




**Verification and certification report form for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills UNFCCC ID: 0545 TN P-No. : 8000467119– 16/169
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
Version number of the verification and certification report	1.2
Completion date of the verification and certification report	07/04/2020
Monitoring period number and duration of this monitoring period	MP 8 01/10/2016 - to 30/06/2018 (including both days)
Version number of the monitoring report to which this report applies	4.0
Crediting period of the project activity corresponding to this monitoring period	15/12/2013 – 14/12/2020 (including both days)
Project participants	<p>Durban Solid Waste (DSW) – eThekweni municipality Netherlands' Ministry of Infrastructure and the Environment (IenM); Electrabel N.V.;</p> <p>Netherlands' Ministry of Economic Affairs, Agriculture and Innovation (EL&I); Government of Finland – Ministry of Foreign Affairs of Finland;</p> <p>RWE Power AG; Chubu Electric Power Co. Inc; The Chugoku Electric Power Co. Inc; Kyushu Electric Power Co. Inc.;</p> <p>Mitsubishi Corporation; Tohoku Electric Power Co. Inc.;</p> <p>The Tokyo Electric Power Co. Inc.;</p> <p>Japan International Cooperation Agency (JICA); Mitsui & Co. Ltd.;</p> <p>Government of Norway – Ministry of Foreign Affairs; Norsk Hydro ASA; Equinor ASA;</p>

	BP Alternative Energy International Ltd; GDF SUEZ; Government of Sweden - Swedish Energy Agency; International Bank for Reconstruction and Development (IBRD) as Trustee of the Prototype Carbon Fund (PCF)
Host Party	South Africa
Applied methodologies and standardized baselines	CDM Methodology: ACM0001 ver 15: "Large-scale Consolidated Methodology: Flaring or use of landfill gas" Standardized Baseline: ASB0001 ver. 01.0: "Standardized baseline: Grid Emission Factor for the Southern African power pool"
Mandatory sectoral scopes	Scope: 1, 13 / Technical Area: 1.2, 13.1
Conditional sectoral scopes, if applicable	Scope: N.a / Technical Area: N.a.
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	117,344 t CO _{2e}
Certified amount of GHG emission reductions or GHG removals for this monitoring period	79,105 t CO _{2e}
Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH; E-0022
Name, position and signature of the approver of the verification and certification report	 Sud Evgeni Final Approver

SECTION A. Executive summary

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The International Bank for Reconstruction and Development (IBRD), as Trustee of the Prototype Carbon Fund (PCF) has commissioned the TÜV NORD JI/CDM Certification Program to carry out this periodic verification of the project:

“Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills”

with regard to the relevant requirements for CDM project activities.

This verification covers the period as indicated on the title page.

The project reduces GHG emissions due to collection and destruction in gas engine for power generation of landfill gas from the operational Mariannhill landfill in the city of Durban in South Africa. The landfill is now receiving approximately 1000-1200 tonnes of waste per day. The PP has and is constructing gas collection system including vertical and horizontal wells. The landfill gas (LFG) used to generate electricity in a 1 MW gas engine generator set by Jenbacher. Further landfill gas is destroyed as to be burnt in an enclosed flare. The electricity generated is fed into the national grid of South Africa. By this the project activity reduces greenhouse gases in destroying the methane contained in the landfill gas as well as in replacing electricity in the connected grid which is mainly generated using fossil fuels.

Further the previously included landfill gas project at La Mercy landfill has been decommissioned and is no further in use.

Details of the project location are given in table A-1 below:

Table A-1: Project Location

No.	Project Location
Host Country	South Africa
Region:	KwaZulu Natal Province
Project location address:	Municipality of eThekweni
Latitude:	-29.846389
Longitude:	30.837778

Basic technical details of the project are summarized in table A-2.

Table – A-2: Technical data of the project activity

Parameter	Unit	Value
Electricity generator (Jenbacher type 320)	MW	1.0
Number of Electricity generator (Jenbacher type 320)	-	1
Vertical extraction wells	-	11
Horizontal gas collection wells (total number of wells including shut down wells)	-	29
Horizontal gas collection wells closed (due to e.g. bad LFG quality, low LFG amount, filling management, etc.)	-	4

Parameter	Unit	Value
Flare	Nm ³ /h	1,000
Number of flares		1

With the ongoing filling of the landfill since last verification 3 additional horizontal wells number HW27 to HW29 have been constructed. Four (4) wells HW8, HW9, HW 12, HW13 have been closed during last monitoring period and are still not used during this monitoring period due to bad LFG quality, low LFG amount, filling management or other reasons.

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,
- 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 this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	IR	Winter	Stefan	TÜV NORD CERT GmbH	X	X	X	X

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Rami	Kunal	TÜV NORD CERT GmbH
2.	Approver ¹	IR	Rami	Kunal	TÜV NORD CERT GmbH
3.	Approver ²	IR	Sud	Evgeni	TÜV NORD CERT GmbH

¹ Until end March due to availability and expiry of appointment

² In course of incomplete response

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

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.

Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
<input type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year ³ ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input checked="" type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
<input type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;
<input type="checkbox"/>	10 %	Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Raw data generation	Medium	<ul style="list-style-type: none"> - Missing data due to failure of measurement equipment - Installation of measuring equipment - Dysfunction of installed equipment - Lack of training of operational personnel 	<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 - Check of maintenance records

³ A year refers to a period of 12 consecutive months.

			<ul style="list-style-type: none"> - Downtimes of equipment - Exchange of equipment - Insufficient accuracy - Change of technology - Accuracy of values supplied by Third Parties 	<ul style="list-style-type: none"> - Counter-check of raw data - Check of CDM management system - Check of CDM related procedures - Application of CDM management system procedures - Check of trainings - Check of responsibilities - Check of QA/QC documentation / evidences of involved third parties
2.	Raw data collection and data aggregation	Medium	<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"> - 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 (if applicable) - Check of data archiving system - Check of application of Management system procedures
3.	Missing data due to failure of measurement equipment	Low	<ul style="list-style-type: none"> - The monitoring plan defines emergency procedures in case a meter fails. Besides back-up meters are either installed or available onsite for fast exchange. 	<ul style="list-style-type: none"> - Check if related meters are installed as per monitoring plan. Check if emergency procedure is known across related personnel via interviews. Check back-up meters on correct calibration.
4.	Intentional or unintentional omissions and misstatements in data transfer from invoices (i.e. electricity invoices) or hand written notes (i.e. quantity of waste disposed in landfill for check purposes) into digital Excel ER spreadsheet	Medium	<ul style="list-style-type: none"> - Ineffective quality control of data transfer due to unclear QA/QC procedure 	<ul style="list-style-type: none"> - Counter check with evidences provided
5.	Monitoring reporting	Medium	<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"> - Counter check with evidences provided - Audit of procedure application
6.	Calculation Methods	Medium	<ul style="list-style-type: none"> - Applied formulae - Miscalculation - Mistakes in spread-sheet calculation 	<ul style="list-style-type: none"> - Countercheck on the basis of own calculation. - Spread sheet walk-through - Plausibility checks - Check of plots
7.	Other calculation parameters	Low	<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"> - Update-check of regulatory framework - Countercheck of the applied MP in the MR against the

			- Supporting documentation version updates	methodology and the PDD
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On the basis of the risk analysis the verification has been planned. A detailed audit/verification plan has been prepared and submitted to the project participant(s) in due time before the onsite inspection.

C.2. Consideration of materiality in conducting the verification

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Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach*	Errors* detected	Findings reference	Corrected	Remaining verification risk
V _{LFG,total,y,db}	CDC	<input type="checkbox"/>	-	<input type="checkbox"/>	-
V _{LFG,sent_flare,y,db}		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
V _{LFG,EL,y,db}		<input type="checkbox"/>	-	<input type="checkbox"/>	-
T _t		<input type="checkbox"/>	-	<input type="checkbox"/>	-
P _t		<input type="checkbox"/>	-	<input type="checkbox"/>	-
p _{H20,t,Sat}		<input type="checkbox"/>	-	<input type="checkbox"/>	-
V _{CH4,t,db}		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
EG _{PJ,y}		<input type="checkbox"/>	-	<input type="checkbox"/>	-
EC _{PJ,y}		<input type="checkbox"/>	-	<input type="checkbox"/>	-
Op _{engine,h}		<input type="checkbox"/>	-	<input type="checkbox"/>	-
Op _{flare,h}		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
Flame _m		<input type="checkbox"/>	-	<input type="checkbox"/>	-
T _{EG,m}		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
TDL _y		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
BE _{CH4, SWDS,y}		<input type="checkbox"/>	-	<input type="checkbox"/>	-
Management of SWDS		<input type="checkbox"/>	-	<input type="checkbox"/>	-
Aggregate					Materiality threshold not exceeded

*) incl. omissions and misstatements

+*) Verification Approaches:

CDC:

NDC:

SPL:

ASP:

COM:

Complete data check of data including all data aggregation steps

Non-complete data check – omissions not material

Sampling approach (all data available)

Acceptance Sampling

Data check at higher data aggregation levels and sampling at original data levels

The verification was basically carried out as per the verification plan. However, based on the actual situation on-site and the errors, omissions and misstatements identified during the verification minor deviations from the original plan occurred. However, due to the insignificance no major revision of the overall plan was required. Esp. there was no need for significant modification of the sampling approaches or for additional / less locations to be visited during the on-site.

SECTION D. Means of verification

D.1. Desk/document review

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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.

D.2. On-site inspection

Duration of on-site inspection: 08/04/2019 to 09/04/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting: Round of introduction, attendance register, final confirmation of the audit plan	PP office	08/04/2019	Stefan Winter (SW)
2.	General introduction of the project activity, current status, changes, etc.	PP office	08/04/2019	
3.	Site visit to Mariannhill landfill site: - Verify facilities and equipment (LFG collection and transport system, LFG pre-treatment, elec. Generation unit, elec. Meters, CH4 monitoring, T- and P-meters, DCS) - Data collection and aggregation - Interview with data coordinators, process engineers and other key personnel at site	Mariannhill landfill and project site	08/04/2019	
4.	Document check: - Check QMS records, maintenance records, instrument specifications, monitoring diagram, calibration records, training and qualification records - Check of operation logs and the data collecting/archiving /calculation process - Any further documents relevant to be checked	PP office	08/04/2019 - 09/04/2019	
5.	Review of emission reductions calculation	PP office	09/04/2019	
6.	Closing meeting: Summary of the audit Presentation of identified issues	PP office	09/04/2019	

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Wright	Marc	D.S.W./ Project Engineer	08/04/2019 – 09/04/2019	All issues	SW
2.	Winn	Richard	DSW Env. & Conservancy	08/04/2019	General PA issues	
3.	Sealreew	Peter	Peter's Plant	08/04/2019	Engine	
4.	Sewchurra	Sanjeeth	eThekwini	08/04/2019	Electricity dept. /	

	n		Municipality/ Electrical Engineer		Invoicing	
5.	Middleton	Mason	Peter's Plant	08/04/2019	Engine	
6.	Nhlengethwa	Mfundo	DSW	08/04/2019	Operations Engineer	
7.	Pass	Jonathan	Wilson & Pass Inc./Technic al and admin advice to D.S.W.	08/04/2019 – 09/04/2019	All issues	
8.	Singh	Vishan	Envitech	08/04/2019 – 09/04/2019	CDM Flaring	
9.	Antoni-Naidoo	Mia	SGS	08/04/2019	Air Quality Monitoring	

D.4. Sampling approach

D.4.1 Sampling during monitoring

<input checked="" type="checkbox"/>	No sampling approach has been used by the PP to determine the monitored parameters				
<input type="checkbox"/>	A sampling approach has been taken for the following monitored parameter(s):				
	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size
	n.a.				

