p><i>Description:</i> The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician.</p> <p>The equipment is either calibrated or exchanged on an annual basis. During the MP, the exchanged equipment has been zero calibrated on 2011-01-27, 2011-12-12 and 2012-11-19.</p> <p>Nevertheless, the installation of the new equipment has occurred after the expiration of the calibration validity of the replaced one (as the zero calibration can occur before the effective installation of the equipment), thus CAR C1 was raised.</p> <p><i>Verifier's action:</i> The zero installation certificates^{/CAL/}</p>	CAR C1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>provided by the supplier and equipment manuals^{/MAIN/} have been presented to and reviewed by the verification team. In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications. Nevertheless, as there was a delay in the installation, the finding was raised.</p> <p>(CAR C1) It was verified during the site visit that the new thermocouples for Flare 1 (TC-CR11189/12) and 2 (TC-CR11190/12) have been installed after the expiration of the validity of the calibration of the replaced ones (TC-CR12909/11 – Flare 1; TC-CR12908/11 – Flare 2).</p> <p>This information is missing at Section C and the necessary actions have not been considered at the ER calculations.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should</i></p>	<p>/MR/ /XLS/ /PDD/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The delay of the installation has not been considered. Thus, CAR C1 was raised.</p> <p>From 2011-12-01 to 2012-01-07 (both days included), the emission reductions were calculated in accordance with the approved TDfMM (PRC-1506-001).</p> <p><i>Verifier's action:</i> The value has been reviewed during the</p>	CAR C1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p> <p><i>Conclusion:</i> The values applied at the report need to be revised.</p> <p>Refer to CAR C1 above.</p>		
D.2.16. T_{flare2}		Description: Temperature in the exhaust gas of the flare stack 2		
<p>a) Measurement / Determination method (VVS, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /MT/ /MR/ /MAIN/</p>	<p><i>Description:</i> According to the MP, the parameter shall be measured by a thermocouple type N to determine the temperature in the exhaust gas of the flare.</p> <p>A thermocouple type N is used to monitor the temperature and the data is continuously read and measured and is recorded every 4 minutes automatically.</p> <p>The temperature in which the flare operates is in accordance with the manufacturer's specifications for the equipment and it is in accordance with UK Environment Agency's guidance about landfill gas flaring.</p> <p>For a certain period (2010-09-01 to 2012-01-07), the temperature has not being monitored in the exhaust gas of the flare until 2012-01-07. A TDfMM has been presented (PRC-1506-001) and approved by the EB on 2012-08-28.</p> <p>Therefore, a minimum temperature of 780°C must be guaranteed for the monitored flare temperature (combustion zone) in order to claim emission reductions.</p> <p>So, for this 4th MP, from 2011-12-01 to 2012-01-07 (both</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>days included), the emission reductions were calculated taking into account such requirement on flare temperature. It does result in a decrease of 42 tCO₂e from the total emission reductions claimed over the 4th monitoring period. From 2012-01-08 onwards, the flare temperature was monitored at 80% of total flare height as per the applicable Tool and a minimum temperature of 500°C (default value of the tool) was considered to calculate emission reductions.</p> <p>In addition, the equipment has been exchanged twice during the MP.</p> <p><i>Verifier's action:</i> During the site visit the verification team had access to all equipment and data control system.</p> <p><i>Conclusion:</i> The monitoring of this parameter is from 2012-01-08 in line with the registered MP of the PDD and with the applied methodology.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 237-243)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p>	<p>/CAL/ /MAIN/ /MR/ /XLS/</p>	<p><i>Description:</i> The parameter is automatically verified by a command at the ABB supervisory system which is weekly performed by the plant technician.</p> <p>The equipment is either calibrated or exchanged on an annual basis. During the MP, the exchanged equipment has been zero calibrated on 2011-01-27, 2011-12-12 and 2012-11-19.</p> <p>Nevertheless, the installation of the new equipment has occurred after the expiration of the calibration validity of the replaced one (as the zero calibration can occur before</p>	CAR C1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>		<p>the effective installation of the equipment), thus CAR C1 was raised.</p> <p><i>Verifier's action:</i> The zero installation certificates^{/CAL/} provided by the supplier and equipment manuals^{/MAIN/} have been presented to and reviewed by the verification team. In addition, the verification team followed an entire checking session performed by the technician using the portable device and checked the Internal Activities Report^{/MAIN/}.</p> <p><i>Conclusion:</i> The calibration is up to date and in accordance with monitoring plan and manufacturer's specifications. Nevertheless, as there was a delay in the installation, the finding was raised.</p> <p>(CAR C1) It was verified during the site visit that the new thermocouples for Flare 1 (TC-CR11189/12) and 2 (TC-CR11190/12) have been installed after the expiration of the validity of the calibration of the replaced ones (TC-CR12909/11 – Flare 1; TC-CR12908/11 – Flare 2).</p> <p>This information is missing at Section C and the necessary actions have not been considered at the ER calculations.</p>		
<p>c) Correctness (VVS, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative</i></p>	<p>/MR/ /XLS/ /PDD/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The delay of the installation has not been considered. Thus, CAR C1 was raised.</p> <p>From 2011-12-01 to 2012-01-07 (both days included), the emission reductions were calculated in accordance with</p>	CAR C1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>manner.</p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>the approved TDfMM (PRC-1506-001).</p> <p><i>Verifier's action:</i> The value has been reviewed during the site visit by cross-checking the data records stored in the data control system at the site with corresponding ER spreadsheets.</p> <p><i>Conclusion:</i> The values applied at the report need to be revised.</p> <p>Refer to CAR C1 above.</p>		
D.3. Sampling				
<p>a) Implementation of sampling plan (EB75 Annex 7; D3)</p> <p><i>Check whether the PP has applied a sampling approach to determine the monitored values (as per section D.2 above).</i></p> <p><i>If this is the case, please provide an assessment whether the PPs have correctly and sufficiently described the implemented sampling plan including</i></p> <p>a) <i>Description of the implemented sampling design</i></p> <p>b) <i>Collected data</i></p> <p>c) <i>Analysis of collected data</i></p> <p>d) <i>Demonstration on whether the required confidence/precision has been met.</i></p>	<p>/PDD/ /MR/</p>	<p><input checked="" type="checkbox"/> No sampling approach has been used by the PP to determine the monitored parameters</p> <p>OR</p> <p><input type="checkbox"/> A sampling approach has been taken for the following monitored parameter.</p>	N/A	N/A