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling
 AS: Acceptance Sampling

²⁾ Sampling Types:

PS: Parameter Sampling

D.4.2 Sampling approaches during verification

<input checked="" type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters				
<input type="checkbox"/>	A sampling approach has been applied by the VT for the following monitored parameter(s):				
	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size
	n.a.				

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾ Sampling Types:

AS: Acceptance Sampling
 PS: Parameter Sampling
 COM: Full data check at higher data aggregation levels and sampling at original data levels

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	0	1	0
Compliance of the project implementation and operation with the registered PDD	0	0	0
Post-registration changes	0	0	0
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	0	0	0
Compliance of monitoring activities with the registered monitoring plan	1	2	0
Compliance with the calibration frequency requirements for measuring instruments	0	0	0
Assessment of data and calculation of emission reductions or net removals	0	2	1
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (missing docs)	0	1	0
Total	1	6	1

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	<p>A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /MRT/ • /unfccc/ 	
Findings	<input type="checkbox"/>	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	<input type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: CAR 1
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The PP has provided a monitoring report for the related monitoring period to be verified. After correction of raised issues during verification assessment the final MR is based on latest template available and filled according to the instructions to fill the form.	

E.2. Remaining forward action requests from validation and/or previous verifications

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. Likewise FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the PDD ^{/PDD/} and the previous verification report ^{/VER/}, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the latest version of the validation report.
<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have not yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

<input type="checkbox"/>	N/A – as this is the first monitoring period for this CDM project activity.
<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have not yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment.</p> <p>Further it has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied.</p> <p>Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context.</p> <p>Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /MR/ • /VVS/ • /XLS/ • /VER/ • /LPL/ • /CAUD/ • /TS/ • /unfccc/
Findings	<input checked="" type="checkbox"/> The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof

		have been identified in the course of this verification.
	<input type="checkbox"/>	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): - N/A
	<input type="checkbox"/>	In this context the following CARs, CLs have been raised:
	<i>In case of phased implementation:</i>	
	<input type="checkbox"/>	N/A
	<input checked="" type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.
<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A or add as appropriate	
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>At the project site vertical and horizontal wells are constructed to extract landfill gas from the Mariannhill landfill which is still in operation. The PP has also installed a landfill gas extraction system consisting of a blower, gas cleaning system as well as methane destruction equipment such as a flare of up to 1000 m³/h and a Jenbacher gas engine of 1 MW. The gas engine is connected with a generator and via a transformer generated electricity is fed into the connected grid. The 6 baseline wells are still existent but no landfill gas is produced from those wells and they have been physically disconnected to the LFG gas network system as confirmed via onsite inspection.</p> <p>The network of gas collection wells has been expanded on a phased basis as the site continues to develop. During this monitoring period additional 3 horizontal wells HW27-29 have been installed.</p>	

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
<input type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)
		Appr.date	

	Ref.No.	
<input checked="" 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. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.	
	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:

E.4.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.
<input type="checkbox"/>	The following corrections have been applied:
	1 Issue:
	2 Issue:
	The PDD has been revised accordingly: (New) version No.: Revision date:
	It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.
	<input checked="" type="checkbox"/> A related post registration change has been submitted prior to the issuance request. The approval has been received on 12/10/2015 via approval number PRC-0545-002. <input type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.

E.4.3. Change to the start date of the crediting period of the project activity

<input checked="" type="checkbox"/>	N/A - as this is not the first verification within the crediting period
<input type="checkbox"/>	The PPs do not intend to change the start date of the crediting period.
<input type="checkbox"/>	As the change in the start date was below the related time period as indicated in PS § 234 and § 235 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
<input type="checkbox"/>	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 236 and as per §237 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are

	in line with the related requirements of the VVS and PS.
<input type="checkbox"/>	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z

E.4.4. Inclusion of a monitoring plan

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 238 and §78 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 78 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
<input type="checkbox"/>	In line with PS § 238 and §78 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period								
<input checked="" type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC								
1	<table border="1"> <tr> <td>Title</td><td> <p>The monitoring plan has been updated w.r.t. the following points and issues:</p> <ol style="list-style-type: none"> 1. Flow diagram has been updated to include the measurement points in PDD w.r.t. actual conditions found onsite 2. Removal of three parameters for monitoring of LFG volume on wet basis as the LFG is monitored on dry basis. ($V_{LFGsent_flare,y,wb}$, $V_{LFGtotal,y,wb}$ and $V_{LFGEL,y,wb}$) 3. Revision of QA/QC and additional comment for parameter w.r.t volumetric flow of LFG 4. The reg PDD is updated w.r.t. the parameter as per tool "Project emissions from flaring" ver 2 SPEC_{flare} in section B.6.2. The tool states that the flare specifications have to be documented in the CDM-PDD. 5. The monitoring plan as per reg PDD B.7.1 is updated w.r.t. the parameter $PH_{20,t,Sat}$ as indicated in related tool for gaseous stream. 6. Parameter P_t and T_t: The QA/QC procedure is updated to be consistent with the "tool to determine the mass flow of a greenhouse gas in a gaseous stream". Finally the monitoring frequency is also corrected. 7. Parameter $EG_{PJ,y}$: The measurement procedure is updated to be consistent with the related methodology. Further the determination of net elec. is further specified in line with the onsite observation where the elec. import is deducted from the export generated by the gas engine via bi-directional meter. 8. Parameter $Op_{flare,h}$: As per onsite only a flame detection is used for determination of the flare operation however two criteria are mentioned in PDD. 9. Ex-ante fixed parameter OX has been deleted as already parameter OX_{top_layer} in line with methodology ACM0001 is given. </td></tr> <tr> <td>Status</td><td><input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved</td></tr> <tr> <td>Aprr.date</td><td>12/10/2015</td></tr> <tr> <td>Ref. No.</td><td>PRC-0545-002</td></tr> </table>	Title	<p>The monitoring plan has been updated w.r.t. the following points and issues:</p> <ol style="list-style-type: none"> 1. Flow diagram has been updated to include the measurement points in PDD w.r.t. actual conditions found onsite 2. Removal of three parameters for monitoring of LFG volume on wet basis as the LFG is monitored on dry basis. ($V_{LFGsent_flare,y,wb}$, $V_{LFGtotal,y,wb}$ and $V_{LFGEL,y,wb}$) 3. Revision of QA/QC and additional comment for parameter w.r.t volumetric flow of LFG 4. The reg PDD is updated w.r.t. the parameter as per tool "Project emissions from flaring" ver 2 SPEC_{flare} in section B.6.2. The tool states that the flare specifications have to be documented in the CDM-PDD. 5. The monitoring plan as per reg PDD B.7.1 is updated w.r.t. the parameter $PH_{20,t,Sat}$ as indicated in related tool for gaseous stream. 6. Parameter P_t and T_t: The QA/QC procedure is updated to be consistent with the "tool to determine the mass flow of a greenhouse gas in a gaseous stream". Finally the monitoring frequency is also corrected. 7. Parameter $EG_{PJ,y}$: The measurement procedure is updated to be consistent with the related methodology. Further the determination of net elec. is further specified in line with the onsite observation where the elec. import is deducted from the export generated by the gas engine via bi-directional meter. 8. Parameter $Op_{flare,h}$: As per onsite only a flame detection is used for determination of the flare operation however two criteria are mentioned in PDD. 9. Ex-ante fixed parameter OX has been deleted as already parameter OX_{top_layer} in line with methodology ACM0001 is given. 	Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved	Aprr.date	12/10/2015	Ref. No.	PRC-0545-002
Title	<p>The monitoring plan has been updated w.r.t. the following points and issues:</p> <ol style="list-style-type: none"> 1. Flow diagram has been updated to include the measurement points in PDD w.r.t. actual conditions found onsite 2. Removal of three parameters for monitoring of LFG volume on wet basis as the LFG is monitored on dry basis. ($V_{LFGsent_flare,y,wb}$, $V_{LFGtotal,y,wb}$ and $V_{LFGEL,y,wb}$) 3. Revision of QA/QC and additional comment for parameter w.r.t volumetric flow of LFG 4. The reg PDD is updated w.r.t. the parameter as per tool "Project emissions from flaring" ver 2 SPEC_{flare} in section B.6.2. The tool states that the flare specifications have to be documented in the CDM-PDD. 5. The monitoring plan as per reg PDD B.7.1 is updated w.r.t. the parameter $PH_{20,t,Sat}$ as indicated in related tool for gaseous stream. 6. Parameter P_t and T_t: The QA/QC procedure is updated to be consistent with the "tool to determine the mass flow of a greenhouse gas in a gaseous stream". Finally the monitoring frequency is also corrected. 7. Parameter $EG_{PJ,y}$: The measurement procedure is updated to be consistent with the related methodology. Further the determination of net elec. is further specified in line with the onsite observation where the elec. import is deducted from the export generated by the gas engine via bi-directional meter. 8. Parameter $Op_{flare,h}$: As per onsite only a flame detection is used for determination of the flare operation however two criteria are mentioned in PDD. 9. Ex-ante fixed parameter OX has been deleted as already parameter OX_{top_layer} in line with methodology ACM0001 is given. 								
Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved								
Aprr.date	12/10/2015								
Ref. No.	PRC-0545-002								

	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB 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, PCfMM or PCfSB 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 PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

The above stated changes to the monitoring period have been identified during this monitoring period but have been already approved. The final monitoring report and the project activity are now in line with the latest approved monitoring plan.

E.4.6. Changes to the project design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	Decommissioning of La Mercy LFG project activity
		Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
		Appr.date	25/11/2011
		Ref. No.	No ref. number as it was a notification of changes during first crediting period
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	
<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:		
	1	Issue:	
	2	Issue:	

E.4.7. Changes specific to afforestation and reforestation project activities

<input checked="" type="checkbox"/>	N/A - as this is no A/R project activity
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E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> • /MR/ • /ACM1/ • /TA/ • /unfccc/ 			
Findings	<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 breakdown of MP accordance 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 type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)
		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
		3	Title (of the tool)	Combined tool to identify the baseline scenario and demonstrate additionality
			Version	2.1
			MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)
		4	Title (of the tool)	Emissions from solid waste disposal sites
			Version	6.0.1
MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)			
5	Title (of the tool)	Project emissions from flaring		
	Version	2.0.0		
	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)		
6	Title (of the tool)	Tool to determine the mass flow of a		

			greenhouse gas in a gaseous stream
		Version	2.0.0
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the applicable SB is as follows:	
	1	Title (of the SB)	Standardized baseline: Grid Emission Factor for the Southern African power pool
	Version	ASB0001 ver. 01.0	
	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)	
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:	
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	The MP is completely in compliance with the last registered/approved version of the PDD / MP or standardized baseline or methodology.		

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	<p>By means of comparison of the MR and the ER calculation with the latest version of the registered PDD the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly. Further it has been checked whether the GWP for the respective period have been correctly applied.</p> <p>The following list of ex-ante fixed parameters have been applied:</p>				
	Nbr.	Parameter abbreviation	Description	Value	Unit
	1	OX _{top layer}	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline	0.1	-
	2	GWP _{CH4}	Global warming potential of CH4	25	tCO2e/tCH4
	3	D _{CH4}	Methane density	0.000716	tCH4/m ³ CH4
	4	φ	Model correction factor to account for model uncertainties	0.75	-
	5	F	Fraction of methane in the SWDS gas (volume fraction)	0.5	-
	6	f _v	Fraction of methane captured at the SWDS and flared, combusted or used in another manner	0	-
	7	η _{PJ}	The efficiency of the degassing system which will be installed in the project activity, in	50	%

		year y		
8	MCF	Methane Correction Factor	1.0	-
9	DOC _j	Fraction of degradable organic carbon (by weight) in the waste type j	Not applicable during verification	-
10	DOC _f	Fraction of degradable organic carbon (DOC) that can decompose	0.5	
11	k _j	Decay rate for the waste type j	Not applicable during verification	-
12	FE _{EL,k,y}	CO ₂ emissions intensity of the electricity displaced	0.9488	tCO ₂ e/MWh
13	η _{flare,m}	Flare Efficiency in the minute m	0, 50 or 80 depending on related criteria	%
14	R _u	Universal ideal gases constant	8,314	Pa.m/kmol.k
15	MM _i	Molecular mass of greenhouse gas i	16.04	kg/kmol for methane
16	P _n	Total pressure at normal conditions	101,325	Pa
17	T _n	Temperature at normal conditions	273.15	K
18	SPEC _{flare}	manufacturer's flare specifications for temperature, flow rate and maintenance schedule	Minimum Temperature: 500 °C Minimum Flow rate: 100 Nm ³ /h	°C and Nm ³ /h
<p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PDD/ • /PS/ • /VVS/ • /unfccc/ • /TOOL/ • /ACM1/ 				
Findings	<input checked="" type="checkbox"/>	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.		
	<input type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A		
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: -		
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	The values have been applied correctly. The value for the corresponding grid factor has been obtained from a standardized baseline for South Africa.			

E.6.2. Data and parameters monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).
Findings	For details please refer to appendix 4, CAR 3
Conclusion	<input type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	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. Further details as per Appendix 4 and 5.

E.6.3. Implementation of sampling plan

Means of verification	The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values. Further it has been checked whether the PPs have correctly applied the implemented sampling plan including (i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. The following sources of information have been used in this context: • /MR/ • /XLS/ • /PDD/.
Findings	<input checked="" type="checkbox"/> The PPs have not applied sampling approaches for the parameters monitored.
	<input type="checkbox"/> The PPs have applied sampling approaches for the following parameters monitored.
	1 Parameter: <input type="text"/>
	Name: <input type="text"/>
	Description on how the sampling efforts and survey comply with the validated sampling plan: <input type="text"/>
	2 Parameter: <input type="text"/>
	Name: <input type="text"/>
	Description on how the sampling efforts and survey comply with the validated sampling plan: <input type="text"/>
	<input type="checkbox"/> In this context the following CARs, CLs, FARs have been raised:
	-
Conclusion	<input checked="" type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	n.a.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated PDD and/or the applicable calibration standards. The results as well as the verification procedure are described equipment-wise in the
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		<p>project specific verification checklist (Appendix 6).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /CAL/ • /TS/ • /OPR/.
Findings	<input type="checkbox"/>	Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.
	<input checked="" type="checkbox"/>	<p>Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p>From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions.</p> <p>For details please refer to appendix 6</p>
	<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 03, CAR 06, FAR 01</p>
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>Please refer to Appendix 5 and esp. 6 for detailed assessment of the accuracy of each monitoring parameter and related equipment as well as their calibration dates and validity.</p> <p>Besides that and the already considered delays all monitoring equipment is duly calibrated for this entire monitoring period.</p> <p>FAR 01 has been raised due to availability of related value for TDL.</p>

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification		<p>During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • <i>Transparency</i>: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/, /WDR/, /REC/, /DSR/, /ELEB/, /ELER/, /GMR/ • /ACM1/ • /TA/ • /PDD/.
Findings	<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and,</p>

		where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	<input checked="" type="checkbox"/>	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 05
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
<p>Where corrections were required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.</p> <p>The baseline emissions are calculated as following: As no heat generation takes place at the site which is used and no natural gas is generated which is used e.g. via pipeline or bottles the baseline emissions are calculated as following:</p> $BE = BE_{CH_4,y} + BE_{EC,y}$ <p>$BE_{CH_4,y}$ = Baseline emissions of methane from the SWDS in year y $BE_{EC,y}$ = Baseline emissions associated with electricity generation in year y</p> $BE_{CH_4} = \left((1 - OX_{top_layer}) \cdot F_{CH_4,PI,y} - F_{CH_4,BL,y} \right) \cdot GWP_{CH_4}$ <p>OX_{top_layer} = Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline $F_{CH_4,PI,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year y $F_{CH_4,BL,y}$ = Amount of methane in the LFG that would be flared in the baseline in year y = 0 tCH₄/yr GWP_{CH_4} = Global warming potential of CH₄ (t CO₂e/t CH₄)</p> $F_{CH_4,PI,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y}$ <p>$F_{CH_4,flared,y}$ = Amount of methane in the LFG which is destroyed by flaring in year y $F_{CH_4,EL,y}$ = Amount of methane in the LFG which is used for electricity generation in year y</p> $F_{CH_4,flared,y} = F_{CH_4,sent_flare,y} - \frac{PE_{flare,y}}{GWP_{CH_4}}$ <p>$F_{CH_4,sent_flare,y}$ = amount of methane in the LFG which is sent to flare in year y $PE_{flare,y}$ = Project emissions from flaring of the residual gas stream in year y</p> $PE_{flare,y} = GWP_{CH_4} \cdot \sum_{n=1}^{525600} F_{CH_4,RG,y} \cdot (1 - \eta_{flare,m}) \cdot 10^{-3}$ <p>$F_{CH_4,RG,y}$ = mass flow of methane in the residual gas in the minute m (kg) $\eta_{flare,m}$ = flare efficiency in the minute m</p> <p>$F_{CH_4,sent_flare,y}$ and $F_{CH_4,EL,y}$ are determined via</p> $F_{i,t} = V_{t,db} \cdot V_{i,t,db} \cdot p_{i,t} \text{ and } p_{i,t} = P_t \cdot MM_i / R_u \cdot T_t$ <p>$F_{i,t}$ = Mass flow of greenhouse gas i in the gaseous stream in time interval t $V_{t,db}$ = Volumetric flow of the gaseous stream in time interval t on a dry basis $V_{i,t,db}$ = Volumetric fraction of greenhouse gas i in the gaseous stream in a time interval t on a dry basis</p>		

	<p> $\rho_{i,t}$ = Density of greenhouse gas i in the gaseous stream in time interval t P_t = Absolute pressure of the gaseous stream in time interval t MM_i = Molecular mass of greenhouse gas i R_u = Universal ideal gases constant T_t = Temperature of the gaseous stream in time interval t (K) </p> $BE_{EC,y} = \sum_k EC_{BL,k,y} \cdot EF_{EL,k,y} \cdot (1 + TDL_{k,y})$ <p> $EC_{BL,k,y}$ = the quantity of electricity that would be consumed by the baseline electricity consumption source k during the year y $EF_{EL,k,y}$ = the emission factor for the grid in year y $TDL_{k,y}$ = the average technical transmission and distribution losses in the grid in the year y for the voltage level at which electricity is obtained from the grid at the project site. </p> <p>A spreadsheet has been provided for each month with underlying data as obtained from the DCS as well as a monthly summary spreadsheet including the overall summary.</p> <p>Where corrections were required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.</p>
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E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	<p>During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/, /WDR/, /REC/, /DSR/, /ELEB/, /ELER/, /GMR/ • /ACM1/ • /TA/ • /PDD/. 	
Findings	<input type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>
	<input checked="" type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be

	closed out. For details please refer to Appendix 4.
	<p>Where corrections where required a revised PE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.</p> <p>Project emissions: Total project emissions are the sum of project emissions due to elec. consumption, use of fossil fuel and distribution of compressed/liquefied LFG using trucks.</p> <p>As there is no distribution of LFG and no consumption of fossil fuels, project emissions are calculated as follows:</p> $PE_y = PE_{EC,y}$ <p>PE_y = Project emissions in year y (t CO₂/yr) PE_{EC,y} = Emissions from consumption of electricity due to the project activity in year y (t CO₂/yr)</p> $PE_{EC,y} = \sum_j EC_{PJ,j,y} \cdot EF_{EL,j,y} \cdot (1 + TDL_{j,y})$ <p>EC_{PJ,j,y} = the quantity of electricity consumed by the project activity during the year y (MWh) EF_{EL,j,y} = the emission factor for the grid in year y TDL_{i,y} = the average technical transmission and distribution losses in the grid in the year y for the voltage level at which electricity is obtained from the grid at the project site</p> <p>A spreadsheet has been provided for each month with underlying data as obtained from the DCS as well as a monthly summary spreadsheet including the overall summary.</p> <p>Where corrections where required a revised PE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.</p>

E.8.3. Calculation of leakage GHG emissions

Means of verification	<p>During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation. Please refer to E.8.1 and E.8.2.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/, /WDR/, /REC/, /DSR/, /ELEB/, /ELER/, /GMR/ • /ACM1/ • /TA/ • /PDD/. 										
Findings	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No leakage emissions were to be considered (LE = 0).</td></tr> <tr> <td><input type="checkbox"/></td><td> <p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p> </td></tr> <tr> <td><input type="checkbox"/></td><td>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</td></tr> <tr> <td><input type="checkbox"/></td><td>In this context the following CARs, CLs, FARs have been raised:</td></tr> <tr> <td></td><td>-</td></tr> </table>	<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).	<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		-
<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).										
<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>										
<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.										
<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:										
	-										

Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		Where corrections were required a revised LE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct. Leakage: No leakage is applicable based on methodology. Therefore $LE_y = 0$.

E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately <ul style="list-style-type: none"> - Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions. It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.	
Findings	<input checked="" type="checkbox"/>	Section E.4 of the MR includes in 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.
	<input checked="" type="checkbox"/>	During the verification issues with impact on the ER calculation have been identified.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 04, CAR 05
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4. The final emission reductions are the difference between baseline emissions and project as well as leakage emissions: Initially as per published MR: $ER_y = BE_y - PE_y$ $= 79,348 \text{ t CO}_2\text{e} - 509 \text{ t CO}_2\text{e}$ $= 78,838 \text{ t CO}_2\text{e (due to rounding)}$ Final as per latest MR: $ER_y = BE_y - PE_y$ $= 79,678 \text{ t CO}_2\text{e} - 573 \text{ t CO}_2\text{e}$ $= 79,105 \text{ t CO}_2\text{e (due to rounding)}$

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	<input checked="" type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.

Conclusion	<input type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
No further assessment and justification required.		

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	<input checked="" type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	As the achieved amount of emission reductions is lower than the ex-ante calculated value for this monitoring period no further justification is required.	

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The verification team has checked chapter E.4 of the MR and the emission reduction calculation sheet /XLS/.			
Findings	<input checked="" type="checkbox"/>	The MR in section E.4 includes a summary table of the ER breakdown a) ER before 01/01/2013 and b) ER from 01/01/2013 onwards		
	<input checked="" type="checkbox"/>	The breakdown of the ERs before 01/01/2013 (during the first commitment period) and from 01/01/2013 onwards is as follows:		
	<input type="checkbox"/>	The ER have completely been generated before 01/01/2013 (during the first commitment period)		
	<input checked="" type="checkbox"/>	The ERs have completely been generated from 01/01/2013 onwards,		
	<input type="checkbox"/>	The ERs have partly been generated before 01/01/2013 (during the first commitment period) and partly from 01/01/2013 onwards.		
	<input checked="" type="checkbox"/>	The breakdown of the ERs is correct, considering the applicable guidance.		
		before 01/01/2013	from 01/01/2013	Sum
Emission reductions [tCO_{2e}]		0	79,105	79,105
Conclusion	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		
	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		

	The data provided in the MR is correct as well as the related breakdown. The calculations of GHG emission reductions or net anthropogenic GHG removals are in accordance with the project standard.
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E.9. Assessment of reported sustainable development co-benefits

Means of verification	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>The project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /PDD/ • /DSD/ • /unfccc/.
Findings	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>Therefore the DOE has assessed and confirms that:</p> <p>(a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”;</p> <p>(b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.</p>
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	-	

E.10. Global stakeholder consultation

Means of verification		<p>In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage.</p> <p>The monitoring report has been published from 25/02/2019 onwards.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /unfccc/.
Findings	<input checked="" type="checkbox"/>	No comments have been received on the published monitoring report for this monitoring period.
	<input type="checkbox"/>	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	<input type="checkbox"/>	<p>Comments have been received.</p> <p>The DOE has</p> <ul style="list-style-type: none"> - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the

		proposed CDM project activity, - assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below), - used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.		
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:		
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	As the DOE has concluded that comments are related to issues outside the CDM rules and requirements the comments and information gathered are listed as follows:			
	Nbr.	Original comment received	Feedback by the PP	Statement by DOE
	1			
	2			
	3			
	4			

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are 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 have been confirmed or revised. Furthermore reporting improvements might have been achieved.