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Sampling during verification <i>In case the VT has applied a sampling approach in the course of the verification the approach shall be described for each parameter.</i>	/PDD/ /MR/	<input type="checkbox"/> No sampling approach has been used by the VT to verify the monitored parameters OR. <input checked="" type="checkbox"/> A sampling approach has been applied by the VT for the following monitored parameter: LFG _{flare1} for flare stack 1; LFG _{flare2} for flare stack 2; W _{CH4} ; T ₁ ; T ₂ ; P ₁ ; P ₂ ; EL _{IMP} ; fv _i ; fv _{CH4,FG} ; t _{O2} ; T _{flare1} and T _{flare2} which are parameters continuously read and measured and recorded every 4 minutes automatically. The verification team has checked the presented data of the parameters the raw data directly from the system. Exhausting checking with all parameters in different dates, times (including downtimes) has been performed and the VT could verify the integrity and accuracy of the presented information. In addition, the VT could testify the robustness of the system and inviolability of the information. The sampling has been performed as follows: 1. Parameter LFG _{flare1} for flare stack 1: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>2. Parameter LFG_{flare2} for flare stack 2: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>3. Parameter W_{CH4}: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>4. Parameter T_1: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>5. Parameter T_2: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>6. Parameter P_1: monthly aggregated data have been checked 100% for all 17 months within the</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>7. Parameter P_1: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>8. Parameter EL_{IMP}: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>9. Parameter fv_i: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>10. Parameter $fv_{CH_4,FG}$: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>months; 4-minute data have been checked a complete day;</p> <p>11. Parameter t_{O_2}: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>12. Parameter T_{flare1}: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day;</p> <p>13. Parameter T_{flare2}: monthly aggregated data have been checked 100% for all 17 months within the monitoring period; daily compiled data have been checked one complete month and 3 days of other 5 months; 4-minute data have been checked a complete day.</p>		
E. Calculation of Emission reductions				
E.1. Traceability (VVS, §§ 212, 214) <i>Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spread-</i>	/XLS/	<i>Description:</i> An Excel calculation spreadsheet was used. The calculations are completely traceable from the raw data and the formulae applied are in line with MP and are visible.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>sheet shall be used. All applied formulae must be visible.</i>		<p><i>Verifier's action:</i> An unprotected Excel calculation spreadsheet has been provided and is completely visible. Only the cells which contain the input raw data imported to excel via Data Manager (and that were dully cross-checked by the verification team, as explained above in detail) are protected by password from the supervisory system manufacturer provider (ABB) to avoid any manipulation of data.</p> <p>The formulas in the excel sheet were reviewed in detail against the MP, applied methodology and tools.</p> <p><i>Conclusion:</i> The calculations are fully traceable and all formulae applied are consistent with the MP, the applied tools and methodology.</p>		
<p>E.2. Parameter consistency (VVS, § 214)</p> <p><i>Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?</i></p> <p><i>Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure the consistency of notations for all parameters in the PDD, MR and calculation spreadsheet.</i></p>	/XLS/ /MR/	<p><i>Description:</i> All monitored parameters and data used for the calculations are applied consistently in the MR and ER calculation sheet.</p> <p><i>Verifier's action:</i> The verification team performed a complete review of MR, ER calculations sheet, methodology and relevant reference documents.</p> <p><i>Conclusion:</i> All internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spread sheet.</p>	OK	OK


Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
E.3. Correctness of calculation (VVS, §§ 244-245) <i>Check if the applied formulae and methods for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan and / or the approved methodology.</i> <i>Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.</i> <i>Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.</i>	/XLS/ /MR/ /PDD/	<p><i>Description:</i> The ER calculations are complete and reflect the requirements of the registered monitoring plan. The calculations are completely traceable.</p> <p>Nevertheless, the installation of the new equipment to monitor T_{Flare1} and T_{Flare2} has occurred after the expiration of the calibration validity of the replaced one and this has not been considered, CAR C1 was raised.</p> <p><i>Verifier's action:</i> The input values applied in the calculations were cross-checked by the verification team against the raw data stored in the site server.</p> <p>No standard or old values were used in the calculations where calculations based on up-to-date data is required.</p> <p><i>Conclusion:</i></p> <p>Refer to CAR C1 below.</p>	CAR C1	OK
E.4. Emission reductions table (EB 75, Annex 7, E.4) <i>Check if the MR includes a summary table of the emission reductions calculation specifying separately</i> <ul style="list-style-type: none"> - Total baseline emissions - Total project emissions: - Total leakage 	/XLS/ /MR/	<input checked="" type="checkbox"/> The MR includes in section E.4 a summary table of the emission reductions calculation. <input checked="" type="checkbox"/> The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately. <input type="checkbox"/> The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.	CAR C1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>- <i>Total emission reductions.</i></p> <p><i>Assess whether the values are correct or need to be revised as a consequence of issues identified above.</i></p>		<p><input checked="" type="checkbox"/> During the verification, issues with impact on the ER calculation have been identified. Thus subject to the closure of above listed findings the summary table in E.4 needs to be revised.</p> <p>In this context the following additional findings have been identified:</p> <p>Refer to CAR C1 above.</p>		
<p>E.5. Comparison with ex-ante determined emission reductions (EB 75, Annex 7, E.5; E.6)</p> <p><i>Check if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD.</i></p> <p><i>Check further whether in case of an increase an appropriate explanation is included in the MR.</i></p> <p><i>Assess in case of a significant increase whether this is due to technical or organizational changes within or outside the control of the PP and – if this is case – whether the PRC have been considered appropriately.</i></p>	<p>/XLS/ /MR/ /PDD/ /WWR/</p>	<p><i>Description:</i> An increase of 1.89% in the emission reductions in comparison with the estimated in the registered PDD has been observed.</p> <p>The GWP_{CH4} has been updated for the months of 2013 for the values presented at the registered PDD.</p> <p>The increase is due to a better methane capture rate (due to the extension of the gas collection system as landfilling progresses which was achieved by some improvements of the landfill operating practices performed during this period); methane destruction rate; and project emissions due to electricity consumption.</p> <p>Section E.6 presents several tables and explanations to justify the increase.</p> <p>Nevertheless, CL E1 was raised as the total amount of waste for the months of 2013 is not presented which is not consistent with the MP.</p> <p>In addition, the delay in the installation of the</p>	<p>CAR C1 CL E4</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>thermocouples have not been considered, thus CAR C1 was raised and need to be closed in order to allow a correct comparison.</p> <p><i>Justification of evidences:</i> The Waste Weighbridge Report was checked and the interviews have been performed during the visit with operating personnel.</p> <p><i>Conclusion:</i></p> <p>(CAR C1) It was verified during the site visit that the new thermocouples for Flare 1 (TC-CR11189/12) and 2 (TC-CR11190/12) have been installed after the expiration of the validity of the calibration of the replaced ones (TC-CR12909/11 – Flare 1; TC-CR12908/11 – Flare 2).</p> <p>This information is missing at Section C and the necessary actions have not been considered at the ER calculations.</p> <p>(CL E1) At Table 6 of Section E.6, the total amount of waste input for the months of January, February, March and April of 2013 is not provided.</p>		
<p>E.6. ER during the 1st commitment period and the period from 1 January 2013 onwards (EB 75, Annex 7, E.7)</p> <p><i>Check if the MR includes in chapter E.7 a breakdown</i></p>	/MR/	<p><input checked="" type="checkbox"/> The MR in section E.7 includes a summary table of the ER breakdown</p> <p>a) ER up to 2012-12-31 and</p> <p>b) ER from 2013-01-01 onwards</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>of the actual ER into</i></p> <p><i>a) ER up to 2012-12-31 and</i></p> <p><i>b) ER from 2013-01-01 onwards</i></p> <p><i>The ERs for each period should be determined as per the actual generation. In cases where this is not possible or a cap has been applied a proportional (time related) approach should be chosen.</i></p>		<p><input checked="" type="checkbox"/> The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows:</p> <p><input type="checkbox"/> The ER have completely been generated during the first commitment period</p> <p><input type="checkbox"/> The ERs have completely been generated from 2013-01-01 onwards,</p> <p><input checked="" type="checkbox"/> The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards.</p> <p><input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.</p> <p>In this context the following additional findings have been identified:</p> <p>N/A</p>		

ANNEX 2: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL



Statement of Competence
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Sergio Cruz


SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2015-08-02
VCS / ISO 14064-2	Lead Assessor	2015-08-02

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies
13.1	Waste handling and disposal

185 – Rev. 2, Date: 2012-08-03

801-P001-mv-1 / 2012-08-03



Statement of Competence
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Marcelo Sebben


SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2016-04-07
VCS / ISO 14064-2	Assessor	2016-04-07

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewable energies	
13.1	Waste handling and disposal	

297 – Rev. 3 Date: 2013-08-22

801-VA006-F20-mv-1 / 2013-08-22



Statement of Competence
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Emilio Martin


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2016-02-04
VCS / ISO 14064-2	Senior Assessor	2016-02-04

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewable Energies	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Tidal
13.1	Waste Handling and Disposal	13.1.1 Waste Management 13.1.2 Waste Water Management

157 – Rev. 3, Date: 2013-02-05

801-VA006-F20-mv-3 / 2013-02-05



Statement of Competence
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Alexandra Nebel

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2016-03-03
Ji	Senior Assessor Technical Reviewer	2016-03-03
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2016-03-03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
14.1	Forestry

095 – Rev. 4, Date: 2013-03-04

801-VA006-F20-mv-1 / 2013-03-04