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

After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

The International Bank for Reconstruction and Development (IBRD), as Trustee of the Prototype Carbon Fund (PCF) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 8th periodic verification of the project: "Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to collection and destruction of methane contained in landfill gas and substitution of mainly fossil fuel generated electricity from the connected grid. This verification covers the period from 01/10/2016 to 30/06/2018 (including both days).

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,

- 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,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above mentioned reporting period as stated on the title page.

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the project

“Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills”

registered under

UNFCCC-No. : 0545

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 08

from: 01/10/2016

to: 30/06/2018

(including both days) as follows:

Emission reductions: 79,105 tCO_{2e}.

Essen, 07/04/2020


Stefan Winter
Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved consolidated methodologies
BE	Baseline emissions
CL	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CH ₄	Methane
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
CL	Clarification Request
DA	Data Acquisition
DSW	Durban Solid Waste
DVerR	Draft Verification Report
EB	Executive Bord
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GSC	Global Stakeholder Consultation
GW	Gas well
HW	Horizontal well
IM	Interview Memo
IWCC	Inner West City Council
IPCC	Intergovernmental Panel on Climate Change
LE	Leakage emissions
LFG	Landfill Gas
MAT	Mean Annual Temperature
MAP	Mean Annual Precipitation
MP	Monitoring Plan or Monitoring Period
MR	Monitoring Report
MW	Mega Watt
Nm ³	Normalized cubic meters
PA	Project Activity
PDD	Project Design Document
PE	Project Emissions
PET	Potential Evapotranspiration

PP	Project Participant
PRC	Post Registration Changes
PS	Project Standard
QA/QC	Quality Assurance / Quality Control
SWDS	Solid Waste Disposal Site
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers



Statement of Competence

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

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 5, Date: 2017-07-20

163_001-V-0000-F20_2017-07-20_rev5

001-V-0000-F20 rev3 / 2012-10-26



Statement of Competence

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

Mr. Kunal Rami

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-03-26
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2020-03-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
6.1	Construction
7.1	Transport
13.1	Solid waste and wastewater

224 – Rev. 8, Date: 2018-08-31

001-V-0000-F20_2018-08-31_rev8.doc

001-V-0000-F20 rev3 / 2012-10-26

Appendix 3. Documents reviewed or referenced

No	Author	Reference	Title	References to the document	Provider
1	UNFCCC	/ACM1/	ACM0001 ver. 15 "Large-scale	https://cdm.unfccc	Other

No	Author	Reference	Title	References to the document	Provider
			Consolidated Methodology: Flaring or use of landfill gas" ASB0001 ver. 1 "Grid emission factor for the Southern African power pool"	http://methodologies/DB/JPYB4DYQUXQPZLBDVPHA87479EMY9Mhttps://cdm.unfccc.int/methodologies/standard_base/2015/sb4.html	
2	DOE	/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3	IPCC	/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
4	UNFCCC	/KP/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
5	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/OPMOP/index.html	Other
6	PP	/MR/	Monitoring Report for CDM project: "Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills" - version 1, dated 11/02/2019 - version 2, dated 30/05/2019 - version 3, dated 20/08/2019 - version 3, dated 27/08/2019 - version 4, dated 06/04/2020		Other
7	UNFCCC	/MRT/	Monitoring Report Form (CDM-MR-FORM), Version 7.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
8	UNFCCC	/PDD/	Project Design Document for CDM project: "Durban landfill-Gas-to-Electricity Project – Mariannhill and La Mercy Landfills", version 4, dated 30/06/2015	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view	Other
9	UNFCCC	/PS/	CDM Project Standard (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
10	PP	/VAL/	Validation Report for CDM project "Durban landfill-Gas-to-Electricity Project – Mariannhill and La Mercy Landfills" version 2, dated 31/01/2014 Assessment opinion regarding Post Registration Changes for CDM project "Durban landfill-Gas-to-Electricity Project – Mariannhill and La Mercy Landfills" version 0, dated 15/07/2015	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view	Other

No	Author	Reference	Title	References to the document	Provider
11	PP	/VER/	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view	Other
12	UNFCCC	/VVS/	CDM Validation and Verification Standard (Version 02.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
13	UNFCCC	/SAMPLE/	“Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities” (Version 04.0) “Standard for Sampling and Surveys for CDM Project Activities and Programme Activities” (version 7.0)	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
14	UNFCCC	/TA/	<ul style="list-style-type: none"> • Tool to calculate project or leakage CO2 emissions from fossil fuel combustion Version 2 • Emissions from solid waste disposal sites Version 7 • Project emissions from flaring Version 2.0.0 • Tool to calculate the emission factor for an electricity system Version 4.0 • Tool to determine the mass flow of a greenhouse gas in a gaseous stream Version 2.0.0 • Tool to determine the baseline efficiency of thermal or electric energy generation systems Version 1 • Project and leakage emissions from transportation of freight Version 1.1.0 	http://cdm.unfccc.int/Reference/tools/index.html	Other
15	UNFCCC	/GOT/	Glossary “CDM terms” (version 10.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20190917101421346-Glos_CDM.pdf/Glos_CDM.pdf?t=RHp8cHlyMmwyfDBjOKmR26kAE8Tb9GrOKPCq	Other
16	Other	/GRC/	NRS 057 SANA 474 (South African Grid Code)		Other
17	Other	/CAL/	<p>Certificate of Calibration of pressure transmitter;</p> <p>Certificate of Calibration of flow meters (E+H);</p> <p>Certificate of Calibration (Gascard NG);</p> <p>Certificate of Calibration of flame</p>		PP

No	Author	Reference	Title	References to the document	Provider
			detector; Calibration of exhaust gas temp., Calibration of Gas Cylinders; Calibration of elec. meters and confirmation Email of replacement date; Calibration of weigh bridges; Calibration of handheld gas analyzer; Letter by NIC Instruments Natal on calibration interval as per manufacturer dated 27/03/2015		
18	Envitech solutions DWA SGS	/CAUD/	<ul style="list-style-type: none"> Permit Compliance Audit of the Mariannhill G: L:B+ Landfill Site Located on Sub Lot 79 of Zeenoegeat No 937, Kwazulu Natal: Permit No: B33/2/1920/27/1/P241, dated January 2017 and July 2017 as well as January 2018 as well as July 2018 by Envitech Solutions. Landfill site permit for operation of the landfill 06/08/1996 by Department of Water Affairs and Forestry (DWA) B33/2/1920/27/1/P241 KZN/waste/LFG/002: Registration of the Mariannhill Landfill Gas Extraction and Recovery System at 1 Landfill Lane, Ethekewini Municipality, dated 21/06/2016 Letter of Appointment for SGS on Air Quality Monitoring Monthly Air Quality Monitoring Reports by SGS for this monitoring period as well as Annual summary report for 2016/17 and 2017/18 covering this monitoring period Annual Dust Performance Report 		PP
19	PP	/COM/	Contingency Management Plan. Cleansing and Solid Waste DSW, Mariannhill Landfill Site		PP
20	Envitech Solution	/DAT/	MH Site Record Sheet from 2016-10 to 2018-06		PP
21	Envitech Solution	/DPR/	CDM Data Processing: Step by Step Methodology (Envitech Solution)		PP
22	Envitech Solution	/DSR/	Daily site record sheet (Envitech Solution)		PP
23	PP	/ELEB/	Monthly Electricity Billing spreadsheet		PP
24	PP	/ELER/	Monthly Electricity Reading by metering department		PP
25	Eskom	/ESK/	Eskom Integrated Report 2018		PP

No	Author	Reference	Title	References to the document	Provider
.			dated 31 March 2018 for TDL values		
26	SGS	/FMA/	Test Report: Mariannhill Landfill Flow Meter Audits, dated 26/11/2014		PP
27	Envitech Solution	/GMR/	Monthly GAS WELL MONITORING REPORT: MARIANNHILL LANDFILL SITE for the entire monitoring period		PP
28		/LAW/	South Africa Carbon Tax National Env. Management: Waste Act, National Standard for the extraction, flaring or recovery of landfill gas, (Act No 59 of 2008), Dept. of Env. Affairs		
29		/LPL/	Mariannhill overall gas wells April 2019 (drawing) Invoice on payment for three new horizontal wells		PP
30		/MCL/	Methodology for the Calculation of CERs for the Durban/World Bank CDM Landfill Gas to Electricity Project (Version 4, August 2014)		PP
31		/WDR/	Waste delivery record for period 09/2016 until 06/2018		PP
33		/OPR/	Durban Gas to Electricity CDM Project: Operation & Maintenance (Minutes of Meeting 51 Held on 17 June 2014) DWS Report for solid waste management in the Durban metropolitan area, Nov 1998 Email by Rajesh Ramlagan (fleet manager) providing list of all vehicles used to collect waste in respective districts.		PP
34		/REC/	Mariannhill Monthly Report 2014B 22 13_15-Excel		PP
35	Various suppliers	/TS/	<ul style="list-style-type: none"> Pressure Transmitters PTX 7900 Series (data sheet) GA5000 Portable gas analyser (technical specification); Biogas 5000 Gas Analyser. Operating Manual; Gascard NG infrared Gas Monitoring Users Manual E+H Proline t-mass 65i Mass Flow Transmitter User's Guide E+H Omnigrad M TR10 temperature transmitter 		PP
36	PP	/TRAIN/	Trainings records		PP
37	PP	/XLS/	<ul style="list-style-type: none"> Initial, intermediate and final Emission reduction calculation summary spreadsheet Initial and final monthly CDM Data spreadsheets including raw data from the digital control system by Envitech Solutions 		PP
38	PP	/LSC/	<ul style="list-style-type: none"> Monitoring committee meeting reports for this monitoring period 		PP

No	Author	Reference	Title	References to the document	Provider
39	PP	/PPA/	• Power Purchase Agreement		PP

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

Table 3. Remaining FAR from validation and/or previous verifications

FAR ID	xx	Section no.	E.2	Date: DD/MM/YYYY
Description of FAR				
N/A				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 4. CL from this verification

CL ID	01	Section no.	D.2	Date: 09/04/2019
Description of CL				
Please clarify why details for CO2 measurement have been provided as this is not required for CH4 as per registered monitoring plan.				
Project participant response				Date: 30/05/2019
The CO2 Measurement on page 23 of the MR has been removed as it is not required for the calculations of the ER's.				
Documentation provided by project participant				
Revised MR version 2				
DOE assessment				Date: 02/07/2019
Ok. Related reference to CO2 measurement has been removed. Finding closed.				

Table 5. CAR from this verification

CAR ID	01	Section no.	A.1,	Date: 09/04/2019
Description of CAR				
Following editorial issues have been identified: Section A.1 refers to 72,465 tCO2e whereas the title page and other sections of MR refer to 78,838 tCO2e. Please unify. D.2 at several instances a date in format 1/06/2017 is given whereas as per instructions it should be DD/MM/YYYY. Pls specify.				
Project participant response				Date: 30/05/2019
MR version 2 has been revised. Total ERs have been updated as per the revision to the ER calculations, which is now 79,106 tCO2e. Section D.2 has also been revised to make sure all dates have the correct format.				
Documentation provided by project participant				
Revised MR version 2				
DOE assessment				Date: 21/08/2019

<p>Ok. The editorial issues have been corrected. The final emission reduction result achieved during this monitoring period have been unified throughout the MR ver 2.</p> <p>Further, all dates are now provided in the required format DD/MM/YYYY.</p> <p>However the following issues have been identified:</p> <ol style="list-style-type: none"> 1. Not the latest MR template version is applied. Latest template version for MR is version 7.0. 2. The list of project participants as per title page of MR is inconsistent with current active list of PPs as per related UNFCCC project webpage. During course of verification three PPs have withdrawn their participation in the project activity. Please unify. 3. Title page refers to Sectoral scope 13 only whereas the related UNFCCC project webpage also refers to sectoral scope 1. 	
Project participant response	Date: 27/08/2019
<p>1. Revised MR version 3 has been provided with MR template version 7.0.</p> <p>2. The project participants list and MR table now match those on the projects webpage.</p> <p>3. Sectoral scope 1 has been added.</p>	
Documentation provided by project participant	
Revised MR version 3	
DOE assessment	Date: 10/09/2019
<ol style="list-style-type: none"> 1. Ok. Updated MR ver 3 dated 27/08/2019 has been provided which is based on MR template version 7.0 2. Ok. The list of participants is now consistent with the active PPs as per related UNFCCC project webpage. 3. Ok. Title page now refers to both scopes 13 and 1. <p>As all remaining issues have been resolved this finding is closed.</p>	

CAR ID	02	Section no.	C	Date: 09/04/2019				
Description of CAR								
<p>During check of down times as given in section C against raw data in Scada it has been identified that the down time for the calibration of the pressure Pt is missing. Revision requested.</p> <p>Besides, section C states that Quality Assurance is with SLR Consulting Limited however, the company has not been included during this verification. Pls clarify.</p>								
Project participant response				Date: 30/05/2019				
<p>On page 12 of the MR a separate table has been added to include the downtimes for the calibration of the pressure transmitter.</p> <p>The information on the report has been updated to reflect that during this monitoring period quality control has been conducted by Jonathan Pass on the field and Claudia Barrera for documentation and calculations.</p>								
Documentation provided by project participant								
Revised MR version 2								
DOE assessment				Date: 02/07/2019				
<p>Section C has been updated and provides now a table including all down times during this monitoring period. However, clarification is requested w.r.t. provided dates for downtime of Pt as the following dates are given in MR section C:</p> <table border="1" data-bbox="148 1480 1161 1547"> <tr> <td>05/17/2017 at 10:24</td> <td>05/17/2017 at 11:29</td> </tr> <tr> <td>05/04/2017 at 09:37</td> <td>05/04/2017 at 13:36</td> </tr> </table> <p>05/17 seems to be not in line with UNFCCC date format and please clarify whether 05/04 is 5th April or 4th May.</p> <p>The reference to SLR Consulting has been corrected to John Pass and Claudia Barrera.</p>					05/17/2017 at 10:24	05/17/2017 at 11:29	05/04/2017 at 09:37	05/04/2017 at 13:36
05/17/2017 at 10:24	05/17/2017 at 11:29							
05/04/2017 at 09:37	05/04/2017 at 13:36							
Project participant response				Date: 20/08/2019				
<p>Dates on section C of the MR have been revised to have the correct format MM/DD/YYYY and to match the dates provided on site, as per the document submitted with the last response with name "Pressure Transmitter Downtimes.xls"</p>								
Documentation provided by project participant								
Revised MR version 3								
DOE assessment				Date: 21/08/2019				
<p>Ok. The MR has been updated accordingly and the dates are now consistent with the related provided supporting document and as crosschecked during onsite inspection.</p> <p>Finding closed.</p>								

CAR ID	03	Section no.	D.2	Date: 09/04/2019
Description of CAR				

<p>VCH_{4,t,db}:</p> <p>During onsite inspection it has been identified that the calibration gas used has an accuracy of 3% whereas the manufacturer requires a calibration gas of 2% to be used. Therefore, for the period from 01/10/2016 until 13/02/2018 a calibration gas with lower accuracy has been used to calibrate the CH₄ analyzer. Related revision has to be applied to consider the additional 1% inaccuracy in a conservative way for BE and PE. Further, the calibration date conducted for Handheld Instrument G500625 in 2018 is missing for completeness</p> <p>Op_{flare,h} and T_{EG,m}:</p> <p>The calibration validity for 3397086 and 3397088 as per manufacturer ends on 29/11/2016 whereas the thermocouple has been exchanged on 20/12/2016 only.</p> <p>Further, the MR provides the dates when the thermocouples have been exchanged and the period of use but not the dates of calibration and the end date of the validity. Only the very first calibration date is given. Pls specify.</p> <p>TDL_y:</p> <p>One value for transmission losses is given. As per onsite inspection ESKOM report 31 March 2018 as link given in MR also provides value for year 2017/18. MR to be updated w.r.t. latest values available and different values for each financial year as well as ER calculation to be adjusted w.r.t. related financial year of ESKOM 16/17 value for 01/04/2016 to 31/03/2017) and 17/18 value for 01/04/2017 to 31/03/2018. Further, it is to be clarified which value to be applied for the period 01/04/2018 until 30/06/2018 as the related ESKOM value is not available yet.</p>	
Project participant response	Date: 30/05/2019
<p>VCH_{4,t,db}:</p> <p>From period 01/10/2016 to 13/02/2018 a reduction of 1% on the Inlet CH₄ % has been applied to the monthly ER calculations. The BE were therefore reduced. The PE_{flare,y} was increased by 1% as a conservative measure to cater for the error in accuracy of the calibration gas. Values updated on the spreadsheets have been highlighted in yellow for easy reference. The information for calibration of the Instrument G500625 in 2018 has been included in the MR.</p> <p>Op_{flare,h} and T_{EG,m}:</p> <p>From period 29/11/2016 to 20/12/2016 the flare temperature was reduced by 3% as conservative correction for the missed calibration as this is the maximum tolerance of the thermocouples. This does not have an effect on the ER calculations as the temperatures during this period remains above 500 degrees Celsius. In addition the dates of calibration and validity have been added to the MR for all thermocouples.</p> <p>TDL_y:</p> <p>The TDL figures have been revised on page 31 of the MR as follows:</p> <p>Year 2016/2017, value 8.9 (1 April 2016 – 31 March 2017) Year 2017/2018, value 9.1 (1 April 2017 – 31 March 2018) Year 2018/2019, value not published yet, 9.1 used (conservative) These figures are found on page 142 of the 2018 Eskom Integrated Report, the 2019 Report has not been published yet.</p>	
Documentation provided by project participant	
Revised ER calculation sheets and Revised MR version 2	
DOE assessment	Date: 02/07/2019

$V_{CH4,t,db}$:

Ok. As per provided underlying monthly CDM Data spreadsheets, for the period 01/10/2016 – 13/02/2018 1% has been deducted from the value of parameter $V_{CH4,t,db}$ and 1% has been added to the project emissions from flaring. Data in ER spreadsheet is consistent with data as per provided monthly CDM data spreadsheets. Further, the MR has been updated by providing a related statement. Dates for handheld Instrument G500625 have been provided and are correct as per checked calibration certificates.

$Op_{flare,h}$ and $T_{EG,m}$

Ok. The values for the related period from 29/11/2016 to 20/12/2016 have been adjusted (reduced) in the monthly CDM data spreadsheets. However, as the temperature in this period was continuously above 500°C and is after the adjustment no change in the final ER result has appeared. Besides, the missing information e.g. validity, calibration has been provided now in MR. The information given in MR is now in line with instructions to fill MR.

TDL_y :

Ok. Related TDL values as per ESKOM report have been applied for the periods for which ESKOM published the values. ESKOM values are for the period 1st April of a year to 31st March of the following year. Accordingly the TDL value has been applied. This is considered correct and adequate. Further, the higher of the two values for the last two years available has been applied for the period starting 1st April 2018 as no related value is currently available. ESKOM did not publish their report as of now. FAR is raised that the DOE verifying subsequent monitoring period may check whether the actual value used would lead to a lower ER result and consider this during next verification.

$V_{LFG,sent flare,y,db}$:

Related parameter is missing in Section D.2 of MR.

Project participant response	Date: 17/10/2019
Included	
Documentation provided by project participant	
<i>Revised ER calculation sheets and MR version 4</i>	
DOE assessment	Date: 18/10/2019
Related missing parameter has been provided now. As all issues have been resolved this finding is closed.	

CAR ID	04	Section no.	ER calc	Date: 09/04/2019
Description of CAR				
Following issues w.r.t. ER calculation have been identified:				
<ol style="list-style-type: none"> Summary: During crosscheck of electricity consumption and generation it has been identified that for the months of April 2018 (411,925 kWh and 33,945 kWh) and August 2017 (535,243 kWh and 26,629 kWh) the ER spreadsheet provides zero whereas there was generation and consumption. Summary: Inconsistency has been identified between ER spreadsheet and electricity bills for the generation data of month October 2016 Processed data: Units are missing for the parameters. 				
Project participant response				Date: 30/05/2019
All revisions made to ER calculation sheets as per the comments above. Revisions to the months of April 2018 and August 2017 lead to an increase in ERs that offset the reduction applied due to missed calibration and conservative reductions from CAR3, with total ERs of 79,106 In addition units have been added to all Processed data worksheets.				
Documentation provided by project participant				
<i>Revised ER calculation sheets and MR version 2</i>				
DOE assessment				Date: 05/07/2019
<ol style="list-style-type: none"> Ok. As per corrected monthly CDM Data spreadsheet for the April 2018 and August 2017 the related electricity consumption and generation has been considered now. Ok. Values are now consistent between documents. Ok. All spreadsheets show now related units for parameters. However, it has been identified in the raw data files that for some times in January 2017 the parameter OP_{engine} is set to zero but $BE_{EC,y}$ is calculated. 				
Project participant response				Date: 06/04/2020

As mentioned in the monitoring report, and as validated by the DOE all electricity values used to claim emission reductions are the ones reported and billed on the monthly invoice from the municipality, eThekweni. The values on the raw data files are only used to crosscheck those on the bills, but not to claim ERs.

For the specific month of January 2017, it was identified that for some brief minutes, even though the engine is turned off, there is a recording for BEEC, this could be explained because sometimes when the engine is off, it may still read flow and therefore BEEC readings will follow.

Even though these readings are not used to claim ERs, the PP has decided to discount the total tCO₂e that this discrepancy adds up to, from the invoiced electricity: 0.507 tCO₂e. Please find attached new version of the MR and Emission Reduction summary spreadsheets that acknowledge this reduction.

Documentation provided by project participant

Revised ER calculation sheets and MR version 4

DOE assessment

Date: 07/04/2020

DOE has checked all monthly raw data files and processed files and can confirm that the described issue is only appearing for the following times in January 2017:

Date	From	To
26.01.2017	09:11	09:15
	09:20	09:23
	09:27	09:38
	10:03	10:06
	10:16	10:34
	10:48	11:09
30.01.2017	09:19	09:37
31.01.2017	14:39	15:07

In total the related calculated BE_{EC,y} from the above stated periods sum up to 0.507 tCO₂e or 0.488 MWh. However, as the value to calculate the baseline emissions from electricity generation exported to the grid is determined based on the monthly invoice by eThekweni meter section department the value from the raw data file is taken to crosscheck the value in the invoice. For January 2017 the total MWh-value of power generation in the invoice is 71.210 MWh resulting in 73.577 tCO₂e compared to the total value as per raw data which is 72.400 MWh equal to 74.807 tCO₂e. Even though considering the 0.507 tCO₂e the actual considered amount for this month is lower than that and therefore can be considered conservative 74.300 tCO₂e (74.807 – 0.507) vs 73.577 tCO₂e.

However, the PP has deducted this 0.507 tCO₂e from the BE_{EC,y} emission reduction calculation. For this the total emission reductions for this monitoring period are reduced from 79,106 tCO₂e to 79,105 tCO₂e. MR and Report have been also corrected accordingly and submitted along with this response.

As all issues have been resolved this finding is closed.

CAR ID	05	Section no.	E.1	Date: 09/04/2019
Description of CAR				
For BE calculation the MR states that for F _{CH4,PJ,y} and F _{CH4,flared,y} “an example using data from the month of January 2015” is provided. However, this month is prior to start date of this monitoring period. Pls clarify and revise accordingly. Also the related stated values are inconsistent with related raw data summary for this month.				
Project participant response				Date: 30/05/2019
The references to 2015 have been corrected on the revised MR version 2 to reflect January 2017, and the values match those reported on the CDM Data file for the correspondent month of January 2017.				
Documentation provided by project participant				
Revised MR version 2 and “CDM Data 2017_1.xls”				
DOE assessment				Date: 05/07/2019
Ok. The reference to January 2015 has been revised to “January 2017”. Data is consistent between MR and related ER spreadsheet and monthly CDM Data spreadsheet. Finding is closed.				

CAR ID	06	Section no.	General	Date: 09/04/2019
Description of CAR				
Following documents have to be provided: 1. Details for the N2 calibration gas bottle				
Project participant response				Date: 30/05/2019
N2 Information Certificate Provided.				

Documentation provided by project participant	
N2 Information Certificate.	
DOE assessment	Date: 05/07/2019
Ok. Related information for the N2 gas bottle has been provided the N2 purity is >99.99%. Finding is closed.	

Table 6. FAR from this verification

FAR ID	01	Section No.		Date: 05/07/2019
Description of FAR				
As for TDL no value for the period from 1 st April 2018 is available the highest of the two values from 16/17 and 17/18, 9.1% has been applied. The DOE verifying the next subsequent monitoring period may check whether the actual value used would lead to a lower ER result and consider this during its next verification.				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A. $QP_{y,monitored}$		Quantity of SiMn production		
<p>a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. 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/ /ACM1/ /TS/ /IM01/</p>	<p><i>Description:</i> The Volumetric flow of total landfill gas is monitored by flow meters. The total flow is determined by adding the two measured flows going to the flare and the engine. The two flow meters are of type E+H Proline t-mass 65i flowmeters are installed serial number: K3047D02000 and K3047E02000.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</p> <p><i>Conclusion:</i> The parameter has been monitored as per related monitoring plan and is correctly described in the related monitoring report.</p>	Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <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> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	Ok
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/>	No delayed calibration has occurred		
		<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.												
		<table border="1"> <tr> <td data-bbox="1023 258 1093 316"></td> <td data-bbox="1095 258 1841 316">permissible error of the instrument</td> </tr> <tr> <td data-bbox="1023 317 1093 438"><input type="checkbox"/></td> <td data-bbox="1095 317 1841 438">The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</td> </tr> <tr> <td data-bbox="1023 440 1093 529"><input type="checkbox"/></td> <td data-bbox="1095 440 1841 529">The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</td> </tr> <tr> <td data-bbox="1023 531 1093 588"><input type="checkbox"/></td> <td data-bbox="1095 531 1841 588">In this context the following findings have been raised:</td> </tr> <tr> <td data-bbox="1023 590 1093 632"><input type="checkbox"/></td> <td data-bbox="1095 590 1841 632">N/A</td> </tr> <tr> <td data-bbox="1023 633 1093 703"><input type="checkbox"/></td> <td data-bbox="1095 633 1841 703"></td> </tr> </table>		permissible error of the instrument	<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals	<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	N/A	<input type="checkbox"/>			
	permissible error of the instrument															
<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals															
<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.															
<input type="checkbox"/>	In this context the following findings have been raised:															
<input type="checkbox"/>	N/A															
<input type="checkbox"/>																
B. EC_y		Grid electricity consumption by the submerged electric arc furnace(s)														
<p>a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<p><i>Description:</i> The Volumetric flow of landfill gas flared is monitored by a flow meter. The related flow meter is of type E+H Proline t-mass 65i flowmeters with serial number: K3047D02000.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</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>Conclusion:</i></p> <p>The parameter has been monitored as per related monitoring plan and is correctly described in the related monitoring report.</p>			
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	Ok	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/>	No delayed calibration has occurred		
		<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
C. $Q_{pcoal,y}$		Consumption of coal used as reductant in the submerged electric arc furnace(s)			
a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<p><i>Description:</i> The Volumetric flow of landfill gas flared is monitored by a flow meter. The related flow meter is of type E+H Proline t-mass 65i flowmeters with serial number: K3047D02000.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems</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>occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</p> <p><i>Conclusion:</i> The parameter has been monitored as per related monitoring plan and is correctly described in the related monitoring report.</p> <table border="1"> <tr> <td><input type="checkbox"/></td><td>In this context the following findings have been raised:</td></tr> <tr> <td><input type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td></td></tr> </table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	N/A	<input type="checkbox"/>											
<input type="checkbox"/>	In this context the following findings have been raised:																	
<input type="checkbox"/>	N/A																	
<input type="checkbox"/>																		
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <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. 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. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /MM/ /MR/	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>For details regarding the accuracy and calibration details please refer to Appendix 6</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>No delayed calibration has occurred</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>As per the initial assessment the monitored value is deemed to be correct.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td></tr> <tr> <td><input type="checkbox"/></td><td>Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY</td></tr> <tr> <td><input type="checkbox"/></td><td>A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</td></tr> </table>	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input checked="" type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY	<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	Ok	OK
<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan																	
<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6																	
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<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:																	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
D. $Q_{\text{pcoke},y}$		Consumption of coke used as reductant in the submerged electric arc furnace			
a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. Assess whether the measurement / determination	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	Description: The temperature is monitored by temperature transmitter E+H Omnigrad TR 10 serial number: L203E994152. The temperature transmitter is located at the same position as the related flow meter. The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste		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>		<p>(DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet.</p> <p><i>Conclusion:</i> The measurement is in line with registered monitoring plan.</p> <table border="1"> <tr> <td><input type="checkbox"/></td><td>In this context the following findings have been raised:</td></tr> <tr> <td><input type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td></td></tr> </table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	N/A	<input type="checkbox"/>									
<input type="checkbox"/>	In this context the following findings have been raised:															
<input type="checkbox"/>	N/A															
<input type="checkbox"/>																
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /MM/ /MR/	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>For details regarding the accuracy and calibration details please refer to Appendix 6</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>No delayed calibration has occurred</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>As per the initial assessment the monitored value is deemed to be correct.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td></tr> <tr> <td><input type="checkbox"/></td><td>Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY</td></tr> </table>	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input checked="" type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY	Ok	OK
<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan															
<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6															
<input checked="" type="checkbox"/>	No delayed calibration has occurred															
<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.															
<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.															
<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY															

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<div>End date of delay: DD/MM/YYYY</div> <div> <input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the: <div> <input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration <input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument <input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument <input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals <input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. </div> </div> <div> <input type="checkbox"/> In this context the following findings have been raised: <div> <input type="checkbox"/> N/A <input type="checkbox"/> </div> </div>		
E. $Q_{ppaste,y}$		Consumption of electrode paste used as electrode in the submerged electric arc furnace		
a) Measurement / Determination method (VVS, §§ 389-393) 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	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<i>Description:</i> The pressure of the gaseous stream is monitored by pressure transmitter GE Sensing Druck PTX 7900-3399 Serial Number: SN 2765987 since 17/05/2016. The pressure transmitter is located at the same position as the related flow meter. The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On	Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		<div>monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</div> <div>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</div> <div>Verifier´s action: By check of MR, reg. PDD as well as onsite visit and technical data sheet.</div> <div>Conclusion: The parameter has been monitored as per related monitoring plan and is correctly described in the related monitoring report.</div> <div><div><input type="checkbox"/></div><div>In this context the following findings have been raised:</div><div><div><input type="checkbox"/></div>N/A</div><div><input type="checkbox"/></div></div>		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <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. 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</i>	/CAL/ /MM/ /MR/	<div><input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</div> <div><input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6</div> <div><input checked="" type="checkbox"/> No delayed calibration has occurred</div> <div><input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.</div> <div><input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for</div>	Ok	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>EB guidance.</i> Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		<input type="checkbox"/> this entire monitoring period.		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/> In this context the following findings have been raised:		
		<input type="checkbox"/> N/A		
<input type="checkbox"/>				
F. $EF_{coal,y}$		Emission factor applied for the coal consumed as reductant in year y		
a) Measurement / Determination method (VVS, §§ 389-393)	/IM01/ /PDD/	<i>Description:</i> The saturation pressure of the temperature Tt is determined from literature as it is solely a function of the gaseous	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>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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/ACM1/ /TS/ /IM01/	stream temp. Tt for a total pressure equal to 101,325 Pa.		
		The saturation pressure is only required in case the gas temperature increases above 60°C to determine the moisture content in the gas stream to calculate gas on dry basis.		
		The CDM data is checked if the temp is above or below 60°C. If Tt >60°C the saturation pressure is determined according to the related literature.		
		Please refer to the related parameter Tt on this is monitored.		
		<p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</p> <p><i>Conclusion:</i> DOE checked PDD and also by interview with PP and personnel on the monitoring of the value. Based on that DOE is of the opinion that the PP is aware of the procedure and determination method. As during this entire monitoring period the gas temperature did not exceed the threshold of 60°C it was not necessary to monitor this parameter. And hence ok.</p>		
	<input type="checkbox"/>	In this context the following findings have been raised:		
	<input type="checkbox"/>	N/A		
	<input type="checkbox"/>			
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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. 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</i></p>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/> No measurement equipment is involved as the value is determined from literature source.	Ok	OK
		<input type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred		
		<input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct. No measurement equipment is involved as the value is determined from literature source.		
		<input type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>EB guidance.</i> Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		<input type="checkbox"/> this entire monitoring period. No measurement equipment is involved as the value is determined from literature source.		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/> In this context the following findings have been raised:		
		<input type="checkbox"/> N/A		
<input type="checkbox"/>				
G. EF_{pcoke,y}		Emission factor applied for the coke consumed as reductant in year y		
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured /	/IM01/ /PDD/ /ACM1/	<i>Description:</i> The volumetric fraction of CH ₄ in a time interval t on a dry basis is monitored by CH ₄ measurement equipment type Edinburgh Instruments, Gascard NG, serial number: 6855.	CAR-3	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/TS/ /IM01/</p>	<p>The Gascard NG is located between the booster and the flare.</p> <p>Besides that the CDM operator uses a handheld gas analyzer of type Biogas 5000 from Geotech serial number G500625 and G500124. The handheld analyzer is used to check the methane quality at each well on a monthly basis and more frequent for new wells. This is done to operate the wells in a way to have a constant flow of constant methane content.</p> <p>The accuracy of the installed pressure transmitter is $\pm 2\%$ over the range.</p> <p>The Gascard NG is calibrated when delivered by the manufacturer. Please refer to Appendix 6 w.r.t. related calibration dates. The manufacturer their manual chapter 10 that the “sensor is inherently stable and will maintain its calibration over extended periods with minimal maintenance. We recommend that the calibration is checked every 12 months. Any adjustment required should be small.” Further as per manufacturer manual the following conditions apply for the calibration check:</p> <ul style="list-style-type: none"> - a zero calibration has to be conducted before a calibration against calibration gas and - the concentration of the calibration gas should be between 80% to 100% of either CO₂, CH₄ or CO and - the accuracy of the calibration gas should be of $\pm 2\%$ or better <p>However, as per letter by the manufacturer as the CH₄ content of the LFG is always around 52% it is also in line to use calibration gas representing their operation conditions. This might lead to a minimal higher inaccuracy at the top end of the range (100%) but as the CH₄ content never went beyond 60% this has no influence at all.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software “Historian”. On monthly basis the data is backed-up onsite on a hard drive and on</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.		
		Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.		
		Verifier’s action: By onsite visit, interview with CDM operator, check of notes in CDM data spreadsheet as well as reg PDD, MR and supporting documents such as calibration gas details.		
		Conclusion: The monitoring is in line with the monitoring plan. However, CAR 3 has been raised.		
		<div><div><input checked="" type="checkbox"/></div><div>In this context the following findings have been raised:</div></div>		
		<div><div><input checked="" type="checkbox"/></div><div>During onsite inspection it has been identified that the calibration gas used has an accuracy of 3% whereas the manufacturer requires a calibration gas of 2% to be used. Therefore, for the period form 01/10/2016 until 13/02/2018 a calibration gas with lower accuracy has been used to calibrate the CH4 analyzer. Related revision has to be applied to consider the additional 1% inaccuracy in a conservative way for BE and PE.</div></div>		
<div><div><input checked="" type="checkbox"/></div><div>Further, the calibration date conducted for Handheld Instrument G500625 in 2018 is missing for completeness</div></div>				
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) In case of measured (or estimated) values, check	/CAL/ /MM/ /MR/	<div><div><input type="checkbox"/></div><div>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</div></div>	CAR-3	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred		
		<input type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input checked="" type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Handheld analyzer Start date of delay: 05/02/2017 End date of delay: 15/02/2017		
		<input checked="" type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input checked="" type="checkbox"/> Even though the handheld analyser is not used to obtain directly monitoring data for emission calculation. It is used for checking the gas quality at the wells and field tests. As the Edinburgh Instruments, Gascard NG was in place during this entire monitoring period and duly calibrated as per related field checks there is no impact due to the delay in calibration of 10 days for the handheld analyser. And field checks have been conducted on 10/01/2017 and 24/02/2017 before and after the period and at times when the handheld was with its calibration validity.		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
			permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input checked="" type="checkbox"/>	In this context the following findings have been raised:		
		<input checked="" type="checkbox"/>	CAR 3: During onsite inspection it has been identified that the calibration gas used has an accuracy of 3% whereas the manufacturer requires a calibration gas of 2% to be used. Therefore, for the period from 01/10/2016 until 13/02/2018 a calibration gas with lower accuracy has been used to calibrate the CH4 analyzer. Related revision has to be applied to consider the additional 1% inaccuracy in a conservative way for BE and PE.		
H. EF_{ppaste,y}		Amount of electricity generated using LFG			
a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<i>Description:</i> The amount of electricity generated using LFG via the installed gas engine is monitored by an electricity meter of type Landis+Gyr, Serial Number: 50873189 for the main meter. Besides back-up meter is installed of the same type Serial Number: 50873185. The meter is a bi-directional meter measuring output and input electricity. The value for the amount of electricity generated is taken by a person from the meter section (department) every month online digital from the meter. The raw data is processed and the person from the meter section summarizes the input and output values for peak, standard time and off-peak periods in a pdf file. The pdf-file is forwarded to the related electricity engineer from the eThekweni (Durban) municipality. The eThekweni engineer inserts the values from the pdf file into an Excel template to calculate the related peak, standard and off-peak period kWh values and the amount in		CAR-4	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Rand respectively. In the Excel file the net generation is calculated by subtracting the input electricity from the output generated electricity by the project activity. Then the monthly spreadsheet is forwarded to the CDM operator (Envitech) an employee of the CDM operator inserts the respectively monthly value in their CDM Data spreadsheet. The CDM data spreadsheet is then forwarded to the PP (DSW) which again forwards the files to the Quality assurance/CDM Consultant who prepares the monitoring report.		
		<i>Verifier's action:</i> Onsite observation, interview with personnel, technical data sheet as well as MR and registered PDD. Checked the monthly Excel template against all monthly pdf files as well as the values inserted into the CDM Data spreadsheet.		
		<i>Conclusion:</i> Further as the above stated data aggregation and processing is laid down in related manuals e.g. step-by-step methodology DOE considers the measuring and monitoring of the value as in compliance with the monitoring plan. DOE has checked registered PDD and related South African Nation Standard (SANS) and can confirm that the standard requires a calibration frequency of every 10 years for project up to 10 MVA load. However, CAR 4 has been raised.		
		<div> <input checked="" type="checkbox"/> In this context the following findings have been raised: </div> <div> <div> <input checked="" type="checkbox"/> CAR 4: During crosscheck of electricity consumption and generation it has been identified that for the months of April 2018 (411,925 kWh and 33,945 kWh) and August 2017 (535,243 kWh and 26,629 kWh) the ER spreadsheet provides zero whereas there was generation and consumption. </div> <div> <input checked="" type="checkbox"/> CAR 4: Inconsistency has been identified between ER spreadsheet and electricity bills for the generation data of month October 2016 </div> </div>		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <i>In case of measured (or estimated) values, check</i>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	CAR-4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred		
		<input type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.				
<input checked="" type="checkbox"/> In this context the following findings have been raised:				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<div> <input checked="" type="checkbox"/> CAR 4 </div> <div> <input type="checkbox"/> </div>		
I. EC_{PJ,y}		Quantity of electricity consumed by the project activity during the year y		
<p>a) Measurement / Determination method (VVS, §§ 389-393) <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)). 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. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<p><i>Description:</i> The quantity of electricity consumed by the project activity is monitored by an electricity meter of type Landis+Gyr, Serial Number: 50710474.</p> <p>The value for the amount of electricity consumed is taken by a person from the meter section (department) every month online and digitally from the meter. The raw data is processed and the person from the meter section summarizes the input and output values for peak, standard time and off-peak periods in a pdf file. The pdf file is forwarded to the related electricity engineer from the eThekwin (Durban) municipality. The eThekwin engineer inserts the values from the pdf file into an Excel template to calculate the related peak, standard and off-peak period kWh values and the amount in Rand respectively. In the Excel file the net generation is calculated by subtracting the input electricity from the output generated electricity by the project activity. Then the monthly spreadsheet is forwarded to the CDM operator (Envitech) an employee of the CDM operator inserts the respectively monthly value in their CDM Data spreadsheet. The CDM data spreadsheet is then forwarded to the PP (DSW) which again forwards the files to the Quality assurance/CDM Consultant who prepares the monitoring report.</p> <p><i>Verifier's action:</i> Onsite observation, interview with personnel, technical data sheet as well as MR and registered PDD. Checked the monthly Excel template against all monthly pdf files as well as the values inserted into the CDM Data spreadsheet.</p> <p><i>Conclusion:</i> Further as the above stated data aggregation and processing is laid down in related manuals e.g. step-by-step methodology DOE considers the measuring and monitoring of the value as in compliance with the monitoring plan. DOE has checked</p>	CAR-4	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		registered PDD and related South African Nation Standard (SANS) and can confirm that the standard requires a calibration frequency of every 10 years for project up to 10 MVA load. However, CAR 4 has been raised.			
		<input checked="" type="checkbox"/>	In this context the following findings have been raised:		
		<input checked="" type="checkbox"/>	CAR 4: During crosscheck of electricity consumption and generation it has been identified that for the months of April 2018 (411,925 kWh and 33,945 kWh) and August 2017 (535,243 kWh and 26,629 kWh) the ER spreadsheet provides zero whereas there was generation and consumption.		
		<input checked="" type="checkbox"/>	CAR 4: Inconsistency has been identified between ER spreadsheet and electricity bills for the generation data of month October 2016		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <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> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	CAR-4	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/>	No delayed calibration has occurred		
		<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<div>related actions and therefore the DOE can confirm that the:</div> <div> <input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration </div> <div> <input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument </div> <div> <input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument </div> <div> <input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals </div> <div> <input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. </div> <div> <input checked="" type="checkbox"/> In this context the following findings have been raised: <div> <input checked="" type="checkbox"/> CAR 4 </div> <div> <input type="checkbox"/> </div> </div>		
J. Op_{engine,h}		Operation of the engine that consumes the LFG		
a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements.	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<i>Description:</i> The Operation of the engine that consumes the LFG is monitored via electricity meters as described above for parameter EG_{PJ,y} . The control box of the engine further sends a signal to the connected PLC. The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste	Ok	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.										
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		<p>(DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> by means of checking MR, reg PDD, methodology, tools as well as monthly meeting minutes, onsite visit and interviews conducted.</p> <p><i>Conclusion:</i> No mistakes have been identified by transferring the data. Further as the above stated data aggregation and processing is laid down in related manuals e.g. step-by-step methodology DOE considers the measuring and monitoring of the value as in compliance with the monitoring plan.</p> <table border="1"> <tr> <td><input type="checkbox"/></td><td>In this context the following findings have been raised:</td></tr> <tr> <td><input type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td></td></tr> </table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	N/A	<input type="checkbox"/>							
<input type="checkbox"/>	In this context the following findings have been raised:													
<input type="checkbox"/>	N/A													
<input type="checkbox"/>														
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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/ /MM/ /MR/	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>For details regarding the accuracy and calibration details please refer to Appendix 6</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>No delayed calibration has occurred</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>As per the initial assessment the monitored value is deemed to be correct.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td></tr> </table>	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input checked="" type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	Ok	OK
<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan													
<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6													
<input checked="" type="checkbox"/>	No delayed calibration has occurred													
<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.													
<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.													

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.	
Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration			
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument			
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument			
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals			
		<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.			
		<input type="checkbox"/> In this context the following findings have been raised:			
		<input type="checkbox"/> N/A			
		<input type="checkbox"/>			
K. Op_{flare,h}		Operation of the flare that consumes the LFG			
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	Description: The operation hours of the flare can be determined by following criterion: Op _{flare,h} = 0 when: Flame is not detected continuously in hour h (instantaneous measurements are made at least every minute);	CAR-3	Ok	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>Otherwise, $Op_{\text{flare},h} = 1$</p> <p>This is based on a thermocouple which monitors the flame temperature and SCADA system recognizes the temperature. The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>During this monitoring period the following thermocouples have been installed:</p> <ol style="list-style-type: none"> 1. SN 3397088 – 15/12/2015 to 20/12/2016 2. SN 33940967 – 20/12/2016 to 11/12/2017 3. SN 33940969 – 11/12/2017 to 30/06/2018 <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p>Besides the parameter could also be monitored via the flame detector installed.</p> <p><i>Verifier's action:</i> By means of checking MR, reg PDD, methodology, tools as well as monthly meeting minutes, onsite visit and interviews conducted.</p> <p><i>Conclusion:</i> The monitoring of the parameter is in line with the latest monitoring plan as well as methodology and tools. However, CAR 3 has been raised.</p> <p><input checked="" type="checkbox"/> In this context the following findings have been raised:</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
			<input checked="" type="checkbox"/> CAR 3: The calibration validity for 3397086 and 3397088 as per manufacturer ends on 29/11/2016 whereas the thermocouple has been exchanged on 20/12/2016 only. Further, the MR provides the dates when the thermocouples have been exchanged und the period of use but not the dates of calibration and the end date of the validity. Only the very first calibration date is given. Pls specify.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <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> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	CAR-3	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input type="checkbox"/>	No delayed calibration has occurred		
		<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 30/11/2016 End date of delay: 20/12/2016		
		<input checked="" type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input checked="" type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.										
<p><i>used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>were the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By means of checking MR, reg PDD, methodology, tools as well as monthly meeting minutes, onsite visit and interviews conducted.</p> <p><i>Conclusion:</i> The monitoring of the parameter is in line with the latest monitoring plan as well as methodology and tools.</p> <table border="1"> <tr> <td><input type="checkbox"/></td><td>In this context the following findings have been raised:</td></tr> <tr> <td><input type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td></td></tr> </table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	N/A	<input type="checkbox"/>							
<input type="checkbox"/>	In this context the following findings have been raised:													
<input type="checkbox"/>	N/A													
<input type="checkbox"/>														
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <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. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring</i></p>	/CAL/ /MM/ /MR/	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>For details regarding the accuracy and calibration details please refer to Appendix 6</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>No delayed calibration has occurred</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>As per the initial assessment the monitored value is deemed to be correct.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>Based on calibration certificates checked it can be confirmed</td></tr> </table>	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input checked="" type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed	Ok	OK
<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan													
<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6													
<input checked="" type="checkbox"/>	No delayed calibration has occurred													
<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.													
<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed													

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>		<input type="checkbox"/> that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/> In this context the following findings have been raised:		
		<input type="checkbox"/> N/A		
<input type="checkbox"/>				
M. T_{EG,m}		Temperature in the exhaust gas of the enclosed flare in minute m		
a) Measurement / Determination method (VVS, §§ 389-393)	/IM01/ /PDD/	<i>Description:</i> The temperature of the exhaust gas is monitored by a thermocouples of type "Type N Thermocouple Probe" serial	CAR-3	Ok

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<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)). 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. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/ACM1/ /TS/ /IM01/	<p>numbers</p> <ol style="list-style-type: none"> 1. SN 3397088 – 15/12/2015 to 20/12/2016 2. SN 33940967 – 20/12/2016 to 11/12/2017 3. SN 33940969 – 11/12/2017 to 30/06/2018. <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p>		
		<p><i>Verifier's action:</i> By means of checking MR, reg PDD, methodology, tools as well as monthly meeting minutes, onsite visit and interviews conducted.</p>		
		<p><i>Conclusion:</i> The monitoring of the parameter is in line with the latest monitoring plan as well as methodology and tools. However, CAR 3 has been raised.</p>		
		<p><input checked="" type="checkbox"/> In this context the following findings have been raised:</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
			<input checked="" type="checkbox"/> CAR 3: The calibration validity for 3397086 and 3397088 as per manufacturer ends on 29/11/2016 whereas the thermocouple has been exchanged on 20/12/2016 only. Further, the MR provides the dates when the thermocouples have been exchanged und the period of use but not the dates of calibration and the end date of the validity. Only the very first calibration date is given. Pls specify.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) <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> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	CAR-3	Ok
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input type="checkbox"/>	No delayed calibration has occurred		
		<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 30/11/2016 End date of delay: 20/12/2016		
		<input checked="" type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input checked="" type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input checked="" type="checkbox"/>	The result of the delayed calibration did not identify an		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
			<div>error beyond the maximum permissible error of the instrument</div> <div><input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument</div> <div><input checked="" type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</div> <div><input checked="" type="checkbox"/> The error has been applied to all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</div> <div><input checked="" type="checkbox"/> In this context the following findings have been raised:<div><input checked="" type="checkbox"/> CAR 3: The calibration validity for 3397086 and 3397088 as per manufacturer ends on 29/11/2016 whereas the thermocouple has been exchanged on 20/12/2016 only. Further, the MR provides the dates when the thermocouples have been exchanged und the period of use but not the dates of calibration and the end date of the validity. Only the very first calibration date is given. Pls specify.</div></div>		
N. TDL _y		Average technical transmission and distribution losses in the grid in year y for the voltage level at which electricity is obtained from the grid at the project site.			
<p>a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of</p>	<p>/IM01/ /PDD/ /ACM1/ /TS/ /IM01/</p>	<p><i>Description:</i> The average technical transmission losses in the connected grid are monitored via publication by the grid operator during this monitoring period via:</p> <p>Value of average transmission losses from the South African national electricity utility, Eskom Integrated Report 2018, Ten-Year Technical Statistics, page 142, available at http://www.eskom.co.za/IR2018/Documents/Eskom2018IntegratedReport.pdf.</p> <p>The CDM operator is checking on annual basis the latest available</p>		<p>CAR-3 FAR</p>	<p>Ok FAR</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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>value for transmission losses and updates the related CDM Data spreadsheet. The updated information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By means of checking the related internet webpage of the power supplier ESKOM as well as ER spreadsheet, PDD and MR.</p> <p><i>Conclusion:</i> The value is derived correctly and correctly applied. However CAR 3 has been raised. Besides, a FAR Has been raised as latest value is not available yet.</p> <p><input checked="" type="checkbox"/> In this context the following findings have been raised:</p> <p><input checked="" type="checkbox"/> One value for transmission losses is given. As per onsite inspection ESKOM report 31 March 2018 as link given in MR also provides value for year 2017/18. MR to be updated w.r.t. latest values available and different values for each financial year as well as ER calculation to be adjusted w.r.t. related financial year of EKSOM 16/17 value for 01/04/2016 to 31/03/2017) and 17/18 value for 01/04/2017 to 31/03/2018. Further, it is to be clarified which value to be applied for the period 01/04/2018 until 30/06/2018 as the related ESKOM value is not available yet.</p>		
<p>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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</i></p>	/CAL/ /MM/ /MR/	<p><input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</p> <p><input type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6</p>	CAR 3	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 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><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input checked="" type="checkbox"/> No delayed calibration has occurred. No measurement equipment is involved in the monitoring of this value as it is derived from a document downloaded from the internet		
		<input type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period. No measurement equipment is involved in the monitoring of this value as it is derived from a document downloaded from the internet		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals				
<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input checked="" type="checkbox"/>	In this context the following findings have been raised:		
		<input checked="" type="checkbox"/>	CAR 3		
O. Management of SWSD		Management of SWSD			
a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	<p><i>Description:</i> The parameter is monitored by site records.</p> <p>The records and information is collected by the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p><i>Verifier's action:</i> By onsite observation, interview with PP and personnel as well as check of records and landfill development plan.</p> <p>The Management of the SWDS is operated under defined conditions. As per interview with PP and landfill operator the management and filling is conducted in the same fashion since the beginning e.g. a layer of waste is dumped and covered by a thin layer of soil. This has been checked from the Environmental audit report conducted twice a year. The audit report shows how the landfill is operated and even provides pictures. Further a list of waste amount dumped during 2016, 2017 and for 2018 up to date of onsite inspection has been provided including also types of waste dumped.</p> <p><i>Conclusion:</i> Based on the report provided as well as by onsite check the management of the SWDS has not changed due to the implementation to the project activity.</p>		Ok	Ok
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)	/CAL/ /MM/	<input checked="" type="checkbox"/>	No measurement equipment is involved in the monitoring of this value as it is derived from a document downloaded from	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> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/MR/	the internet		
		<input type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred. No measurement equipment is involved in the monitoring of this value as it is derived from a document downloaded from the internet		
		<input type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period. No measurement equipment is involved in the monitoring of this value as it is derived from a document downloaded from the internet		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<div> <input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration <input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument <input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument <input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission </div>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
P. BE_{CH4}, SWDS,y		Methane generation from the landfill in the absence of the project activity at year y			
a) Measurement / Determination method (VVS, §§ 389-393) 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 frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /PDD/ /ACM1/ /TS/ /IM01/	Description: Not applicable as this parameter is only relevant during RfReg to determine the ex-ante amount of methane generated from the landfill. Thereafter the actual amount of methane destroyed will be directly monitored. Verifier's action: By check of PDD and related methodology and tool. Conclusion: Monitored in line with methodology and tool as well as latest monitoring plan.		Ok	Ok
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) 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	/CAL/ /MM/ /MR/	<input checked="" type="checkbox"/>	N/A	Ok	OK
		<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input type="checkbox"/>	No delayed calibration has occurred.		
		<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.										
<p><i>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><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.												
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY												
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the: <table border="1" data-bbox="1093 619 1839 1150"> <tr> <td data-bbox="1093 619 1167 746"><input type="checkbox"/></td> <td data-bbox="1173 619 1839 746">The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration</td> </tr> <tr> <td data-bbox="1093 751 1167 842"><input type="checkbox"/></td> <td data-bbox="1173 751 1839 842">The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument</td> </tr> <tr> <td data-bbox="1093 847 1167 938"><input type="checkbox"/></td> <td data-bbox="1173 847 1839 938">The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument</td> </tr> <tr> <td data-bbox="1093 943 1167 1066"><input type="checkbox"/></td> <td data-bbox="1173 943 1839 1066">The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</td> </tr> <tr> <td data-bbox="1093 1070 1167 1150"><input type="checkbox"/></td> <td data-bbox="1173 1070 1839 1150">The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</td> </tr> </table>			<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration	<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals	<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.
		<input type="checkbox"/>			The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration									
		<input type="checkbox"/>			The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument									
		<input type="checkbox"/>			The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument									
		<input type="checkbox"/>			The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals									
		<input type="checkbox"/>			The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.									
		<input type="checkbox"/> In this context the following findings have been raised:												
		<input type="checkbox"/>			N/A									
<input type="checkbox"/>														

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Electricity meter (main)	EG _{PJ,y}	50873189	Landis+Gyr	0.5%	18/06/2014	-	17/06/2024	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Electricity meter (back-up)	EG _{PJ,y}	50873185	Landis+Gyr	0.5%	18/06/2014	-	17/06/2024	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Electricity meter	EC _{PJ,y}	50710474	Landis+Gyr	1.0%	17/06/2014	-	16/06/2024	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Thermocouple	T _{EG,m}	3397088	Type N Thermocouple	0.75%	30/11/2015	Replaced 20/12/2016	29/11/2016	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 30/11/2016 To: 20/12/2016
		33940967			05/12/2016	Replaced 11/12/2017	04/12/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		33940969			05/12/2016	Used until end of MP Replaced 13/12/2018	04/12/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		33959480			24/05/2018 (outside monitoring period)	Current in use	23/05/2021	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

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Monitorin equipmen	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accur acy or accura cy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Thermoco uple	OP _{flare,h}	3397086	Type N Thermoco uple	0.75%	30/11/2015	Replaced 20/12/2016	29/11/2016	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 30/11/2016 To: 20/12/2016
		33940968			05/12/2016	Replaced 11/12/2017	04/12/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		33940970			05/12/2016	Used until end of MP Replaced 13/12/2018	04/12/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		33959478			24/05/2018	Currently in use, installed 13/12/2018	23/05/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Pressure transmitte r	P _t	2765987	GE Sensing Druck PTX 7900- 3399	±0.25 %	17/05/2016 (date of installation)	17/05/2017 17/05/2018	16/05/2017 16/05/2018 16/05/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Calibratio n gas	VCH _{4,t,db}	12381513	CH ₄ , CO ₂ and N ₂	3%	13/02/2016	-	13/02/2017	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		845940		3%	13/02/2017	-	13/02/2018	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		2845974		2%	13/02/2018	-	13/02/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
CH ₄ analyzer	VCH _{4,t,db}	6855	Edinburgh Instrumen ts Gascard NG	+/- 2.0%	15/10/2014 (factory) 11/08/2016 (Field calcs)	 09/11/2016 10/01/2017	14/10/2015 10/08/2017 08/11/2017 09/01/2018	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

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Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
						24/02/2017 24/03/2017 05/04/2017 03/05/2017 01/06/2017 13/07/2017 16/08/2017 15/06/2018	23/02/2018 23/03/2018 04/04/2018 02/05/2018 31/05/2018 12/07/2018 15/08/2018 14/06/2019		
CH4 analyzer	VCH4,t,db	G500625	Handheld Instrument Biogas 5000	+/- 0.94%	05/02/2016	02/02/2015 15/02/2017 14/01/2018	04/02/2017 14/02/2018 13/01/2019	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	05/02/2017 – 15/02/2017
		G505124			02/01/2018	-	01/01/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Flow meter	V _{LFG,total,y,db} V _{LFG,sent flare,y,db} V _{LFG,EL,y,db}	K3047D02000 K3047E02000	Endress & Hauser Proline t-mass 65i	±4%	23/06/2016	01/06/2017 30/05/2018	22/06/2017 31/05/2018 29/05/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Temperature transmitter	T _t	L203E994152	E&H Omnicard TR10	Maximum error 0.35°C	-	n.a. as per manufacturer specifications	-	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN); • Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		